

The syntax and semantics of Passamaquoddy-Wolastoqey modals*

Peter Grishin (MIT) – grishin@mit.edu

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1 Introduction

- ♦ **The primary goal:** investigate the **syntax** and **semantics** of **four of the most common modals in Passamaquoddy-Wolastoqey** (PW; Eastern Algonquian), both descriptively and theoretically, providing a solid foundation for further work in this domain.

(translations below are from the online dictionary and language portal: <https://pmportal.org>)

- ▶ *kis(i)*- (preverb, initial): **be able to, can**
- ▶ (*ah*)*cuw(i)*- (preverb, initial): **must, have to; should, ought to; need to**¹
- ▶ *cipotu(k)* (particle): **maybe, perhaps; it is possible that...**
- ▶ *cu-al-lu* (particle): **(guessing, deducing) must be, probably**²

- ♦ **The secondary goals:**

- ▶ contribute to a **formal typology of modality**;

(Nauze 2008, Rullmann et al. 2008, von Stechow and Iatridou 2008, Deal 2011, Matthewson 2013, Vander Kloek 2013, Bochnak 2015, Yanovich 2016, Cable 2017, Chen et al. 2017, Chen 2018, Gluckman and Bowler 2020, Vander Kloek and Hohaus 2020, Jeretič 2021, a.o.)

- ▶ verify various theoretical claims about the syntax and semantics of modals—such as their **position in the clausal spine**, how they **interact with tense**, and how they **interact with negation**.

(Cinque 1999, Condoravdi 2002, Hacquard 2006, 2009, 2010, Homer 2011, 2013, 2015, Iatridou and Zeijlstra 2013, Chen et al. 2017, Rullmann and Matthewson 2018, Jeretič 2021, Staniszewski 2021, 2022, Jeretič and Thoms 2023, a.o.)

**Pol nkoti-wolasuweltomuwak psi-te wenik etolokehkimihitit 'tolatuwewakonuwawa: Margaret Apt, Edwina Mitchell, Grace Paul, naka Roger Paul.* I would also like to thank members of the MIT Passamaquoddy Group, the audience of the 55th Algonquian Conference, and anonymous reviewers for WSCLA 2024 for helpful questions, comments, and discussion. All errors are mine.

¹Conservatively, the form is *cuw(i)*- at the left edge of a phonological word, and *ahcuw(i)*- otherwise (by regular vowel syncope processes; LeSourd 1993). However, many contemporary speakers use both *cuw(i)*- and *ahcuw(i)*- in free variation with prefixes (*ahcuw(i)*- never appears at the left edge of phonological words):

- (i) a. Pihce **n-cuwi**= wiss-ek-iqe-n-s-ulti-pon.
while **1-must**= cover-sheet-face-by.hand_{TA}-REFL-PL-1PL
 - b. Pihce **nt-ahcuwi**= wiss-ek-iqe-n-s-ulti-pon.
while **1-must**= cover-sheet-face-by.hand_{TA}-REFL-PL-1PL
- Both: 'A while back we had to wear masks.' (EM 2023.08.08)

²*Cu-al-lu* is morphologically decomposable into the particle *cu* 'surely; FUT', and the second-position clitics =*al* 'lack of direct knowledge' and =*lu* 'contrastive topic'. I'm not sure if the semantics is compositionally built up from these parts synchronically, and I treat it as synchronically non-decomposable.

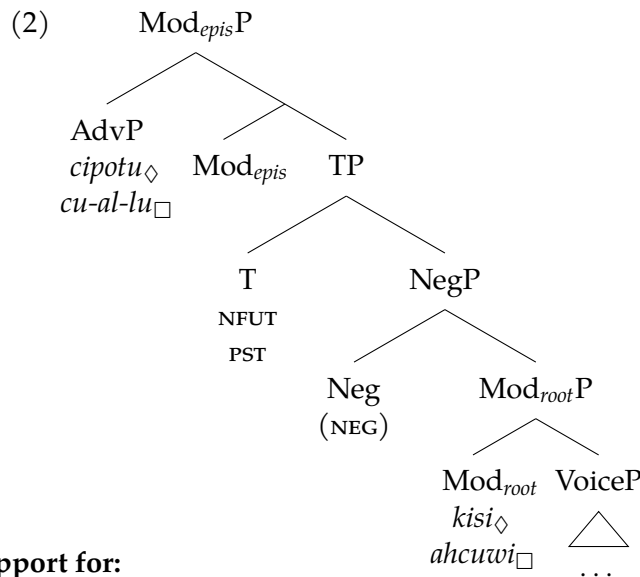
◆ **Conclusions:**

- ▶ Passamaquoddy-Wolastoqey modals distinguish both **force** and **flavor**:

(1)

	◇ (possibility)	□ (necessity)
Root	<i>kisi-</i>	<i>ahcuwi-</i>
Epistemic	<i>cipta</i>	<i>cu-al-lu</i>

- ▶ PW epistemic modals are **high adverbs** base-generated **above tense**, and PW root modals are base-generated **below negation**. All modals take scope *in situ*.



◆ **Support for:**

- ▶ root modals being first Merged **below tense and negation**;
(Picallo 1990, Condoravdi 2002, Stowell 2004, Iatridou and Zeijlstra 2013, Rullmann and Matthewson 2018, Jeretič 2021, a.o.)
- ▶ epistemic modals being **higher than root modals**;
(Picallo 1990, Cinque 1999, Stowell 2004, Hacquard 2006, 2010, a.o.)
- ▶ epistemic modals—at least adverbial ones—scoping **over tense**.
(Hacquard 2006, 2010, Chen et al. 2017, Rullmann and Matthewson 2018, a.o.)

◆ **The plan:**

- ▶ Basics: the **morphosyntax** of these modals (§2.1), and their **force** and **flavor** (§2.2).
- ▶ Interaction with **negation** (§3) and **tense** (§4).
- ▶ The **formal analysis** under a standard Kratzerian semantics of modality (§5).
(Kratzer 1977, 1981, 1991, 2012, a.m.o.)
- ▶ **Conclusion** and a **puzzle about *kisi-*** (§6).

2 The basics

- ◆ PW is traditionally split into two mutually-intelligible dialects: **Passamaquoddy**, spoken in eastern Maine, and **Wolastoqey** (also known as Maliseet), spoken in New Brunswick.
- ◆ **The data** for this talk comes from ongoing work (2020–present) using standard semantic fieldwork methodology (Matthewson 2004, Bochnak and Matthewson 2015, a.o.) and carried out primarily over Zoom, with **four speakers** of PW: **Margaret Apt** (Passamaquoddy; Sipayik), **Edwina Mitchell** (Wolastoqey; Neqotkuk), **Grace Paul** (Passamaquoddy; Sipayik), and **Roger Paul** (Wolastoqey/Passamaquoddy; Neqotkuk/Motahkomikuk).

2.1 Morphosyntax

2.1.1 Root modals are low

- ◆ The root modals *kisi-* ‘can’ and *ahcuwi-* ‘must’ are **initials/preverbs**³—morphemes that appear **within the verbal complex to the left of the verb stem**.⁴

(Bloomfield 1946, Goddard 1990, a.o.)

(3) *ahcuwi-* ‘must’ in initial/preverb position:

- a. Ma=te 't-**ahcuw**-wehka-w-on-ol '-pihtin-ol. *Initial*
NEG=EMPH 3-must-use_{AI+O}-NEG-N-IN.PL 3-hand-IN.PL
 ‘He doesn’t **have to** use his hands (when riding a bike).’ (EM 2023.08.22)
- b. Nt-**ahcuwi**= monuw-a sukolopan sepawonu. *Preverb*
 1-**must**= buy_{TA-3OBJ} cake tomorrow
 ‘I **have to** buy a cake tomorrow.’ (GP, MA 2022.11.16)

(4) *kisi-* ‘can’ in initial/preverb position:

- a. '-**Kis**-okehkim-oq =op Roger skicinu-w-atuwewakon. *Initial*
 2-**can**-teach_{TA-INV} =CF Roger native-language
 ‘Roger **could** teach you the language.’ (EM 2023.07.25)
- b. Ma=te n-**kisi**= kuwi-w *Preverb*
NEG=EMPH 1-can= sleep_{AI-NEG}
 ‘I **can’t** sleep.’ (GP, MA 2023.05.16)

- ◆ The person prefixes are in **T/Infl**, indicating by the **Mirror Principle** that root modals are **lower than tense**. (Oxford 2017, 2019, Hammerly 2020, Grishin 2023, a.o.)

³I take the distinction between “initial” and “preverb” to be prosodic: initials attach to bound stems and are part of the same phonological word as the verb stem, and preverbs attach to free stems and are not part of the same phonological word as the verb stem (LeSourd 1993).

⁴Abbreviations: 1 = first person, 2 = second person, 3 = third person, ABSN = absentative, AI = animate intransitive, AI+O = animate intransitive with secondary object, APPL = applicative, C = complementizer, CF = counterfactual, CJ = conjunct, CONJ = conjectural, DIM = diminutive, DUB = dubitative preterit, EMPH = emphatic, FUT = future, IC = initial change, II = inanimate intransitive, IN = inanimate, INCL = inclusive, INF = infinitive, INV = inverse, LOC = locative, N = N formative, NDIR = indirect, NEG = negative, NFUT = nonfuture, NPERF = nonperfect, OBJ = object, OBV = obviative, PFV = perfective, PL = plural, POSS = possessive, PPT = perfect participle, PRET = preterit, PROG = progressive, PROSP = prospective, PROX = proximate, PST = past, REFL = reflexive, SBJV = subjunctive, SG = singular, TA = transitive animate, TI = transitive inanimate, X = unspecified subject.

2.1.2 Epistemic modals are high

- ◆ The epistemic modals *cipta* ‘maybe’ and *cu-al-lu* ‘must be’ are **preverbal particles**, overwhelmingly often appearing at the **left edge of the clause**:

- (5) a. **Cipta** n-tus ‘t-api= maceptu-n.
maybe 1-daughter 3-go= take.away_{TI-N}
 ‘Maybe my daughter took it [the dress].’ (MA 2023.10.02)
- b. **Cu-al-lu** Piyel olomi= nutehe-Ø.
must.be Peter away= go.out_{AI-3}
 ‘Peter **must** have gone out.’ (EM 2023.08.29)

- ▶ However, occasionally you can get at least subjects to precede them:

- (6) a. Piyel **ciptuk**=ote liye-Ø etoli= maqaha-mok.
 Peter **maybe**=EMPH go_{AI-3} IC.there= gather_{AI-XCJ}
 ‘Peter **might** go to the gathering.’ (EM 2023.08.22)
- b. Psuwis **cu-al-lu** ‘-poneq-tah-a-soponi-l waloti-yil.
 cat **must.be** 3-down-hit_{TA-3OBJ-DUB-OBV.SG} dish-OBV.SG
 ‘The cat **must** have knocked down the dish.’ (EM, RP 2022.05.09;GR)

- ▶ I assume that these phrases have \bar{A} **moved** (e.g. topicalized) to a high position.

- ◆ The epistemic modals must also **precede negative particles**:

- (7) a. ***Ma=te** **cipta**=te pomoqittu-Ø-Ø Piyel.
 NEG=EMPH **maybe**=EMPH drive_{AI-NEG-3} Peter
 Intended: ‘Peter **can’t** be driving.’ (EM 2023.08.29)
 EM: “Those two words don’t go together, *ma-te cipta*.’
- b. ***Ma=te** **cu-al-lu** olomi= nutehe-w-Ø Piyel.
 NEG=EMPH **must.be** away= go.out_{AI-NEG-3} Peter
 Intended: ‘Peter **doesn’t have to** have gone out.’ (EM 2023.08.29)
 EM: “*ma-te cu-al-lu* doesn’t work at all.”

- ◆ The epistemic modals **follow the complementizer *eli***: (no data for *cu-al-lu* yet)

- (8) Toke Ø-nokatom-on [CJ eli **cipta** Mehqihtuwat koti= kotumahsi-t
 now 1-fear_{TI-N} IC.C **maybe** red.beard going.to= drum_{AI-3CJ}
 sepawonu].
 tomorrow
 ‘Now I’m afraid Norvin **might** be going to drum tomorrow.’ (MA 2024.03.22)

- ◆ Finally, the epistemic modals can appear in **larger, CP-sized complements**, but not in **smaller, TP-sized complements**

◆ Evidence from *nokatomon* ‘fear’, which can embed both CP-sized and TP-sized clauses.

(see Grishin 2023, 2024 for discussion of clause types and clause size in PW)

(9) Different sizes of complements to *nokatomon* ‘fear’⁵

a. CP-sized

Ø-Nokatom-on [CP cu Ø-wihqim-a-l Sapet-ol].
 1-fear_{TI-N} FUT 3-invite_{TA-3OBJ-OBV.SG} Elizabeth-OBV.SG
 ‘I’m afraid he’ll invite Elizabeth.’ (MA 2023.02.21;NR)

b. TP-sized

Ø-Nokatom-on [TP n-ikuwoss nt-olatpem-ku-n].
 1-fear_{TI-N} 1-mother 1-lecture_{TA-INV-N}
 ‘I’m afraid my mother is going to lecture me.’ (EM 2024.03.25)

(10) Only CP-sized complements of *nokatomon* ‘fear’ can contain *cipotu* ‘maybe’

a. CP-sized: ✓

Sapet Ø-nokatom-on [IND **cipotu** Piyel mec kuw-Ø-wa].
 Elizabeth 3-fear_{TI-N} **maybe** Peter still sleep_{AI-3-ABSN.PROX.SG}
 ‘Elizabeth is afraid Peter **might** still be sleeping.’ (MA 2024.04.15)

b. TP-sized: ✗

*Sapet Ø-nokatom-on [SUB **cipotu** Piyel mec ‘-kuwi-n].
 Elizabeth 3-fear_{TI-N} **maybe** Peter still 3-sleep_{AI-N}
 Intended: ‘Elizabeth is afraid Peter **might** still be sleeping.’ (MA 2024.04.15)

► **Note:** root modals **can** occur in small, TP-sized complements:

(11) Context: Peter is deciding how much money to steal from Roger.

Piyel ‘-pawatom-uw-a-n [TP Lacaw-ol ‘-kis-onuhm-on cincoel].
 Peter 3-want_{TI-APPL-3OBJ-N} Roger-OBV.SG 3-**can**-buy_{TI-N} ginger.ale
 ‘Peter wants Roger to **be able to** buy ginger ale.’ (GP, MA 2023.05.02)

◆ I conclude that the epistemic modals *cipotu* ‘maybe’ and *cu-al-lu* ‘must be’ are **high adverbs** in the low CP domain, **above TP**.

(12) [CP *eli* [Mod_{epis}P *cipotu/cu-al-lu* [TP ...]]]

⁵*Nokatomon* ‘fear’ complements cannot contain *cu-al-lu* ‘must be’, even when CP-sized:

(i) #Sapet Ø-nokatom-on [CP **cu-al-lu** Piyel mec kuw-Ø-wa].
 Elizabeth 3-fear_{TI-N} **must.be** Peter still sleep_{AI-3-ABSN.PROX.SG}
 #‘Elizabeth fears that Peter **must** still be sleeping.’ (MA 2024.04.15)

The same facts seem to hold of predicates meaning ‘hope’ and ‘fear’ crosslinguistically—see Anand and Hacquard (2013) for discussion and analysis. *Cu-al-lu* ‘must be’ can appear under verbs like *litahasu* ‘think’:

(ii) Sapet litahasu-Ø [CP **cu-al-lu** Piyel mec kuw-Ø-wa].
 Elizabeth think_{AI-3} **must.be** Peter still sleep_{AI-3-ABSN.PROX.SG}
 ‘Elizabeth thinks that Peter **must** still be sleeping.’ (MA 2024.04.15)

2.2 Force and flavor

2.2.1 Kisi

- ◆ *Kisi-* ‘can’ is a **root possibility modal**, compatible with **any kind of root reading**:

(13) a. **Circumstantial possibility:** ✓

Context: You see a patch of fertile soil.

Sahti-yil li= kisi-kon-Ø-ul yuta.
blueberry-IN.PL there= can-grow_{II-3-IN.PL} here
‘Blueberries can grow here.’ (GP, RP 2020.06.24)

b. **Deontic possibility:** ✓

Context: Sipsis’s parents have a rule that she has to do her homework before she can have ice cream. Now, she’s finished her homework.

Sipsis toke ‘-kis-otom-on tek-coke-Ø-k.
Sipsis now 3-can-eat_{II-N} IC.cold-mushy-be_{II-CJ}
‘Sipsis can eat ice cream now.’ (EM 2023.09.11)

- ◆ *Kisi-* ‘can’ is **incompatible** with any kind of **root necessity** reading:

(14) a. **Circumstantial necessity:** ✗

Context: Your friend ate something rotten and is rushing to the bathroom.

#N-itap kisi= sokku-Ø.
1-friend can= vomit_{AI-3}
Intended: ‘My friend has to vomit.’ (MA 2023.09.18)

b. **Deontic necessity:** ✗

Context: There’s a rule that we have to leave the building at 8pm so that the janitors can clean. It’s now 8pm.

#’-Kisi= macehk-awoti-pon.
2-can= leave.together_{AI-PL-1PL}
Intended: ‘We have to leave.’ (EM 2023.09.11)
EM: “You’re just saying we can leave...it’s not ‘we have [to]’.”

- ◆ Nor is *kisi-* ‘can’ compatible with **epistemic possibility**:

(15) **Epistemic possibility:** ✗

- a. *Context: The weather forecast says that there’s a 50% chance of rain tomorrow.*

#Kisi=te komiwon-Ø sepawonuk.
can=EMPH rain_{II-3} tomorrow
Intended: ‘It might rain tomorrow.’ (EM 2023.09.11)

- b. *Context: You heard there’s a storm up north, and you don’t know whether it’s going to head south or continue north.*

#Kisi= wisok-amoqessu-Ø temonu.
can= very-storm_{II-3} later
Intended: ‘There might be a big storm later.’ (MA 2023.09.18)

2.2.2 Ahcuwi

- ◆ Ahcuwi- ‘must’ is a **root necessity modal**, compatible with **any kind of root reading**:

- (16) a. **Circumstantial necessity: ✓**
Context: Your friend has eaten something rotten. They put their hands over their mouth and run to the bathroom.
 N-itap **cuwi**= sokku-Ø.
 1-friend **must**= vomit_{AI-3}
 ‘My friend **has to** vomit.’ (MA 2023.09.18)
- b. **Deontic necessity: ✓**
Context: There’s a rule that we have to leave the building at 8pm so that the janitors can clean. It’s now 8pm.
 Kt-ahcuwi= macehk-awoti-pon.
 2-**must**= leave.together_{AI-PL-1PL}
 ‘We **have to** leave.’ (EM 2023.09.11)

- ◆ Ahcuwi- ‘must’ is **incompatible** with any kind of **root possibility** reading:

- (17) a. **Circumstantial possibility: ✗**
Context: We’re walking by the river before fiddlehead season and see some shaded soil.
 #Mahsusi-yil toli= **cuwi**-kon-Ø-ul yut.
 fiddlehead-IN.PL there= **must**-grow_{II-3-IN.PL} here
 Intended: ‘Fiddleheads **can** grow here.’ (EM 2023.09.11)
- b. **Deontic possibility: ✗**
Context: Sipsis’s parents have a rule that she has to do her homework before she can have ice cream. Now, she’s finished her homework.
 #Sipsis toke ‘t-ahcuwi= mici-n tek-coke-Ø-k.
 Sipsis now 3-**must**= eat_{II-N} ic.cold-mushy-be_{II-CJ}
 Intended: ‘Sipsis **can** have ice cream now.’ (EM 2023.09.11)
 EM: “That sounds OK, but it just means she *has* to have the ice cream.”

- ◆ Nor is ahcuwi- ‘must’ compatible with **epistemic necessity**:

- (18) **Epistemic necessity: ✗**
- a. *Context: We are out moose-hunting and see some fresh moose tracks.*
 #Kt-ahcuwi=te wecuwawkuw-a-n mus.
 2-**must**=EMPH be.near_{TA-3OBJ-1PL} moose
 Intended: ‘We **must** be near the moose.’ (GP 2020.07.08)
 GP: “[That’s] something you *have to* do.”
- b. *Context: You see your granddaughter come into the house with a wet umbrella.*
 #Cuwi= komiwon-Ø.
must= rain_{II-3}
 Intended: ‘It **must** be raining.’ (EM 2023.09.11)
 EM: “You’re just saying it *has to* rain.”

2.2.3 *Cipotu*

- ◆ *Cipotu* is an **epistemic possibility modal**:

(19) **Epistemic possibility: ✓**

- a. *Context: You're at a gathering right now. Peter usually goes to every gathering, but he's not here. You're trying to figure out why he's not here. You guess:*

Cipotu=te ksinuhka-Ø Piyel.

maybe-EMPH be.sick_{AI-3} Peter

'Peter **might** be sick.' (GP, RP 2020.06.24)

- b. *Context: The weather report says there's a 50% chance of rain tomorrow.*

Cipotu komiwon-Ø sepawonuk.

maybe rain_{II-3} tomorrow

'It **might** rain tomorrow.' (EM 2023.09.11)

- ◆ A clear indication that *cipotu* is a **possibility modal** comes from the observation that it's possible to utter sentences of the form *cipotu p* & *cipotu ¬p*:

- (20) a. **Cipotu**=te leyu-Ø, **cipotu** ma=te nit leyi-w-Ø;
maybe=EMPH be.true_{II-3} **maybe** NEG=EMPH that.IN be.true_{II-NEG-3}
 ma=te n-kocicihtu-w-on.
 NEG=EMPH 1-know_{TI-NEG-N}

'**Maybe** it's true, **maybe** it isn't; I don't know.' (EM 2021.01.06)

- b. **Cipotu** wisok-olan-Ø temonu, naka **cipotu** skat.

maybe very-rain_{II-3} later and **maybe** NEG

'**Maybe** it'll rain later, and **maybe** it won't.' (MA 2023.09.18)

- ◆ *Cipotu* is **incompatible** with any kind of **root possibility reading**:

(21) a. **Circumstantial possibility: ✗**

Context: We're out moose-hunting, and are well-hidden in the bushes. We see a deer close by within range, which isn't our target, and I whisper:

#**Cipotu**=te=hp n-peskh-a not otuhk, kenuk ma=te=hc
maybe=EMPH=CF 1-shoot_{TA-3OBJ} that.PROX.SG deer but NEG=EMPH=FUT
 n-peskh-a-wi.
 1-shoot_{TA-3OBJ-NEG}

Intended: 'I could shoot that deer, but I won't shoot it.' (GP, RP 2020.07.22)

- b. **Deontic possibility: ✗**

Context: Roger has a rule that his granddaughter has to finish her homework before going outside to play. However, she doesn't like to go outside, and prefers to stay inside playing on her phone. She's just finished her homework, so Roger tells me:

#**Cipotu**=te nute-he-Ø, ma takh koti= nute-he-w-Ø.
maybe=EMPH out-go_{AI-3} NEG EMPH going.to= out-go_{AI-NEG-3}

Intended: 'She **can** go out now, but she's not going to go out.' (GP 2020.08.05)

2.2.4 *Cu-al-lu*

- ◆ *Cu-al-lu* is an **epistemic necessity modal**:

(22) **Epistemic necessity: ✓**

- a. *Context: You are out hunting and see some fresh moose tracks.*

Cu-al-lu k-wecuwawkuw-a-n mus.

must.be 2-be.near_{TA-3OBJ-1PL} moose

'We **must** be near a moose.' (GP 2020.07.08)

- b. *Context: You see your granddaughter come into the house with a wet umbrella.*

Cu-al-lu komiwon-Ø.

must.be rain_{II-3}

'It **must** be raining.' (EM 2023.09.11)

- ◆ A clear indication that *cu-al-lu* is a **necessity modal** comes from the observation that it's **impossible** to utter sentences of the form *cu-al-lu p* & *cu-al-lu ¬p*:

- (23) #**Cu-al-lu** leyu-Ø, **cu-al-lu** ma=te nit leyi-w-Ø; ma=te
must.be be.true_{II-3} **must.be** NEG=EMPH that.IN be.true_{II-NEG-3} NEG=EMPH
 n-kocicihtu-w-on.
 1-know_{TI-NEG-N}

Intended: 'Maybe it's true, maybe it isn't; I don't know.' (EM 2021.01.06)

EM: "I wouldn't put those two together."

- ◆ *Cu-al-lu* is **incompatible** with any kind of **root necessity reading**:

(24) a. **Circumstantial necessity: ✗**

Context: Your friend has eaten something rotten. They put their hands over their mouth and start running to the bathroom.

#**Cu-al-lu** n-itap sokku-Ø.

must.be 1-friend vomit_{AI-3}

Intended: 'My friend **has to** vomit.' (MA 2023.09.18)

MA: "[It means] you assume he already did it."

b. **Deontic possibility: ✗**

Context: Peter's mother has a rule that he has to clean his room every Saturday. But he often disobeys. Today is Saturday.

#**Cu-al-lu** Piyel Ø-wisunom-on 't-olamsoku-m.

must.be Peter 3-tidy_{TI-N} 3-room-POSS

Intended: 'Peter **has to** tidy his room.' (EM 2023.09.11)

- ▶ Note on (24a): it's often very difficult to reliably differentiate epistemic from circumstantial readings, especially for necessity modals. **Let me know if there's a better kind of context to text this!**

- (The first-person counterpart of (24a) is also unacceptable, for what it's worth.)

2.2.5 Summary

- ◆ PW modals are **fixed force and flavor**, as summarized below:

(25)

	◇ (possibility)	□ (necessity)
Root	<i>kisi-</i>	<i>ahcuwi-</i>
Epistemic	<i>cipta</i>	<i>cu-al-lu</i>

3 Interaction with negation

- ◆ The **root modals** *kisi-* ‘can’ and *ahcuwi-* ‘must’ can only **scope under negation**; the **epistemic modals** *cipta* ‘maybe’ and *cu-al-lu* ‘must’ can only **scope over negation**.

3.1 Root modals

- ◆ The root modals *kisi-* ‘can’ and *ahcuwi-* ‘must’ can **scope under negation**:

(26) *Kisi-* ‘can’ scopes under negation

- a. $\neg \gg$ *kisi*, **circumstantial**: ✓

Context: *I have insomnia.*

Ma=te n-*kisi*= kuwi-w.

NEG=EMPH 1-**can**= sleep_{AI-NEG}

‘I **can’t** sleep.’ (GP, MA 2023.05.16)

- b. $\neg \gg$ *kisi*, **deontic**: ✓

Context: *In the army you must keep clean-shaven.*

Ma wen **kisi**= kawih_{tuwi-w-Ø} ‘-sisoq qen-okehkim-ut

NEG anyone **can**= have.stubble_{AI-NEG-3} 3-face IC.while-teach_{TA-X:3CJ}

mikahkewinu-wihkuk.

warrior-LOC.PL

‘**No one may** have stubble on their face when being trained in the army.’

(<https://pmportal.org/dictionary/kawih_{tuwi-w}>; translation mine)

(27) *Ahcuwi-* ‘must’ scopes under negation

- a. $\neg \gg$ *ahcuwi*, **circumstantial**: ✓

Context: *You ate something rotten yesterday, and had to vomit all of last night. But today you feel much better.*

Ma=te toke nt-*ahcuwi*= sokoqi-w.

NEG=EMPH now 1-**must**= vomit_{AI-NEG}

‘Now I **don’t have to** vomit.’ (EM 2023.08.08)

- b. $\neg \gg$ *ahcuwi*, **deontic**: ✓

Context: *At this gathering, joining the dancing is encouraged but not required.*

Ma=te kt-*ahcuwi*= pomoka-hti-pon skat pawatom-uw-o(h)q.

NEG=EMPH 2-**must**= dance_{AI-PL-1PL} NEG want_{TI-NEG-(NEG)1INCL.CJ}

‘We **don’t have to** dance if we don’t want to.’ (MA 2023.09.18)

◆ These modals **cannot scope over negation**:

(28) *Kisi-* ‘can’ doesn’t scope over negation

a. *kisi* $\gg \neg$, **circumstantial**: ✗

Context: *At school, class was so boring that you were almost falling asleep. But in the end, you managed to not fall asleep.*

#**Ma=te** n-kis-qahsi-w-on nutokehkitikuwam-ok.

NEG=EMPH 1-can-sleep_{AI-NEG-N} school-LOC

Intended: ‘I **was able to not** sleep at school.’ (GP, MA 2023.05.16)

b. *kisi* $\gg \neg$, **deontic**: ✗

Context: *At this gathering, joining the dancing is encouraged but not required.*

#**Ma=te** ‘-kisi= pomoka-hti-pon skat pawatom-uw-o(h)q.

NEG=EMPH 2-can= dance_{AI-PL-1PL} NEG want_{TI-NEG-(NEG)1INCL.CJ}

Intended: ‘We’re **allowed to not** dance if we don’t want to.’ (MA 2023.09.18)

(29) *Ahcuwi-* ‘must’ doesn’t scope over negation

a. (no circumstantial example yet—any suggestions for contexts?)

b. *ahcuwi* $\gg \neg$, **deontic**: ✗

Context: *There are laws against drinking and driving.*

#Kis-ossomi-yin, **ma=te** kt-ahcuwi= yaloqittu-Ø.

PFV-drink_{AI-2SG.CJ} NEG=EMPH 2-must= drive_{AI-NEG}

Intended: ‘If you’ve drunk, you **must not** drive.’ (EM 2023.08.08)

EM: “It does mean something weird, it doesn’t make sense to me...”

3.2 Epistemic modals

◆ The epistemic modals *cipta* ‘maybe’ and *cu-al-lu* ‘must be’ can **scope over negation**:

(30) a. *cipta* $\gg \neg$: ✓

Context: *It’s 11pm, and the lights in Peter’s place are out. He usually stays up late, so he might have gone out. Alternatively, he could have gone to sleep early. Roger thinks he must have gone out, but you think there are other options. You say:*

Cipta=te **ma=te** nutehe-wi-Ø-ss.

maybe=EMPH NEG=EMPH go.out_{AI-NEG-3-DUB}

‘Peter **might not** have gone out.’ (EM 2023.08.29)

b. *cu-al-lu* $\gg \neg$: ✓

Context: *Norvin and Peter are late to the gathering. Peter drives fast, but Norvin is a very cautious driver. You deduce:*

Cu-al-lu **ma=te** pomoqittu-Ø-Ø Piyel.

must.be NEG=EMPH drive_{AI-NEG-3} Peter

‘Peter **must not** be driving.’ (EM 2023.08.29)

♦ These modals **cannot scope under negation**:

(31) ¬ ≫ *cipotu*: ✗

Context: Norvin and Peter are late to the gathering. Peter drives fast, but Norvin is a very cautious driver. You deduce:

a. #**Ma=te** **cipotu=te** pomoqittu-Ø-Ø Piyel.
 NEG=EMPH maybe=EMPH drive_{AI}-NEG-3 Peter

b. #**Cipotu=te** **ma=te** pomoqittu-Ø-Ø Piyel.
 maybe=EMPH NEG=EMPH drive_{AI}-NEG-3 Peter

Intended: ‘Peter **can’t** be driving.’ (EM 2023.08.29)

(32) ¬ ≫ *cu-al-lu*: ✗

Context: It’s 11pm, and the lights in Peter’s place are out. He usually stays up late, so he might have gone out. Alternatively, he could have gone to sleep early. Roger thinks he must have gone out, but you think there are other options. You say:

a. #**Ma=te** **cu-al-lu** olomi= nutehe-w-Ø Piyel.
 NEG=EMPH must.be away= go.out_{AI}-NEG-3 Peter

b. #**Cu-al-lu** **ma=te** olomi= nutehe-w-Ø Piyel.
 must.be NEG=EMPH away= go.out_{AI}-NEG-3 Peter

Intended: ‘Peter **doesn’t have to** have gone out.’ (EM 2023.08.29)

4 Interaction with tense

♦ In PW, verbs can appear in **three tense forms**:

- ▶ **Unmarked**, compatible with past, present, but not future readings (outside of scheduled/planned/certain contexts):

(on futurates, see Cipria and Roberts 2000, Kaufmann 2005, Copley 2008, 2009, 2014, a.o.)

(33) a. Nil n-ucihtihik wolaku. *Past: ✓*
 1SG 1-win_{AI} yesterday
 ‘I won yesterday.’ (GP, RP 2021.05.24)

b. Totol-olan toke. *Present: ✓*
 PROG-rain_{II} now
 ‘It’s raining now.’ (GP 2021.05.10)

c. #Nil n-ucihtihik sepawonuk. *Future: ✗*
 1SG 1-win_{AI} tomorrow
 Intended: ‘I will win tomorrow.’ (GP, RP 2021.05.24)
 GP: “It sounds like you know you’re going to win tomorrow.”

- ▶ **Preterit** (*-hpon, -poni*), compatible with past readings only:

- (34) a. *Context: Peter used to have red hair, but recently dyed it brown.*
 Piyel pq-atpe-**hpon**. Past: ✓
 Peter red-have.hair_{AI}-**PRET**
 ‘Peter had red hair.’ (GP, RP 2021.02.22)
- b. *Context: Peter has red hair right now.*
 #Piyel pq-atpe-**hpon**. Present: ✗
 Peter red-have.hair_{AI}-**PRET**
 Intended: ‘Peter has red hair.’ (GP, RP 2021.02.22)

- ▶ **Dubitative preterit** (*-ss, -soponi*), compatible with past readings only and found in a restricted set of contexts (mainly in questions, in the antecedent of counterfactual conditionals, and under modals).

- (35) a. *Context: Roger went somewhere, but you don’t know where. You say:*
 Tama =hkal olomiye-**Ø-ss**? Past: ✓
 where =CONJ leave_{AI}-3-**DUB**
 ‘I wonder where he went?’ (EM 2023.05.30)
- b. *Context: At a party, someone comes up to you and talks to you as if y’all know each other. After they leave, you ask your friend:*
 #**Ø-Nonuw-a-ss** not nil? Present: ✗
 1-know_{TA}-3OBJ-**DUB** that.PROX.SG 1SG
 Intended: ‘Do I know them?’ (EM, RP 2022.05.23;GR)
 RP: “I picture this at a funeral: *nonuwass not nil?* Did I know this person?”

- ◆ The **root modals** scope **below tense**, and the **epistemic modals** scope **over tense**.

4.1 Root modals

- ◆ In PW, the root modals *kisi-* ‘can’ and *ahcuwi-* ‘must’ **scope below tense**—they can get **past tense readings** (past temporal perspective), whether with overt or null tense.

(on these terms, see Condoravdi 2002)

- (36) *Kisi-* ‘can’ with past perspective
- a. **PAST** ≫ *kisi*, **circumstantial**: ✓
Context: I broke my hand earlier today, so now I can’t write, but yesterday I could.
 Wolaku n-**kis-uwikhik(e-hpon)**.
 yesterday 1-**can**-write_{AI}(-**PRET**)
 ‘I **could** write yesterday’ (EM 2023.09.25)
- b. **PAST** ≫ *kisi*, **deontic**: ✓
Context: My driver’s license recently expired.
 Pihce-hsis n-**kisi=** yaloqittu-**hpon**, ma=te toke n-**kisi=** yaloqittu-**Ø**.
 while-DIM 1-**can=** drive_{AI}-**PRET** NEG=EMPH now 1-**can=** drive_{AI}-**NEG**
 ‘A while back I **could** drive, but now I can’t.’ (EM 2023.08.22)

(37) *Ahcuwi*- ‘must’ with past perspective

a. **PAST** \gg *ahcuwi*, **circumstantial**: ✓

Context: You ate something rotten yesterday, and had to vomit all of last night. But today you feel much better.

Nt-**ahcuwi**= sokoq ‘qoci-tpuhk.

1-**must**= vomit_{AI} all.night

‘I had to vomit all night.’ (EM 2023.08.08)

b. **PAST** \gg *ahcuwi*, **deontic**: ✓

Context: During the COVID-19 pandemic a few years ago, there were rules that we had to wear masks. But now those rules are gone in most places.

Pihce nt-**ahcuwi**= wissekiqen-s-ulti-ponu-**hpon**.

while 1-**must**= cover.face_{TA}-REFL-PL-1PL-**PRET**

‘A while back we had to wear masks.’ (EM 2023.08.08)

◆ These modals **cannot scope over tense**. To show this is slightly complicated.

► In many instances, this would be ruled out due to the **Diversity Condition**, which ends up forcing the prejacent of a circumstantial modal to be **future-shifted**.

(see Condoravdi 2002, Werner 2003, 2006, Thomas 2014 for discussion and details)

► However, **priority modals** (deontic, bouletic, teleological, etc.) don’t seem to be subject to this constraint, and allow for **back-shifted prejacent**s. (Ninan 2005, Thomas 2014)

(on priority modals, see Portner 2009)

(38) *Backshifting with teleological modals*

To become a virtuoso violinist, you {**must/should**} **have** started to practice early in your life. (Thomas 2014:441)

► In these kinds of contexts, we find that *ahcuwi*- ‘must’ **cannot be used at all** (whether with the preterit *-hpon* or the perfect(ive) *kisi*-)—instead, you have to use the TP-embedding verb *cuwitpot* ‘it should be’. (more on the *kisi* ambiguity in §6.2)

(39) *Context: Elizabeth’s current fleeting obsession is to become a professional runner. You don’t think this is in the cards for her because she wasn’t very active as a kid.*

Etokiw Sapet toke pawato-k ‘-kisi= kakawi= qasqi-n...

if Elizabeth now want_{TI}-3CJ 3-can= fast= run_{AI}-N

‘If Elizabeth now wants to be able to run fast...’ (EM 2023.10.30)

a. #...**cuwi**= yali= qasku-Ø-**hpon** ewasisuwi-t.

must= around= run_{AI}-3-**PRET** ic.be.child_{AI}-3CJ

b. #...**cuwi**= **kisi**= yali= qasku-Ø ewasisuwi-t.

must= **PFV**= around= run_{AI}-3 ic.be.child_{AI}-3CJ

Intended: ‘...she needs to have run a lot as a child.’ (EM 2023.10.30)

c. ...**cuwitpot**-Ø [_{TP} ‘t-iyali= qasqi-ne-**hpon** ewasisuwi-t].

should.be_{II}-3 3-around= run_{AI}-N-**PRET** ic.be.child_{AI}-3CJ

‘...she should have run a lot as a child.’ (EM 2023.10.30)

- ▶ Note that *cuwitpot* ‘it should be’ embeds a TP, which can host past tense scoping under the modal, deriving the correct reading for this context.
- ▶ I haven’t been brave enough to try and test this with priority *kisi-* ‘can’, but I expect it to behave like *ahcuwi-* ‘must’.

4.2 Epistemic modals

- ◆ In contrast to the root modals, the epistemic modal *cipotu* **cannot scope under tense**.⁶
- ◆ To test this, I used the “**Feeding Fluffy**” storyboard. (TFS Working Group 2012)
- ◆ In the part of the storyboard summarized below, which tests **past perspective** with **epistemic modals**, consultants consistently choose to **use the verb *litahasu* ‘think, believe’**⁷ rather than an epistemic modal:

(40) *Context: Your friend Pat is wondering why you bought a bone for his pet snake. When you bought the bone, you didn’t know what kind of animal he had, and you bought it because he might have had a dog, for all you knew back then.*

 - a. **Nt-olitahasi-hpon** =al olomuss eyw-ot.
1-think_{AI-PRET} =NDIR dog ic.have_{TA-2SG:3CJ}
‘I **thought** you **might have** had a dog.’ (GP 2020.11.03)
 - b. **Nt-olitahasi-hpon** olomuss eyw-ot.
1-think_{AI-PRET} dog ic.have_{TA-2SG:3CJ}
‘I **thought** you **might have** had a dog.’ (EM 2023.08.29)
- ◆ In fact, using *cipotu* ‘maybe’ here is judged **unacceptable**:

(41) *Context: same as above.*

 - a. #**Cipotu**=te olomuss eyw-ot.
maybe=EMPH dog ic.have_{TA-2SG:3CJ}
Intended: ‘You **might have** had a dog.’ (GP 2020.11.03)
 - b. #**Cipotu**=te kt-iyw-a olomuss.
maybe=EMPH 2-have_{TA-3OBJ} dog
Intended: ‘You **might have** had a dog.’ (EM 2023.08.29)
- ◆ **Conclusion:** while verbs like *litahasu* easily scope under tense and can be used in this kind of context, *cipotu* ‘maybe’ **cannot**.

⁶It’s hard to test whether epistemic necessity modals like *cu-al-lu* can scope under past tense. In order to test this, one would need a context where someone’s past knowledge necessitated that *p*, but one’s current knowledge doesn’t (and thus you don’t believe *p* anymore), and test a sentence like *PAST cu-al-lu p*. This test becomes impossible to do (as far as I can tell) if *cu-al-lu p* entails *p* (or, at least, someone cannot utter *cu-al-lu p* without also believing that *p*). But in this context, the speaker no longer believes that *p*.

⁷Interestingly, there’s no modal in the complement clause in these examples. This might suggest that *litahasu* ‘think, believe’ in PW actually has a weak, *existential* meaning (something more like ‘think might’). On existential attitudes, see Anand and Hacquard (2013), Močnik and Abramovitz (2019), and Močnik (2023).

- ◆ In contrast, the epistemic modals **can scope over tense** (whether null or overt):

(42) a. *cipotu* » PAST: ✓

Context: *I'm wondering why my friend has such an ugly dog. I have no idea what the real answer is. Maybe it was cuter when he adopted it?*

Cipotu wolik-ossu-Ø(-hpon) apsokil-s-ossi-t(-pon).
maybe be.beautiful_{AI-DIM-3(-PRET)} ic.be.small_{AI-DIM-DIM-3CJ(-PRET)}
 'It **might have** been cute when it was small.' (MA 2023.10.02)

b. *cu-al-lu* » PAST: ✓

Context: *Roger sees that Peter's lights are out, and comes to the conclusion that he went out somewhere. He says:*

Cu-al-lu Piyel olomi= nutehe-Ø(-ss).
must.be Peter away= go.out_{AI-3(-DUB)}
 'Peter **must have** gone out.' (EM 2023.08.29)

5 Analysis

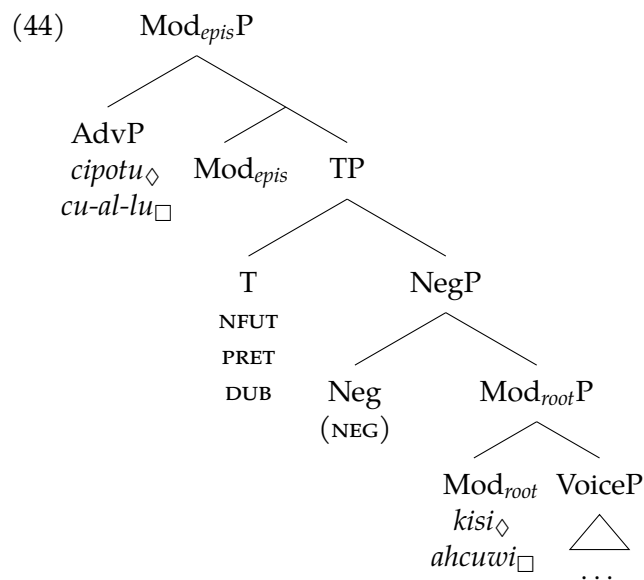
- ◆ First, here's an **empirical summary**:

		Classification		Tense			Negation	
	Syntax	Flavor	Force	T » MOD	MOD » T	¬ » MOD	MOD » ¬	
<i>kisi-</i>	initial/preverb	root	◇	✓	(untested)	✓	✗	
<i>ahcuwi-</i>	initial/preverb	root	□	✓	✗	✓	✗	
<i>cipotu</i>	high adverb	epistemic	◇	✗	✓	✗	✓	
<i>cu-al-lu</i>	high adverb	epistemic	□	N/A	✓	✗	✓	

5.1 Syntax

- ◆ In terms of the **syntax**, I propose the following, with everything interpreted *in situ*:
- ◆ Tense being above negation is motivated by the fact that tense marking is outside of negative marking on the verb:

(43) ma opi-wi-Ø-hpon
 NEG sit_{AI-NEG-3-PRET}
 'she didn't sit'



- ◆ This correctly derives the **co-occurrence possibilities** of modals (with NEG)—epistemic modals scope over root modals, and negation (if present) goes between:

- (45) a. *Context: You see a patch of fertile soil. You surmise:*
Cu-al-lu sahti-yil **kisi-kon-Ø-ul** yuta.
must.be blueberries-IN.PL **can-grow**_{II-3-IN.PL} here
 ‘Blueberries **must be able** to grow here.’ $\Box_{epis} \gg \Diamond_{circ}$ (GP, RP 2020.07.08)
- b. *Context: We’ve been invited to a ceremony, and I don’t know if women are required to wear dresses there, or if it’s just recommended.*
Cipotuk ma=te ehpicik ‘-cuwi= psihkom-uw-oni-ya-l
maybe NEG=EMPH woman.PROX.PL 3-must= wear_{II-NEG-N-PL-IN.PL}
 Ø-mahkut-uwa-l.
 3-dress-PL-IN.PL
 ‘Women **might not have to** wear dresses.’ $\Diamond_{epis} \gg \neg \gg \Box_{deon}$ (EM 2024.04.22)

5.2 Semantics

- ◆ **Types:** t is the type of truth values, i is the type of times, and s is the type of worlds.
- ◆ I assume a **pronominal theory of tense**, with distinct tense specifications being **presuppositions** on a null tense pronoun:

- (46) Assumptions about tense in PW
- a. $\llbracket \text{NFUT} \rrbracket^{c,g,f,h} = \lambda t_i : t \preceq t_c \cdot t$ \rightsquigarrow unmarked tense
- b. $\llbracket \text{PST} \rrbracket^{c,g,f,h} = \lambda t_i : t \prec t_c \cdot t$ \rightsquigarrow (dubitative) preterit tense⁸

- ◆ For **modals**, I assume a relatively standard **Kratzerian semantics** involving quantification over accessible worlds, with the accessibility relation provided by a combination of a **modal base** f “filtered” by an **ordering source** h .

(Kratzer 1981, 2012, Portner 2009, von Stechow 2011, Heim 2011, a.m.o.)

- ▶ For simplicity, I’ll treat f and h as **contextual parameters** of the interpretation function $\llbracket \cdot \rrbracket^{c,g,f,h}$, but this isn’t crucial (e.g. they could be variables in the object language).
- ◆ The modal base is either **epistemic** (a set of propositions that the judge/speaker knows/believes), or **circumstantial** (a set of propositions that are true of the world of evaluation).
 - ▶ I assume that modal bases are relativized to (at least) a **world** and a **time**: $f(w, t)$.
- ◆ Out of the grand intersection of the propositions in the modal base $\cap f(w, t)$, the ordering source $h(w, t)$ (a set of propositions) picks out the most **highly ranked**, “best” worlds compatible the greatest number of propositions in the ordering source.

(see Portner 2009, von Stechow 2011, and Kratzer 2012 for more formal details)

⁸For simplicity, I abstract away from the distinction between the preterit and the dubitative preterit, assuming that they both involve this particular past tense component. I leave closer investigation of the preterit/dubitative preterit contrast for future research.

- ▶ I write the resulting set of worlds as follows: $BEST_{h(w_1, t_1)}(f(w_2, t_2))$
- ▶ Ordering sources can be **deontic** (a set of rules), **bouletic** (a set of desires), **teleological** (a set of goals), **stereotypical/normal** (a set of “typical” natural laws), etc.
- ♦ For PW **root modals**, I propose that they take a **temporally unsaturated proposition** (type *ist*) as an argument, and output **another temporally unsaturated proposition** (which can then take tense as an argument).

- (47) a. $\llbracket kisi \rrbracket^{c, g, f, h}$ is only defined if f is a circumstantial modal base.
 If defined, $\llbracket kisi \rrbracket^{c, g, f, h} = \lambda P_{ist}. \lambda t. \lambda w. \exists w' \in BEST_{h(w, t)}(f(w, t)), P(t)(w')$
- b. $\llbracket ahcuwi \rrbracket^{c, g, f, h}$ is only defined if f is a circumstantial modal base.
 If defined, $\llbracket ahcuwi \rrbracket^{c, g, f, h} = \lambda P_{ist}. \lambda t. \lambda w. \forall w' \in BEST_{h(w, t)}(f(w, t)), P(t)(w')$

- ♦ For PW **epistemic modals**, I propose that they take **propositions** (type *st*) as an argument, output another proposition, and their modal base and ordering source are anchored to the **time of evaluation** t_c .

- (48) a. $\llbracket cipotu \rrbracket^{c, g, f, h}$ is only defined if f is an epistemic modal base.
 If defined, $\llbracket cipotu \rrbracket^{c, g, f, h} = \lambda p_{st}. \lambda w. \exists w' \in BEST_{h(w, t_c)}(f(w, t_c)), p(w')$
- b. $\llbracket cu-al-lu \rrbracket^{c, g, f, h}$ is only defined if f is an epistemic modal base.
 If defined, $\llbracket cu-al-lu \rrbracket^{c, g, f, h} = \lambda p_{st}. \lambda w. \forall w' \in BEST_{h(w, t_c)}(f(w, t_c)), p(w')$

5.2.1 A note on temporal orientation

- ♦ PW root modals are **obligatorily future-shifting**. (even with priority modals, (39))
 - ♦ One way of capturing this is to posit (null) **prospective** (or non-perfect) **aspect** underneath the modal. (see Rullmann and Matthewson 2018 for discussion)
- (49) a. $\llbracket PROSP \rrbracket^{c, g, f, h} = \lambda P_{ist}. \lambda t. \lambda w. \exists t' \succ t, P(t')(w)$
 b. $\llbracket NPERF \rrbracket^{c, g, f, h} = \lambda P_{ist}. \lambda t. \lambda w. \exists t' \succeq t, P(t')(w)$
- ▶ This would need to be augmented with a constraint **banning perfect/nonprospective aspect** under root modals in PW. (e.g. some version of the Diversity Condition)
- ♦ Alternatively, we can **build in** future-shifting: (e.g. Condoravdi 2002)
- (50) a. $\llbracket kisi \rrbracket^{c, g, f, h}$ is only defined if f is a circumstantial modal base.
 If defined,
 $\llbracket kisi \rrbracket^{c, g, f, h} = \lambda P_{ist}. \lambda t. \lambda w. \exists w' \in BEST_{h(w, t)}(f(w, t)), \exists t' \succeq t, P(t')(w')$
- b. $\llbracket ahcuwi \rrbracket^{c, g, f, h}$ is only defined if f is a circumstantial modal base.
 If defined,
 $\llbracket ahcuwi \rrbracket^{c, g, f, h} = \lambda P_{ist}. \lambda t. \lambda w. \forall w' \in BEST_{h(w, t)}(f(w, t)), \exists t' \succeq t, P(t')(w')$
- ♦ I remain agnostic about these two possibilities here.

6 Conclusion

- ◆ I set a solid **empirical foundation** for future work on modality in PW:
 - ▶ PW modals distinguish both **force** and **flavor**;
 - ▶ PW root modals are **initials/preverbs**, lower than T and Neg;
 - ▶ PW epistemic modals are **high adverbs**, higher than T and Neg;
 - ▶ PW root modals scope **under tense and negation**;
 - ▶ PW epistemic modals scope **over tense and negation**.
- ◆ I provided a **formal analysis of PW modals** that works with the syntax to derive these properties, using a standard Kratzerian semantics for modality.
(+ insights on modal-temporal interaction from Condoravdi 2002 and Rullmann and Matthewson 2018)

6.1 Ramifications

- ◆ Here are some consequences for **existing theories** of the **syntax and semantics of modals**.
 - ▶ PW provides straightforward evidence for root modals being first Merged **below negation**, since they can only scope under negation (even *ahcuwi-* ‘must’!).
(Iatridou and Zeijlstra 2013, Jeretič 2021, a.o.)
 - ▶ PW verifies the hypothesis that root modals are Merged **under tense**.
(Picallo 1990, Condoravdi 2002, Stowell 2004, Rullmann and Matthewson 2018, a.o.)
 - ▶ PW verifies the hypothesis that **epistemic modals are higher than root modals**.
(Picallo 1990, Cinque 1999, Stowell 2004, Hacquard 2006, 2010, a.o.)
 - ▶ PW verifies the hypothesis that epistemic modals—**at least adverbial ones**—scope **over tense**.
(Hacquard 2006, 2010, Chen et al. 2017, Rullmann and Matthewson 2018, a.o.)
 - While many propose that epistemic modals *universally* scope over tense, Chen et al. (2017) show that in many languages epistemic modals **can** actually scope under tense, with possible exception of **adverbial modals**.
 - **English** provides a nice illustration of this, with *might vs. maybe*.
(51) *Context: Your friend Pat is wondering why you bought a bone for his pet snake. When you bought the bone, you didn’t know what kind of animal he had, and you bought it because he might have had a dog, for all you knew back then.*
 - a. You **might have** had a dog.
 - b. **#Maybe** you have a dog.
 - Since PW epistemic modals are **high adverbs**, they **can’t scope under tense**.

6.2 Root possibility – perfect(ive) ambiguity

- ◆ *Kisi-* is **ambiguous** between a **modal** and **perfect/perfective** reading:

(52) *Context: Peter’s mother is very strict—she only allows him to have ice cream on Mondays. On Monday, Peter didn’t actually eat any ice cream. Today is Tuesday, and he says:*
 Wolaku **n-kis-otom-on** tekcokek, kenoq ma-te **n-kis-otom-uw-on**.
 yesterday **1-can-eat_{TI-N}** ice.cream but **NEG=EMPH 1-PFV-eat_{TI-NEG-N}**
 ‘Yesterday I could eat ice cream, but I didn’t.’ (GP, RP 2020.11.17)

► As far as I am aware, there is **no morphosyntactic difference** between these two uses.

- ◆ This bears a striking similarity to **actuality entailments** with ability modals, **but**: those imply some **effort** on the part of the subject—**not so in PW!**

(Bhatt 1999, Hacquard 2006, 2009, a.o.)

(53) a. **Kis-olan-Ø** wolaku.
PFV-rain_{II-3} yesterday
 ‘It rained yesterday.’ (EM 2021.10.06)

b. #Ayer **ha** **podido** llover.
 yesterday **have.3SG can.PPT** rain.INF
 Intended: ‘It rained yesterday.’ (Remus Călin Zetu, p.c.)
 (NB: OK under an epistemic reading)

- ◆ This is **not a PW-specific thing**—we find this in **other Algonquian languages** in the northeast, like **Innu** (Central Algonquian) with the cognate *tshî* (<PA *ki·š-, ‘finish’):

(54) Innu (examples from the online dictionary: <https://dictionary.innu-aimun.ca/>)

a. *Modal reading*
 “Ashinî **tshî** kuetipî-u,” ite-pan-at tshishe-ñnu-at.
 rock **can** change.position_{AI-3} say_{AI-PRET-PROX.PL} old-person-PROX.PL
 “‘A rock can change position by itself,’ the elders used to say.’ (entry: *kuetipiu*)

b. *Temporal reading*
 Pâtush **tshî** mishta- nûti-k-i tshika pâkushkâshtan-Ø.
 after **PFV** big- wind_{II-CJ-SBJV} FUT plant.dry.in.wind_{II-3}
 ‘After a strong wind will have blown, the vegetation will be dried out’
 (entry: *pakushkashtan*)

- ◆ We also find a similar phenomenon in **Hmong**, but with a **fun syntactic difference**:

(Li 1991, Enfield 2003)

(55) Hmong
 a. Naagmo cov txiv **tau** lwj. b. Kuv **has** **tau** lug moob.
 yesterday PL fruit **TAU** rotten 1SG **speak** **TAU** CL Hmong
 ‘Yesterday the fruit was rotten.’ ‘I can speak Hmong.’ (Li 1991:33–35)

► **Preverbal = temporal, postverbal = modal!** A clue for PW/Innu?

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