Modality in Luhya: A typological study

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1 Introduction[1]

- We give a preliminary typology of modals (e.g. English *might, must, should, perhaps*) across six Luhya languages: Llogoori, Lubukusu, Lunyore, Lusaamia, Lutiriki, and Luwanga.[2,3]

- Luhya is a subfamily of Bantu, consisting of 18 languages spoken in western Kenya and northwestern Tanzania. There are approximately 5 million speakers in the Luhya subfamily (Lewis et al., 2016).

- Our data comes from original fieldwork in the United States and Kenya, and was collected using a modified version of Vander Klok (2014)'s modal fieldwork questionnaire.

- We situate our findings within the modal typology of van der Auwera and Plungian (1998) and Nauze (2008), as well as traditional Kratzerian modal semantics.

- We show that there is a core set of modal verbs shared across the Luhya languages. These verbs are generally **lexically specified for modal force, but underspecified with respect to modal flavor**.

- We additionally show that Luhya modal verbs have a rich set of inflectional and derivational affixes that contribute to the core modal meaning expressed by the verb. These affixes are subject to both inter-language and inter-speaker variation.

[2]These languages are referred to by a number of different names. Lubukusu is also called Bukusu, Llogoori is also called Logooli, Luragooli, Maragoli, and Lulogooli, among others; Lutiriki is also called Tiriki, and Luwanga is also called Wanga.

[3]When presenting data, we will use the following abbreviations to refer to the source language: LG = Llogoori, LB = Lubukusu, LN = Lunyore, LS = Lusaamia, LT = Lutiriki, LW = Luwanga.

1.1   Brief background on modality

- We assume the definitions of modal force and modal flavor initially given by Kratzer (1981) and Kratzer (1991).

- **Modal force** concerns whether the modal describes a possibility (existential force), or a necessity (universal force).

  - English possibility modals: *might, may, perhaps*
  - English necessity modals: *must, have to*
  - English "weak necessity" modals: *should, probably*

- **Modal flavor** concerns what body of knowledge the speaker uses to evaluate the modal.

  - **Epistemic** modals are compatible with the speaker's facts about the world, whether stemming from evidence, belief, knowledge, or so on
  - **Deontic** modals are compatible with laws, rules, regulations, and so on
  - **Circumstantial** modals are compatible with the facts of the world
  - **Teleological** modals are compatible with someone's goals

- We also refer to the tripartite modal classification that is made by some descriptive modal typologies, but is not typically referred to in the theoretical semantic literature on modality (van der Auwera and Plungian 1998, Nauze 2008).

- In addition to **epistemic modality**, which is defined similarly to Kratzer (1991), van der Auwera and Plungian (1998) distinguish between **participant-internal and participant-external modality**.

  - **Participant-internal (PI) modality** refers to the possibility or necessity internal to the participant, e.g. their ability or internal need.

    (1)   Boris <u>can</u> swim.   PI, ABILITY

    (2)   Boris <u>needs</u> to sleep ten hours a night.   PI, NECESSITY

  - **Participant-external (PE) modality** refers to circumstances that are external to the participant that make the state of affairs possible or necessary. This category is subdivided into **deontic** PE modality (expressing permission or obligation) (3), and **goal-oriented** (teleological) PE modality (4).

    (3)   a.   You <u>may</u> speak now.   PE, DEONTIC POSSIBILITY

          b.   You <u>have to</u> leave now.   PE, DEONTIC NECESSITY

    (4)   a.   To get downtown, you <u>can</u> take the 720 bus.

                                                      PE, GOAL-ORIENTED POSSIBILITY

          b.   To get downtown, you <u>must</u> take the 720 bus.

                                                      PE, GOAL-ORIENTED NECESSITY

Participant internal	Participant-external		Epistemic
	Deontic	Goal-oriented	
Ability	Permission	Possibility	Possibility
Need	Obligation	Necessity	Necessity

Table 1: Modal typology from Nauze (2008).

- We collected our Luhya data following a modified version of Vander Klok (2014)'s modal fieldwork questionnaire. This questionnaire assumes the distinctions made by Kratzer (1991) and Kratzer (1981). It probes whether (Kratzerian) modal force and flavor are lexically specified in the language of study, and if so, how.

- The questionnaire provides contexts and then asks the consultant how to appropriately translate a sentence containing the target modal, given the context.

- Previous work has shown that some languages' modals only mark force (English; von Fintel 2006), whereas others only mark flavor (St'át'imcets; Rullmann et al. 2008). Others are argued to be underspecified for both force and flavor (Washo; Bochnak 2015), or mark both force *and* flavor (Paciran Javanese; Vander Klok 2014).

2   Core data: cross-linguistic similarities

2.1   Modal verbs

- The languages in our survey all use a core set of three verbs to express a range of modal meanings; we classify these into Class I, II, and III.[4]

- The following table gives a cross-linguistic inventory of the three modal verbs arranged according to modal force and flavor as defined by Kratzer (1991). In this table, we present the verbs in their infinitival form (i.e, with a class 15 infinitival prefix). Many of these verbs can combine with a number of suffixes, an issue we do not address here.[5]

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[4]Bantu verbs can be highly morphologically complex. Minimally, they obligatorily host a prefix marking the person/number or noun class of the subject and a suffix marking tense/mood (here referred to as FV 'final vowel'). They can also host optional suffixes (called "extensions") marking reciprocals, reflexives, causatives, anticausatives, and so on.

[5]We follow typical Bantuist transcription conventions. *kh* represents a voiceless velar fricative, *n'n* represents a geminate *n*, *ng'* represents a velar nasal, and *ny* represents a palatal nasal. We use β to represent a voiced bilabial fricative.

Modal use	Class I ≈Possibility:	Class II ≈Weak necessity:	Class III ≈Necessity & WN:
Non-modal use	'to manage [to do ...]'	'to want'	'to arrive'/'to reach'
Llogoori	*kunyala*	*kwenya*	*kuduka*
Lubukusu	*khunyala*	*khwenya*	*kwenyekha/khoya*
Lunyore	*okhunyala*	*okhwenya*	*okhwola*
Lusaamia	*kunyala*	*kwenya/kudakha*	*kukhoyera*
Lutiriki	*khunyala*	*khwenya*	*khutukha*
Luwanga	*okhunyala*	*okhwenya*	*okhula*

Table 2: Cross-linguistic inventory of modal verbs.

- (5)-(7) show examples of these verbs in their non-modal uses in Llogoori. From here on, we gloss the modals, even in their non-modal use, as MOD.I, MOD.II, and MOD.III.

(5) **Class I**[6]

Sira   ya-nyal-a   mu mipango jije
1Sira 1-MOD.I-FV in   4goal   4his
'Sira succeeded in his goals.'   (LG)

(6) **Class II**

n-eny-a   mabarabandi
1SG-MOD.II-FV 5loquat
'I want a loquat.'   (LG)

(7) **Class III**

Sira   a-duk-i   kutura Nairobi.
1Sira 1-MOD.III-FV from   Nairobi
'Sira arrived from Nairobi.'   (LG)

- (8)-(10) shows basic examples of modal uses of each verb in Llogoori:

(8) **Class I**

Sira   a-nyal-a   a-tem-ɛ   msaara
1Sira 1-MOD.I-FV 1-cut-SBJV 6tree
'Sira might/may cut the tree down.'   (LG)

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[6]We use the following abbreviations in this handout:

1-20: noun class	COP : copula	PROG : progressive
1/2/3: 1st/2nd/3rd person	FUT : future	PRT : particle
I, II, III: modal class	FV : final vowel	REC : reciprocal
AC : anticausative	ID : ideophone	SBJV : subjunctive
APPL : applicative	NEG : negative	SG/PL: singular/plural
CAUS: causative	POSS : possessive	

(9) **Class II**

Sira y-eny-ek-a a-sav-ɛ amwaavo
1Sira 1-MOD.II-AC-FV 1-ask-SBJV 1brother
'Sira should ask his brother (to borrow his bike).' (LG)

(10) **Class III**

vaandu ku-duka va-ivik-ɛ ihelmet
2person 15-reach 2-wear-SBJV 9helmet
'People must wear a helmet (because it's the law).' (LG)

- The Class I and II modals in (8)-(9) are in their "raised" form: the modal agrees in noun class/person with the subject. (See Mountjoy-Venning and Diercks 2016 for discussion of raising in Llogoori.)

- Class III modals typically occur in their infinitival form with the class 15 prefix (in Llogoori, ku-; this morpheme has cognates across the languages). Neither class I nor class II can similarly appear in this uninflected form in any of the languages.

- The embedded verb in (8)-(10) is always in the subjunctive mood, as diagnosed by the final verbal suffix -ɛ. The phonological shape of this subjunctive morpheme is the same across all six languages.

- In the following sections, we will outline the range of meanings that each class of modal verbs can express.

2.1.1 Class I modals

- Class I modals can express **all modal categories of possibility/existential force**.

| | Participant internal ability | Participant-external | | Epistemic possibility |
		deontic poss.	goal-oriented poss.	
Lubukusu: khunyala	✓	✓	✓	✓
Llogoori: kunyala	✓	✓	✓	✓
Lunyore: okhunyala	✓	✓	✓	✓
Lusaamia: kunyala	✓	✓	✓	✓
Lutiriki: khunyala	✓	✓	✓	✓
Luwanga: okhunyala	✓	✓	✓	✓

Table 3: Modal uses of Class I verbs.

- The following data shows examples of the range of modal categories available for Llogoori kunyala and Lunyore okhunyala. For the contexts used to elicit each example, see the Appendix.

(11) **Llogoori**

    a.   *Imaali a-nyal-a   ku-koba ndumba*
        1Imali 1-MOD.I-FV 15beat 9drum
        'Imaali can (knows how to) play the drum.'   (PI ABILITY)

    b.   *u-nyal-a   ku-zia mugati*
        2SG-MOD.I-FV 15go 3room
        'You may go in the room.'   (PE DEONTIC POSSIBILITY)

    c.   *u-nyal-a   ku-vogola matatu*
        2sg-MOD.II-FV 15-take   matatu
        'You can take a matatu (to get to the market).' (PE GOAL-ORIENTED POSS.)

    d.   *professor   a-nyal-a   ku-za   mu kilasi karono*
        1professor 1-MOD.I-FV 15-come in 7class today
        'The professor might come to class today.'   (EPISTEMIC POSSIBILITY)

(12) **Lunyore**

    a.   *Amisi   a-nyal-a   okhu-teek-a amandazi*
        1Amisi 1-MOD.I-FV 15-cook-FV 6mandazi
        'Amisi can cook mandazi.'   (PE POSSIBILITY/PI ABILITY)

    b.   *u-nyal-a   okhu-injil-a*
        2SG-MOD.I-FV 15-enter-FV
        'You may enter.'   (PE DEONTIC POSSIBILITY)

    c.   *professor   a-nyal-a   okhu-itsa ng'ondi*
        1professor 1-MOD.I-FV 15-come today
        'The professor might come today.'   (EPISTEMIC POSSIBILITY)

2.1.2 Class II modals

- In general, Class II modals generally express **(weak) necessity (WN)** (i.e. something slightly weaker than universal force). They express strong necessity only in the case of participant internal modality. Class II modals are used for both **participant-internal and participant-external modality**, but not epistemic modality (with one exception).

- Question marks in the table below indicate that we do not yet have evidence that the given lexical item isn't used for that category. We will indicate that the lexical item is unable to mark a given category with a ✘ only if we have negative evidence showing that this is the case.

	Participant internal necessity	Participant-external		Epistemic necessity/WN
		deontic WN	goal-oriented WN	
Lubukusu: *khwenya*	✓	✓	✓	✓
Llogoori: *kwenya*	✓	✓	✓	✗
Lunyore: *okhwenya*	✓	✓	✓	?
Lusaamia: *kwenya,*	✓	✓	✓	?
kudakha	✓	✓	✓	?
Lutiriki: *khwenya*	✓	✓	✓	✗
Luwanga: *okhwenya*	✓	✓	✓	?

Table 4: Modal uses of Class II verbs

- Class II modals are used without the **anticausative** marker (-*ek/-ekh*) (see Gluckman & Bowler (forthcoming)) when expressing participant-internal modality.[7]

- The following data shows the range of modal categories available for Luwanga *okhwenya* and Lusaamia *kwenya/kudakhikha*.[8]

(13) **Luwanga**

a. *n-eny-a   okhusumula*
    1sg-MOD.II-FV 15sneeze

    'I need to sneeze.'   (PI NECESSITY)

b. *fi-eny-ekh-a   Osundwe   a-saaβ-e   msiami   waβu indike*
    8-MOD.II-AC-FV 1Osundwe 1-ask-SBJV 3brother 3his 9bike

    'Osundwe should borrow a bike from his brother.'   (PE DEONTIC WN)

c. *y-eny-ekh-a   o-βukhul-e   matatu*
    9-MOD.II-AC-FV 2sg-take-SBJV 6matatu

    'You should take a matatu (to get to the market).'

                                                     (PE GOAL-ORIENTED WN)

(14) **Lusaamia**

a. *n-eny-a   okhwinyala*
    1sg-MOD.II-FV 15.pee

    'I have/need to pee.'   (PI NECESSITY)

b. *vi-dakh-ikh-an-a   Wabwire   a-saav-e   omusiamo waβwɛ endika*
    8-MOD.II-AC-REC-FV 1Wabwire 1-ask-SBJV 3brother   3his   9bike

    'Wabwire should ask his brother for the bike.'   (PE DEONTIC WN)

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[7]Lubukusu is an exception in this regard, as it permits the anticausative when expressing participant-internal necessity.

[8]Lusaamia *kudakhikha* and *kwenya* appear to share the same semantic space. Note that there is a cognate verb for *kudakhikha* in the other Luhya languages; it means 'to desire' in those languages.

c.   *vi-dakh-ikh-an-a   o-vukul-e   matatu*
8-MOD.II-AC-REC-FV 2sg-take-SBJV 6matatu

'You should take a matatu (to get to the market).'

(PE GOAL-ORIENTED WN)

2.1.3   Class III modals

- Class III modals generally express **all modal categories of necessity/universal force**. These are typically the strongest modals of the three classes.

	Participant internal necessity	Participant-external		Epistemic necessity
		deontic nec.	goal-oriented nec.	
Lubukusu: *khoya*	✓	✓	✓	✓
Llogoori: *kuduka*	✓	✓	✓	✓
Lunyore: *okhwola*	✓	✓	✓	✓
Lusaamia: *kukhoyera*	?	✓	✓	✓
Lutiriki: *khutukha*	✓	✓	✓	✓
Luwanga: *okhula*[9]	✓	✓	✓	✓

Table 5: Modal uses of Class III verbs

- The following data shows the range of modal flavors available for Lubukusu *khoya* and Llogoori *kuduka*.[10]

(15)   **Lubukusu**

a.   *∅-khoy-el-a   ni-inyal-ɛ   buubi po*
1SG-MOD.III-APPL-FV 1SG-pee-SBJV very   ID

'I really have to pee.'   (PI NECESSITY)

b.   *o-khoy-el-a   o-fwal-ɛ   kukofia*
2SG-MOD.III-APPL-SBJV 2SG-wear-FV helmet

'You must wear a helmet.'   (PE DEONTIC NECESSITY

c.   *o-khoy-el-a   o-bukul-ɛ   endeke yino*
2SG-MOD.III-APPL-SBJV 2SG-take-FV 9flight 9this

'You have to take this flight (to get to Kisumu).'

(PE GOAL-ORIENTED NECESSITY)

d.   *efula a-khoy-a   khu-ba nekwa*
9rain 9-MOD.III-FV 15-COP fall

'It must be raining.'   (EPISTEMIC NECESSITY)

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[9]In Luwanga, *okhula* typically co-occurs with the necessity adverbial *mpaka*. We return to this lexical item later.

[10]We only have examples of Lubukusu *khoya* co-occurring with the applicative *-el* suffix to express PI necessity and PE goal-oriented necessity.

(16) **Llogoori**

    a.   *ku-duk-a   nzi yashambul-ɛ*
         15-MOD.III I   sneeze-SBJV
         'I have to sneeze.'   (PI NECESSITY)

    b.   *ku-duk-a   w-evek-ɛ   igudwe*
         15-MOD.III-FV 2SG-wear-SBJV 9helmet
         'You must wear a helmet.'   (PE DEONTIC NECESSITY)

    c.   *AFC   ku-duk-a   e-leg-ɛ   Gor   Mahia*
         1AFC 15-MOD.III-FV 9-beat-SBJV 1Gor Mahia
         'AFC must beat Gor Mahia (to advance in the tournament).'
                                          (PE GOAL-ORIENTED NECESSITY)

    d.   *(ku-duk-a)   mbura (ku-duk-a)   e-v-ɛ   neekuba*
         15-MOD.III-FV 9rain   15-MOD.III-FV 9-COP-SBJV falling
         'It must be raining.'   (EPISTEMIC NECESSITY)

- Class III is the only modal category that can be used in its infinitival form (i.e, hosting the class 15 prefix *ku-*). We return to this topic in subsection 4.3.

- Furthermore, we observe that when it occurs in its infinitival form, the class III modal can appear either before or after the nominal subject, as in (16d).

3   Verbal modals from a typological perspective

- The Luhya modals map onto the typology proposed by Nauze (2008) as follows:

Participant internal	Participant-external		Epistemic
	Deontic	Goal-oriented	
Ability	Permission	Possibility	Possibility
Need	Obligation	Necessity	Necessity

Table 6: Modal typology from Nauze (2008) with Luhya modal classes I, II, and III overlaid.

- **Class I modals** **express all categories of ability, permission, and possibility** (i.e., existential force modality).

- **Class II modals** **express participant-internal need and participant-external obligation and necessity**, but not epistemic necessity.

- **Class III modals** **express all categories of need, obligation, and necessity** (i.e., universal force modality).

- The overlap between Class II and Class III generally reduces to weak vs. strong universal force.

– Weak deontic obligation is expressed using Class II, but strong deontic obligation is expressed using Class III.

– Likewise, weak goal-oriented necessity is expressed using Class II, but strong goal-oriented necessity is expressed using Class III.

– There is no verbal distinction between weak and strong epistemic necessity. (Adverbs can be used to express such meanings.)

– It's unclear to us whether there is a meaning difference between class II and class III for participant-internal modality.

• In general, our findings support the typology proposed by Nauze in that:

1. The typology appears to capture all the modal uses in across the languages.

2. Luhya modals only vary along one "axis." They have **fixed force**, but **may express different categories (in Kratzerian terminology, flavors)**.

3. The modals **obey the "no-skipping" constraint** proposed by Nauze. For example, there is no modal that expresses participant-internal modality and goal-oriented modality, but does not also express deontic modality.

• Our study also shows that **volitional modality**, which is typically (purposefully) omitted from modal typologies, plays an important role in the Luhya modal system. We see this in the Class II modal, which functions in its non-modal use as the verb used to express desires.

– The null hypothesis is that the non-modal and modal pairs each share a common semantics associated with the verb root. Depending on the structure the root appears in, it will either have a non-modal or modal meaning.

• Interestingly, not all of the modals in each class appear to be historically related across all six languages. For instance, Llogoori and Lutiriki use *kuduka* and *khutukha* as their class III modals, respectively, which do not resemble any of the other languages' modals in that class. Nonetheless, these verbs still have the same non-modal meanings as the other class III modals ('to arrive'/'to reach').

• In Lusaamia, the verb *kudakha* is the most natural way to express desires ('to want'). This verb is also frequently used as the Lusaamia class II modal.

– This suggests to us that the semantic space occupied by each class is relevant for the modal meaning.

3.1   Non-verbal modals

• In addition to the set of modal verbs described in 2.1, all of the languages in our survey also have a number of non-verbal modals.

• Unlike the verbs, these non-verbal modals do not inflect for noun class, person/number, or tense/aspect.

- We divide this class of non-verbal modals into **adverbial modals**, **non-inflecting modals**, and **complement taking elements**. We postpone discussion of the complement taking elements until section 4.2.

  – **Adverbial modals:**

    * The adverbial modals can occur at different locations within the clause, typically sentence-initially or immediately preceding the verb.

    (17) **Llogoori**
          (haonde) Sira   (haonde) y-a-zi-a   Nairobi
          maybe   1Sira maybe   1-ASP-go-FV 1Nairobi
          'Maybe Sira went to Nairobi.'   (EPISTEMIC POSSIBILITY)

    * All languages in our survey have a cognate form of *haonde*.
    * Adverbial modals can only express **epistemic possibility**.

  – **Non-inflecting modals:**

    * These elements distribute like adverbs, but they require that the main verb be in the subjunctive mood, marked by the -ɛ final vowel.[11]
    * The non-inflecting modals include items like *(m)paka*.

    (18) **Tiriki**
          mpaka shipaka shi-v-ɛ   irwanyi
          must   7cat   7-COP-SBJV outside

          'The cat must be outside.'   (EPISTEMIC NECESSITY)

    (19) **Lusaamia**
          paka w-efwak-ɛ   ihelmet
          must 2SG-wear-SBJV 9helmet

          'You must wear a helmet.'   (PE DEONTIC NECESSITY)

    * In its infinitival form, the class III modal behaves identically to non-inflecting modals in that it also requires that the main verb be in the subjunctive mood.

- In the following table, we show the forms of the epistemic possibility and necessity adverbial/non-inflecting modals across the six languages:

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[11]Note that subjunctive mood is not generally licit in matrix clauses, suggesting that there is some level of subordination with the non-inflecting modals.

	Epistemic possibility ('maybe')	Epistemic necessity ('must')
Lubukusu	*aundi*	*paga*(?)
Llogoori	*haunde*	*mpaka*
Lunyore	*haonde*	*mpaka*
Lusaamia	?	*paka*
Lutiriki	*haundi*	*mpaka*
Luwanga	*aundi*	*paka*

Table 7: Cross-linguistic inventory of two non-verbal modals.

3.1.1 Modal borrowings

(m)paka

- With the possible exception of Lubukusu, all of the languages in our survey have borrowed the lexical item *(m)paka* from Swahili, with various phonological changes.

- *(m)paka* has universal force. It seems to have stronger modal force than the class III modal, although speakers sometimes report that these two items are interchangeable.

- This lexical item can occur clause-initially, or precede the verb:

(20)   **Llogoori**
    (mpaka) Hungary   (mpaka) va-leg-ε   Portugal
    must   1Hungary must   2-beat-FV 1Portugal
    'Hungary must beat Portugal (to advance in the tournament).'[12]

                                                    (PE GOAL-ORIENTED NECESSITY)

- In Lutiriki, this lexical item is demonstrated to have weaker modal force than in the other languages. Lutiriki consultants give *mpaka* in response to weak necessity prompts, although speakers of other languages in our study report that *(m)paka* is too strong in these contexts:

(21)   a.   **Lutiriki**
             Kageha   mpaka   a-ve   mu ofisi   sahi
             1Kageha must/should 1-COP in   office now
             'Kageha must/should be at the office now.'   (EPISTEMIC NECESSITY)

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[12]Speakers use noun class 2 in this sentence (indicating a plurality of humans) because they use the term *Hungary* to refer to the team of players.

b.   **Luwanga**

 # Kageha   paka a-li   mu ofisi   bulano
1Kageha must 1-COP in   office now

'Kageha must be at the office now.'   (EPISTEMIC NECESSITY)
Intended: 'Kageha should be at the office now.'

- Curiously, this lexical item is also used to express the preposition 'until' in all of the languages in our survey, as well as in Swahili.

(22)   **Llogoori**

Imali   a-maamer-i mkopo mpaka ne   gu-bam-ek-a
1Imali 1-pound-FV 3can   until   COP 3-flat-AC-FV

'Imali pounded the can until it was flat.'

lazima

- Several languages in our study (at least Lubukusu, Llogoori, and Lutiriki) have borrowed the lexical item *lazima*. This is used to mark necessity in the languages in our study, as well as in Swahili.

  – This word is etymologically from Arabic; stress placement in Lubukusu suggests that *lazima* might not be a borrowing from Swahili, but instead directly from Arabic.

(23)   **Lutiriki**

(lazima) shipaka (lazima) shi-ve irwanyi
must   7cat   must   7-COP outside

'The cat must be outside.'   (EPISTEMIC NECESSITY)

- We believe that the borrowings reflect the fact that "absolute" necessity (i.e., the strongest necessity) is *ineffable* in standard Luhya. Speakers generally report that the class III modal is weaker than either *(m)paka* and *lazima*. That is, the lexical item with the strongest force across Luhya cannot express "absolute" necessity. Thus, to assert this meaning, the Luhya languages have borrowed lexical items from other languages.

4   Variation

- While all three modal classes are shared across the languages in our study, we find a great deal of inter- and intra-speaker variation.

- While some differences occur between different languages (e.g. the presence/absence of a complement taking modal), there is also some intra-speaker variation within the same language (e.g. the use of multiple expletive subject agreement morphemes in Llogoori and Luwanga).

4.1 "Expletive" subject agreement

- The languages in our survey differ in the number of **expletive subject agreements** that they permit.

- Expletive subject agreement is a subject marker on the verb used to indicate an expletive or pleonastic subject, i.e., a non-referential subject (English: *It might be raining*).

- This is a point of inter-language variation, in that some languages have larger/smaller sets of expletives. There is also inter-speaker variation, in that not all speakers of a single language agree on the number of expletives that the language has.

  – In the table below, bolded expletives are ones accepted by all speakers of the given language.

	Expletive subject agreements	Total #
Lubukusu	*li-* **(class 5)**, *ka-* **(class 6)**, *e-* **(class 9)**	3
Llogoori	*ga-* **(class 6)**, *e-* (class 9)	2
Lunyore	*ka-* **(class 6)**	1
Lusaamia	*vi-* **(class 8)**	1?
Lutiriki	*ka-* **(class 6)**, *e-* **(class 9)**	2
Luwanga	*li-* (class 5), *ka-* (class 6), *fi-* **(class 8)**, *i-* **(class 9)**	4

Table 8: Variation in expletive subject agreements.

- In Llogoori, the choice of *e-* (class 9) versus *ga-* (class 6) can reflect a number of different meanings, including e.g. the speaker's indirect versus direct perception of the embedded proposition, less versus more emotional affectedness on the part of the speaker, or restricted versus general knowledge, among other things (Gluckman and Bowler 2016).

- The choice of expletive agreement can also differentiate between weak and strong modality.

(24) **Llogoori**

    a. *e-duk-an-a   ndee u-zi-ɛ   mskolu*
        9-MOD.III-REC-FV that 2sg-go-SBJV in.school

        'You should go to school.'   (PE DEONTIC WN)

    b. *ga-duk-an-a   ndee u-zi-ɛ   mskolu*
        6-MOD.III-REC-FV that 2sg-go-SBJV in.school

        'You must go to school.'   (PE DEONTIC NECESSITY)

- We are unsure what distinctions the expletive agreements make in the other languages. This remains a major topic for future research.

4.2   Complement taking elements

- In addition to the previously described inventory of modals, most of the languages in our study also employ clause-initial particles that do not inflect, but take subjunctive complements and generally carry necessity modal semantics.

- We give an example of this particle in Lusaamia below; at present, we are unsure how to gloss it. We give examples of these particles cross-linguistically in the following table.

(25)   **Lusaamia**

    a.   *viri mbwe/inga   w-efwal-ɛ   ihelmet*
          ??   COMP/COMP 2SG-wear-FV 9helmet
          'You must wear a helmet.'   (PE DEONTIC NECESSITY)

    b.   *viri sa   mbwe m-bukul-ɛ   ndege ino*
          ??   just COMP 1SG-take-FV 9flight 9this
          'I just have to take this flight.'   (PE GOAL-ORIENTED NECESSITY)

	Complement taking particle	Strength
Lubukusu	*bele*	necessity
Llogoori	*naare*[13]	possibility
Lunyore	?	
Lusaamia	*viri*	necessity
Lutiriki	*kabidi*	necessity
Luwanga	*fili/kali*	necessity

Table 9: Cross-linguistic inventory of complement taking modal particles.

- Note that these are distinct from the non-inflecting modals and adverbials in that they may only appear in a clause-initial position and that they may co-occur with a complementizer, as in (25a).

4.3   Infinitival class III modals ('to arrive'/'to reach'/'must')

- All the languages permit their class III modal to be used in its infinitival form, in combination with a class 15 agreement prefix.

- Only Llogoori and Lutiriki permit their class III modal (*kuduka* and *khutukha*, respectively) to be used with expletive subject agreement.

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[13]Llogoori's *naare* is at least superficially decomposable into a form of the copula. This is not at least transparently true of the complement-taking modals in the other languages, though it is possible that they are also morphologically complex.

(26) **Llogoori**

   a.   *ku-duka Sira a-z-ɛ   Nairobi*
       15-reach 1Sira 1-go-FV 1Nairobi
       'Sira must go to Nairobi.'   (PE DEONTIC NECESSITY)

   b.   *ga-duk-an-a   Sira a-z-ɛ   Nairobi*
       6-reach-REC-FV 1Sira 1-go-FV Nairobi
       'Sira must go to Nairobi.'   (PE DEONTIC NECESSITY)

(27) **Lutiriki**

   a.   *khu-tukha u-vukul-ɛ   indeche iyi*
       15-reach   2SG-take-FV 9flight 9this
       'You have to take this flight.'   (PE GOAL-ORIENTED NECESSITY)

   b.   *ka-tukh-an-a   u-vukul-ɛ   indeche iyi*
       6-reach-REC-FV 2SG-take-FV 9flight 9this
       'You have to take this flight.'   (PE GOAL-ORIENTED NECESSITY)

- There appear to be semantic differences between the inflected forms and the infinitival forms in Llogoori and Lutiriki, but the distinction needs to be explored more thoroughly.

5 Conclusion

- We conclude from this preliminary study that the Luhya languages share a core strategy for encoding modal distinctions, which is subject to inter-language variation to express finer modal distinctions.

- From a Kratzerian perspective, the data suggest that Luhya verbal modals, like English modals, are lexically specified for force, but compatible with a number of different flavors.

- From a typological perspective, the modals categories across Luhya neatly map onto the typology established by Nauze (2008) and van der Auwera and Plungian (1998), differentiating between participant internal, participant external, and epistemic categories ("flavors"), as well as between possibility and necessity forces.

- Further similarities are in the adverbial and non-inflecting modals (including the modal borrowings).

- The points of variation are a) expletive agreement, which appears to be able to further restrict modal meanings; b) complement taking modals, which appear to be highly idiosyncratic across languages in phonological form; and c) the availability of a finite class III modal.

- Moreover, variation exists in the inflectional and derivational affixes that further restrict the core meaning. These include expletive subjects, applicatives, reciprocals, and anticausatives. We leave these for future work.

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Appendix

The following sections provide context(s) for each modal category, and a standard utterance for the given context. We have not yet been able to collect utterances for each context in every language. At present, only our Llogoori data is complete.

Most of the contexts are directly taken or adapted from Vander Klok (2014). When necessary, we slightly altered Vander Klok's contexts to more culturally appropriate scenarios. We also changed the names in Vander Klok's contexts to commonly used names in each language.

Finally, we note that the interlinear glosses for the following data are still a work in progress. Comments and corrections are welcome.

5.1   Epistemic possibility

*Kageha's professor is not dependable. The students never know if he's going to come to give the lecture or not. Today, it's time to start class and the students are waiting again. The professor **might** come to class today.*

(28)   **Llogoori**
  professor   a-nyal-a   ku-za   mu kilasi karono
  1professor 1-MOD.I-FV 15-come in   7class today
  'The professor might come to class today.'

(29)   **Lunyore**
  professor   a-nyal-a   okhu-its-a   n'nondi
  1professor 1-MOD.I-FV 15-come-FV today
  'The professor will probably come today.'

(30)   **Lubukusu**
  omweekesi a-nyal-a   kw-eech-a   mu-kilasi luuno
  1professor 1-MOD.I-FV 15-come-FV 17-7class today
  'The professor might come to class today.'

(31)   **Luwanga**
  Namatsi   y-anyal-a   khu-its-a
  1Namatsi 1-MOD.I-FV 15-come-FV
  'Namatsi might come.'

(32)   **Lutiriki**
  professor   a-nyal-a   khu-iits-a   mwiisoomera nuundina
  1professor 1-MOD.I-FV 15-come-FV to.class   today?
  'The professor might come to class today.'

(33)   **Lusaamia**
  professor   a-nyal-a   okhu-ich-a   nyanga ino
  1Professor 1-MOD.I-FV 15-come-FV today   this?
  'The professor might come today.'

5.2   Epistemic necessity

*Kageha is in the library. She sees that the people who are coming into the library are carrying wet umbrellas, and that their clothes are wet. She also knows that it is currently the rainy season. Kageha thinks: It **must** be raining.*

(34)   **Llogoori**
       (ku-duk-a)   mbura (ku-duk-a)   e-v-ɛ   neekuba
       (15-MOD.III-FV) 9rain   (15-MOD.III-FV) 9-COP-FV beating
       'It must be raining.'

(35)   **Lunyore**
       mpaka ifula e-v-e   ne   khwitsaang'ga (esiooba)
       must   9rain 9-COP-FV COP falling   (outside)
       'It must be raining (outside).'

(36)   **Lubukusu**
       efula   a-khoy-a   khu-ba nekwa
       9raining 9-MOD.III-FV 15-COP falling
       'It must be raining.'

(37)   **Luwanga**
       mpaka/khu-ol-a   ifula i-kwits-ang'g-a
       must/15-MOD.III-FV 9rain 9-fall?-PROG-FV
       'It must be raining.'[14]

(38)   **Lutiriki**
       imbula laazima i-v-ɛ   i-khuv-ang'g-a
       9rain   must   9-COP-FV 9-beat?-PROG?-FV
       'The rain must be raining.'

(39)   **Lusaamia**
       efula o-khoy-er-a   nga   e-kw-a
       9rain 15-MOD.III-APPL-FV COMP? 9-fall-FV
       'It must be raining.'

5.3   Weak epistemic necessity

*Sira works everyday. But you know that his mother sometimes comes to town to visit, and when she does, he doesn't go to work. You're pretty sure that his mother hasn't come to town, so when someone asks you where Sira is, you say Sira **should** be at work right now.*

(40)   **Llogoori**
       Sira ku-duk-a   naave   ku   gaasi
       1Sira 15-MOD.III-FV 1-COP-FV being at   ?work
       'Sira should be at work.'

---

[14]The availability of both of these utterances is not confirmed.

(41) **Lunyore**

mpaka Atichi   a-b-e   naare khu kaasi
must   1Atichi 1-COP-FV being at   work

'Atichi must be at work.' ("I'm pretty sure")

(42) **Lubukusu**

Kageha   a-khoy-el-a   a-b-e   siamilimo
1Kageha 1-MOD.III-APPL-AC 1-COP-FV 7work

'Kageha should be at work

(43) **Luwanga**

Sira   o-khul-a   a-b-ɛ   khumilimo bulano buno
1Sira 15-MOD.III-FV 1-COP-FV 17?work   time? this?

'Sira should be at work right now.'

(44) **Lutiriki**

khu-tukh-a   Sira   a-v-ɛ ku   kaasi isai
15-MOD.III-FV 1-SC-ɛ at   work now

'Sira should be at work right now.'

*Portugal is playing Hungary in a football match. Because you follow football, you know that Portugal is a better team; therefore, Portugal **should** beat Hungary.*

(45) **Lusaamia**

Portugal   e-khoy-er-a   i-hir-ɛ
9Portugal 9-MOD.III-APPL-FV 9-win?-FV

'Portugal should win.'

5.4   Deontic possibility

*According to the rules of the hospital, only family members are allowed to enter the patient's room during visiting hours. You came to visit your sister, but it was after visiting hours. However, the nurse gives you permission to see her, anyway. She says, "You **may** go in."*

(46) **Llogoori**
u-nyar-a   ku-zia mu
2SG-MOD.I-FV 15-go in
'You may go in.'

(47) **Lunyore**
u-nyal-a   okhu-injila
2SG-MOD.I-FV 15-enter
'You can enter.'

(48) **Lubukusu**
o-nyal-a   w-ach-a   mukari
2SG-MOD.I-FV 2SG-go-FV 3room
'You may go into the room.'

(49) **Luwanga**
o-nyal-a   okhu-injela
2SG-MOD.I-FV 15-enter
'You may enter.'

(50) **Lutiriki**
u-nyal-a   khu-tsya mukarhi
2SG-MOD.I-FV 15-go   3room
'You can go in the room.'

(51) **Lusaamia**
o-nyal-a   o-chal-i   rina
2SG-MOD.I-FV 2SG-go?-FV when
'You may go in.'[15]

5.5 Deontic necessity

*In Kenya, the law states that when you ride a motor bike, you **should** wear a helmet.*

(52) **Llogoori**
ku-duk-a   w-evek-a   igudwe
15-MOD.III-FV 2SG-wear-FV 9helmet
'You must wear a helmet.'

(53) **Lunyore**
mpaka/okhu-ol-a   w-evikh-ε   ihelmet
must/15-MOD.III-FV 2SG-wear-FV 9helmet
'You must wear a helmet.'[16]

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[15]The speaker was adamant that *rina* 'when' is necessary here.
[16]The availability of both of these utterances is not confirmed.

(54) **Lubukusu**
o-khoy-el-a   o-fwal-ɛ   kukofia
15-MOD.III-APPL-FV 2SG-wear-FV helmet
'You must wear a helmet.'

(55) **Luwanga**
mpaka/khul-a   o-fwal-ɛ   ihelmet
must/15-MOD.III-FV 2SG-wear-FV 9helmet
'You must wear a helmet.'

(56) **Lutiriki**
mpaka w-ifwal-ɛ   ikofya
must   2SG-wear-FV 9helmet
'You must wear a helmet.'

(57) **Lusaamia**
o-khoy-er-a   w-efwal-ɛ   ihelmet
15-MOD.III-APPL-FV 2SG-wear-FV 9helmet
'You must wear a helmet.'

5.6   Weak deontic necessity

*Sira wants to go to town, but he doesn't have a bike. He wants to borrow his brother's bike, and he thinks that he could do so without his brother knowing, but <u>he **should** ask his brother for the bike.</u>*

(58) **Llogoori**
ga-eny-ek-a   Sira a-sav-ɛ amwaavo
6-MOD.II-AC-FV 1Sira 1-ask-FV 1brother
'Sira should ask his brother.'

(59) **Lunyore**
ka-eny-ekh-ang'-a   Atichi a-sab-ɛ Weche   indika
9-MOD.II-AC-PROG-FV 1Atichi 1-ask-FV 1Weche 9bike
'It would be nice if Atichi asks Weche for the bike.'

(60) **Luwanga**
Osundwa y-eny-ekh-a   a-saab-ɛ msiami   waβu indiki
1Osundwa 1-MOD.II-AC-FV 1-ask-FV 1brother 1his   9bike
'Osundwa is supposed to ask his brother for the bike.'

(61) **Lusaamia**
vi-dakh-ikh-an-a   Wabwire   a-saav-ɛ omusiamo waβwe endika
8-desire-AC-REC-FV 1Wabwire 1-ask-FV 1brother   his   9bike
'Wabwire should ask his brother for the bike.'

*You want to go on a hike that crosses a farmer's property. You think that you could hike across their farm without them noticing, but it would be more polite if you asked them for permission first. <u>You **should** ask the farmer to walk through their land.</u>*

(62) **Lubukusu**

w-eny-ekh-an-ɛ   o-sab-ɛ   balimi   nio o-kend-ɛ   mu bulime mwabwe
2SG-MOD.II-AC-REC-FV 2SG-ask-FV 1farmer if? 2SG-walk-FV in   3land   3his
'You should ask the farmer if? you might walk on his land.'

(63) **Lutiriki**

khu-tukh-a   u-rhev-ɛ murimi munwa kwa   khu-chend-a murimi.
15-MOD.III-FV 2-ask?-FV 1farmer 3mouth in.order.to 15-walk-FV 3land
'You should the farmer permission to walk his land.'

5.7   Circumstantial possibility

*Imali knows how to make mandazi (fried dough balls). When she travels overseas, she likes to make mandazi for the people she visits, so she can show them a common food from Kenya. Imali is in Canada right now. She goes to the grocery store and picks up the ingredients. Now, Imali **can** make mandazi.*

(64) **Llogoori**

sasa Imali a-nyal-a   ku-roomba mandazi
now 1Imali 1-MOD.I-FV 15-make   6mandazi
'Now Imali can make mandazi.'

(65) **Lunyore**

Amisi   a-nyal-a   okhu-teeka amandazi
1Amisi 1-MOD.I-FV 15-cook   6mandazi
'Amisi can cook mandazi.'

(66) **Lubukusu**

Imali a-nyal-a   ku-tekha mandasi   biise bino
1Imali 1-MOD.I-FV 15-cook 6mandazi ?time ?this
'Imali can make mandazi now.'

(67) **Luwanga**

Imali a-nyal-a   okhu-tekha amandasi bulano
1Imali 1-MOD.I-FV 15-cook   6mandazi now?
'Imali can make mandazi now.'

(68) **Lutiriki**

Imali   a-nyal-a   khu-tekha mandasi.
1Imali 1-MOD.I-FV 15-cook   6mandazi
'Imali can make mandazi.'

(69) **Lusaamia**

Nabwire a-nyal-a   o-deha   mandasi
Nabwire 1-MOD.I-FV 15-cook mandazi
'Nabwire can cook mandazi.'

5.8   Circumstantial necessity

*You are on a bus to Nairobi. You have not had a chance to go to the toilet for 6 hours, and your bladder is full. You text your friend: "I **have to** pee so badly!"*

(70)   **Llogoori**
       ku-duk-a   nzi-nyal-ε
       15-MOD.III-FV 1SG-urinate-FV
       'I have to pee.'

(71)   **Lunyore**
       n-eny-a   okhu-tsia okhu-inyala
       1SG-MOD.II-FV 15-go   15-pee
       'I want to go pee.'[17]

(72)   **Lubukusu**
       ∅-khoy-el-a   ni-inyale buubi po
       1SG?-MOD.III-APPL-FV 1SG-pee very   ID
       'I really have to pee.'

(73)   **Luwanga**
       paka nd-inyal-ε
       must 1SG-pee-FV
       'I must pee.'

(74)   **Lutiriki**
       ka-tukh-an-a   nd-inyar-ε vutamanu sana
       6-MOD.III-REC-FV 1SG-pee-FV badly?   very
       'I must pee very badly.'

(75)   **Lusaamia**
       n-eny-a   okhu-inyala
       1SG-MOD.II-FV 15-pee
       'I have/need to pee.'

*You have to sneeze, and want to be polite. You say, "Excuse me! I **have to** sneeze."*

(76)   **Luwanga**
       o-khula   nd-asumul-ε
       15-MOD.III 1-sneeze-FV
       'I have to sneeze.'

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[17]We note that this data is consistent with other Lunyore modal data; however, the use of the two embedded infinitival verbs is unusual.

5.9 Teleological necessity

*There is only one flight a day from Nairobi to Kisumu. So, <u>if you want to fly to Kisumu today,</u> you **have to** take this flight.*

(77) **Llogoori**
ni u-eny-ɛ   ku-zia Kisumu, ku-duka u-niin-ɛ   indege eye
if 2SG-MOD.II-FV 15-go 1Kisumu, 15-reach 1SG-take-FV 9flight 9this
'If you want to go to Kisumu, you must take this flight.'

(78) **Lunyore**
okhu-ol-a   o-tsi-ɛ   nende na   indege ino
15-MOD.III-FV 2SG-go-FV with   PRT 9flight 9this
'You must take this flight.'

(79) **Lubukusu**
o-khoy-el-a   o-bukul-ɛ   endeke yino
2SG-MOD.III-APPL-FV 2SG-take-FV 9flight 9this
'You must take this flight.'

(80) **Lutiriki**
ka-tukh-an-a   u-vukul-ɛ   indeche iyi.
6-MOD.III-REC-FV 2SG-take-FV 9flight 9this
'You must take this flight.'

(81) **Lusaamia**
o-khoy-er-a   m-bukul-ɛ   indege ino
15-MOD.III-APPL-FV 1SG-take-FV 9flight 9this
'I must take this flight.'

*AFC Leopards and Gor Mahia (two football teams) are playing in the group stage of a football tournament. In order for AFC to advance, they need three points (a win) in the next game against Gor Mahia. Otherwise, they will be eliminated from the tournament. You say, <u>"AFC **must** defeat Gor Mahia."</u>*

(82) **Llogoori**
AFC   ku-duk-a   va-leg-ɛ   Gor   Mahia
1AFC 15-MOD.III-FV 2-beat-FV 1Gor Mahia
'AFC must defeat Gor Mahia.'

(83) **Lunyore**
mpaka Gor   Mahia ba-lek-ɛ   AFC   Leopards
must   1Gor Mahia 2-defeat-FV 1AFC 1Leopards
'Gor Mahia must defeat AFC Leopards.'

(84) **Luwanga**
o-khul-a   AFC   i-khup-ɛ   Gor   Mahia
15-MOD.III-FV 1AFC 1-beat-FV 1Gor Mahia
'AFC must beat Gor Mahia.'

(85) **Lusaamia**
o-khoy-er-a   khu-hin-ɛ   Gor   Mahia
15-MOD.III-APPL-FV 1PL-beat-FV 1Gor Mahia
'We have to beat Gor Mahia.'

5.10   Weak teleological necessity

There are three markets close to where Maina is staying in Kisumu. Sira tells him that the market to the east is the cheapest, the market to the west is the most expensive, and the market to the south has the fewest vendors. According to Sira, the eastern market is the best. So to get the best groceries, Maina should go to the market to the east. Since that market is far away, Sira says, <u>*"You **should** take a matatu."*</u>

(86) **Llogoori**

w-eny-ek-a   o-niin-ɛ   matatu
2SG-MOD.II-AC-FV 2SG-take-FV matatu

'You need to take a matatu.'

(87) **Lunyore**

ka-eny-ekh-a   o-niin-ɛ   matatu
6-MOD.II-SC-FV 2SG-take-FV matatu

'You should take a matatu.'

(88) **Lubukusu**

khu   khu-ol-a   khusoko Vihiga, w-eny-ekh-a   o-bukul-ɛ   ematatu
in.order.to 15-MOD.III-FV market? Vihiga, 2-MOD.II-SC-FV 2SG-take-FV 9matatu

'To get to Vihiga's market(?), you should take a matatu.'

(89) **Luwanga**

fi-eny-ekh-an-a   a-vukul-ɛ matatu
8-MOD.II-AC-REC-FV 1-take-FV matatu

'He should take a matatu.'

(90) **Lutiriki**

khu-tukh-a   iVihiga ka-eny-ekh-a   u-vukul-ɛ   matatu
15-MOD.III-FV 9Vihiga 6-MOD.II-AC-FV 2SG-take-FV matatu

'You should take a matatu.'

(91) **Lusaamia**

vi-dakh-ikh-an-a   o-vukul-ɛ   matatu
8-desire-AC-REC-FV 2SG-take-FV matatu

'You should take a matatu.'