Analyzing ʔayʔaǰuθəm evidentials: Evidence for epistemic modality

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1 Introduction

In this chapter, I argue that two evidential clitics in ʔayʔaǰuθəm, a Central Salish language, are epistemic modals.[1] Both of these evidentials, an inferential clitic *c̓ɛ̓* and a reportative clitic *k̓ʷa*, contribute a strong modal claim to the at-issue content of the clause and an evidential presupposition. ʔayʔaǰuθəm evidentials thus provide counterevidence to the claim that evidentiality and epistemic modality are non-overlapping categories (De Haan 1999; Aikhenvald 2004); instead, these evidentials provide additional evidence that at least some evidentials are epistemic modals (Matthewson et al. 2007; Peterson 2010; Tan Almazán 2019 a.o.; see Matthewson 2012 for arguments that all evidentials are epistemic modals). Since the commonly used diagnostics for distinguishing between modal and nonmodal evidentials have all been criticized (e.g. Korotkova 2016), a major focus of this chapter is identifying which diagnostics can be used to argue for a modal (or nonmodal) analysis and how they can be implemented in a fieldwork situation.

ʔayʔaǰuθəm is the northernmost of the chain of languages making up the Central Salish branch of the Salish language family. The language is traditionally spoken in the Tla'amin, Homalco, Klahoose, and Kómoks First Nations, along the northern part of the Georgia Straight in British Columbia. According to the 2018 First Peoples' Cultural Council report, there are approximately 47 first language speakers remaining. Determined efforts are underway within the four communities to document and transmit the language to future generations.

Reisinger (2018) provides an overview of elements suspected to be modal in ʔayʔaǰuθəm, including the two evidentials discussed here. While he provides much interesting documentation, however, he assumes, rather than establishes, the modality of these evidentials. My goal in this paper is to provide empirical support for the claim that these elements are epistemic modals. All data in this chapter comes from original

[1]I want to thank my consultants for sharing their language with me so patiently and generously; without their heroic dedication to their language, this work would not be possible. In particular, I would like to thank Elsie Paul, Freddie Louie, Betty Wilson, and Joanne Francis for their contributions to this chapter: čɛčɛ̓hatanapɛč! I would also like to thank Lisa Matthewson, Henry Davis, Gunnar Hansson, and two anonymous reviewers for their very helpful feedback, as well as Daniel Reisinger with whom I discussed many of these topics. All errors are my own.

fieldwork using methodologies advocated in, for example, Matthewson (2004) and Bochnak and Matthewson (2015).

The two evidential particles discussed in this paper are second-position clitics. The inferential clitic *čˀɛ* indicates that the speaker is making an inference in uttering the prejacent, while the reportative clitic *kʷˀa* indicates that the speaker heard the prejacent from a third party. These clitics are members of a large set of clitics that appear in a fixed order following the initial prosodic word in the clause (see Watanabe 2003, 509–531 for the most extensive previous description of the ʔayʔaǰuθəm second-position clitic system). The clitic string includes indicators of force, evidentiality, and temporal reference, as well as subject agreement clitics and discourse particles.[2] Table 1 shows the inventory of clitics arranged according to their position in the clitic string; the clitics are represented in their underlying forms (but note that I will be using the orthographic forms to represent the evidential clitics in the text throughout the chapter).[3]

Table 1: ʔayʔaǰuθəm 2PCs and ordering

Force		Subject		Evid		Fut		ClDem		Other	
a	'Q'	č (čan)	'1SG.SBJ'	**čˀa**	'INFER'	səm/saʔ	'FUT'	kʷi	'CL.DEM'	ga	'DPRT'
ala	'EXCLAM'	čxʷ (čaxʷ)	'2SG.SBJ'	**kʷˀa**	'RPT'			kʷa	'CL.DEM'	ʔut	'EXCL'
		št (čat)	'1PL.SBJ'					ti	'CL.DEM'	hiyt	'DPRT'
		čap	'2PL.SBJ'					ta	'CL.DEM'	χʷuʔt	'DPRT'
										qəɬ	'IRR'

As can be seen from the table above (see also (1a) and (1b) below), *čˀɛ* and *kʷˀa* both occur following the question clitic and preceding the future clitic.[4]

[2]The glosses used in this paper are as follows: 1 = first person, 2 = second person, 3 = third person, ACT.INTR = active intransitive, CAUS = causative, CHAR = characteristic reduplication, CL.DEM = clausal demonstrative, CNJ = conjunctive, COMP = complementizer, CONJ = conjunction, COP = copula, CTR = control transitive, DEM = demonstrative, DET = determiner, DPRT = discourse particle, EPST = epistemic uncertainty, ERG = ergative, EXCL = exclusive, EXCLAM = exclamative, FUT = future, IND = indicative, INFER = inferential, INT = intensifier, IRR = irrealis, MD = middle, NCTR = non-control transitive, NEG = negative, NMLZ = nominalizer, OBJ = object, OBL = oblique, PASS = passive, PL = plural, POSS = possessive, PRF = perfect, PROG = progressive, PRT = particle, PST = past, Q = question particle, REFL = reflexive, REL = relative, REP = reportative, RPT = reportative, SBJ = subject, SG = singular, STAT = stative, SUBJ = subjunctive. A hyphen (-) is used to represent morpheme boundaries within words, an equals sign (=) is used to represent clitic boundaries, and a plus sign (+) is used where two co-occurring morphemes fuse in a way that is not predictable from the phonology. 'vf' (volunteered form) following an example indicates that the form was volunteered by the consultant. 'sf' (suggested form) following an example indicates that the researcher constructed the example and then asked if it was grammatical and/or appropriate in a given context.

[3]Watanabe (2003) includes several additional clitics which I take to be contractions of the clitics listed here. I also only include indicative subject agreement in the table, but there are subjunctive and possessive subject clitics that occupy the same position and occur in embedded clauses.

[4]Each example in this paper is represented both in the ʔayʔaǰuθəm orthography (the first line under the context) and in a roughly phonemic representation with morpheme breaks (the line following the orthographic representation).

(1) a. *Context: It's very cloudy out.*

ċ̓ɬa **č̓ɛ** səm?

ċ̓əɬ=a=**č̓a**=səm

rain=Q=INFER=FUT

'I wonder if it will rain.' vf

b. *Context: I missed the news, but I know that you listened to the news.*

ċ̓ɬa **k̓ʷa** səm snat?

ċ̓əɬ=a=**k̓ʷa**=səm snat

rain=Q=RPT=FUT tonight

'Is it going to rain tonight (according to the report)?' vf

The inferential and reportative clitics cannot co-occur ((1c–d, cf. (1e–f)), suggesting that they occupy the same syntactic position.[5] I assume that this is a head in the upper part of the clause between TP and CP.

(3) a. *ho **č̓ɛ k̓ʷa** səm.

hu=**č̓a**=**k̓ʷa**=səm

ho=INFER=RPT=FUT

Intended: 'I'm guessing they said he would go.' sf

b. *ho **k̓ʷa č̓ɛ** səm.

*hu=**k̓ʷa**=**č̓a**=səm

ho=RPT=INFER=FUT

Intended: 'They said they thought he would go.' sf

[5] An anonymous reviewer asks if the restrictions on co-occurrence could be semantic as well as syntactic. One can imagine a situation where the speaker has reported evidence that *p*, but due to conflicting evidence or a conflicting report must take additional knowledge into account to infer whether *p* is true. This would seem to be a case where semantically both evidentials would be licensed. Even in such cases, however, co-occurrence is impossible.

(2) *Context: There's a dispute about whether Freddie is home or in Vancouver. My sister said she saw Freddie at the store, but my brother insists that he is still in Vancouver. I trust my sister in these things more than my brother, so when discussing later with you, I say:*

*č̓ɛ k̓ʷakʷa	qʷol	hɛwt	Freddie.
č̓a=k̓ʷa=kʷa	qʷəl̓	hiwt	Freddie
INFER=RPT=CL.DEM	come	get.home	Freddie

'Freddie must be home.'

I therefore take this restriction to be syntactic rather than semantic in nature.

c. ho **k̓ʷa** səm.
hu=**k̓ʷa**=səm
go=RPT=FUT
'They say he'll go.' sf

d. ho **č̓ɛ** səm.
hu=**č̓a**=səm
go=INFER=FUT
'I guess he'll go.' sf

Evidential marking does not appear in every clause in ʔayʔaǰuθəm. *č̓ɛ* and *k̓ʷa* occur frequently, however, and are preferred where the context supports their use. Unmarked clauses are usually interpreted as based on direct evidence, but this does not seem to be obligatorily the case. I therefore do not propose a null direct evidential in the paradigm. The quasi-obligariness is consistent with an analysis where absence of *č̓ɛ* and *k̓ʷa* implies (through a quantity implicature, e.g. Grice 1989), rather than encodes, direct evidence.[6]

For the semantic contribution of *č̓ɛ* and *k̓ʷa*, I adopt von Fintel and Gillies's (2010) approach to epistemic modals. von Fintel and Gillies argue that all epistemic modals are evidentials which signal that the speaker bases the prejacent on inference rather than direct evidence. This is captured through a presupposition that the speaker's direct information does not settle whether the prejacent is true.[7] I adopt their denotation for English *must* to capture the meaning of the inferential *č̓ɛ*. The reportative *k̓ʷa* requires some additional content for which I follow Matthewson's (2010) adaption of von Fintel and Gillies's proposal for the St'át'imcets reportative *ku7*. She proposes that the reportative carries an additional presupposition that the prejacent known through a report. She also proposes that reportative requires a differentiation between the speaker's direct sensory information and general knowledge. The inferential cannot be used with a prejacent that is general knowledge, since general knowledge counts as direct information (cf. English # *The earth must be round.*). In contrast, the reportative is compatible with the prejacent being general knowledge learnt through report. Matthewson therefore proposes that the reportative's presupposition concerning the speaker's absence of direct information settling whether the prejacent is true only makes reference to the speaker's direct sensory information.

The remainder of this paper is organized as follows. Section 2 provides background on modal and nonmodal approaches to evidentials. In Section 3, I identify diagnostics for distinguishing between modal and nonmodal evidentials and discuss the results of implementing these diagnostics for the inferential and reportative evidentials in ʔayʔaǰuθəm. In Section 4, I discuss the use of these evidentials in questions and

[6]According to Aikhenvald (2007) only obligatory markers of evidence source can be classified as evidentials – that is, only languages where evidentiality is obligatorily marked in every clause can be said to have evidentials. Most classifications are less stringent, however. Brugman and Macaulay (2015), for instance, argue that evidentials are morphemes that mark source of evidence for the embedded proposition and are members in grammatical systems. Insofar as the ʔayʔaǰuθəm evidential clitics form a closed 'grammatical system', these clitics are straightforwardly classified as evidentials.

[7]By presupposition here, I am referring to a non-cancellable, non-at-issue contribution that projects. I am not claiming that modals in ʔayʔaǰuθəm involve Common Ground restrictions. Salish languages are known for not placing restrictions on the Common Ground (Matthewson 1998, 2005; Gillon 2006; Huijsmans et al. 2018).

address potential counter-evidence for a modal analysis. Finally, in Section 5, I propose a formal analysis of the two evidentials adopting von Fintel and Gillies's (2010) framework for epistemic modals.

2 Modality and evidentiality

There is an obvious link between indirect evidentiality and epistemic modality; both indicate that the speaker infers the truth of the prejacent from indirect information. The presence of this link has generated debate about the relationship between evidentials and epistemic modals, at least since Izvorksi's (1997) seminal modal analysis of the Bulgarian perfect of evidentiality. Evidentials emerged as a prominent topic in linguistics in the 1980's and 1990's in part through typological studies such as Willett (1998) and De Haan (1999). De Haan (1999) and later Aikhenvald (2004) argued that evidentials are a distinct category from epistemic modals and that the two categories do not overlap. In the formal semantics literature, Izvorski (1997), followed by others such as Garrett (2001), Faller (2002), and Matthewson et al. (2007), proposed that at least some evidentials are best analyzed as epistemic modals. Matthewson (2012) takes the strong position that all evidentials are epistemic modals and vice versa, while von Fintel and Gillies (2010) and Kratzer (2012) take the slightly weaker position that epistemic modals are evidentials (but evidentials need not be epistemic modals).

Faller's 2002 dissertation emerges as an important contribution to this discussion because she develops a nonmodal formal model for analyzing evidentials (see also Garrett 2001), proposing that they can be illocutionary operators, rather than epistemic modals. She argues that modal and non-modal evidentials co-exist in the same paradigm in Cuzco Quechua (see also Garrett 2001 for Tibetan and Peterson 2010 for Gitksan): she analyzes the conjectural evidential as an epistemic modal, but the reportative and direct evidentials as nonmodal evidentials. She proposes that the reportative and direct evidentials modify the sincerity conditions and/or illocutionary force of the speech act. Murray (2010) later also develops a nonmodal analysis of the evidentials in Cheyenne; she proposes that the evidentials contribute not-at-issue content concerning the source of evidence, and an illocutionary relation concerning how/whether to update the common ground with the scope proposition.

Empirically, the modal and nonmodal approaches make different predictions. In the modal approach, the speaker is committed to a modal claim concerning the prejacent: that it is possibly or necessarily true. Modal evidentials are therefore predicted to alter the at-issue content and truth conditions of the proposition. Illocutionary evidentials, on the other hand, make no at-issue contribution and do not alter the truth conditions. They can, however, change the illocutionary force of the speech act. Below, I briefly present an analysis under each approach to illustrate the key aspects of the different analyses before identifying diagnostics that can distinguish between them.

2.1 A modal analysis of evidentials

Izvorski (1997), discussing the Bulgarian perfect of evidentiality, provides the first modal analysis of an evidential. The Bulgarian perfect of evidentiality is used when the speaker has indirect evidence for the prejacent, and is infelicitous where the speaker has direct evidence. It is therefore infelicitous with following assertions to the effect that the speaker has prior direct information that the prejacent is true (4).[8]

(4) Maria celunala Ivan.
Maria kiss-PE Ivan
'Maria apparently kissed Ivan.'
(Actually) I witnessed it. / # (Actually) I know that for a fact. (Izvorski 1997, 228)

Izvorski proposes that this evidential is an epistemic modal with an added presupposition that the speaker has indirect evidence for the embedded proposition.

(5) a. Presupposition: The speaker has indirect evidence for p.
b. Assertion: $\Box$ p in view of the speaker's knowledge state. (Izvorski 1997, 226)

In this analysis, the modal base is the set of worlds in which all the propositions considered evidence in w are true (Izvorski 1997, 230). The ordering source ranks the worlds of the modal base according to how many of the set of propositions believed by the speaker concerning the available indirect evidence are true in that world (e.g. propositions concerning what the speaker believes about the likelihood of the prejacent given some evidence proposition in the modal base). Crucially, the modal claim in Izvorksi's analysis is at-issue, while the evidential contribution is presupposed.

2.2 An illocutionary analysis of evidentials

Faller (2002) analyzes the direct and reportative evidentials in Cuzco Quechua as illocutionary operators. She adopts Vanderveken (1990)'s approach to speech acts, analyzing the evidentials as playing a role in determining the illocutionary point, sincerity conditions, and strength of speech acts. In Vanderveken's (1990) theory, every speech act has an illocutionary force (e.g. assertion, directive, commissive) determined by six components: the illocutionary point, mode of achievement, propositional content conditions, preparatory conditions, sincerity conditions, and strength. The illocutionary point of a speech act specifies its word-to-world relation: assertions match or describe the world, while directives attempt to change to world to match the propositional content, for instance. The sincerity condition of a speech act requires that the speaker has the mental state expressed in the performance of the speech act; if a sentence has the illocutionary force of an assertion, for instance, there is a sincerity condition that the speaker must believe the proposition to be true. Strength is a property of this mental state, playing a role in distinguishing between

[8] As discussed in Smirnova (2013), the Bulgarian perfect of evidentiality can in fact be used with direct evidence, but then it expresses mirativity.

giving testimony and making a conjecture, for instance, because the speaker's degree of belief differs between them. For Faller, the evidentials impose sincerity conditions to do with the speaker's information source. The reportative also affects the illocutionary force of the speech act, while the direct evidential affects the 'strength' of the speech act.

To illustrate, when the direct evidential *-mi* combines with a speech act *ASSERT(p)*, the illocutionary point remains one of assertion, but the direct evidential adds a sincerity condition that the speaker must have the 'best possible grounds' for uttering *p*, usually seeing the event e_p described by *p*. Use of *-mi* also strengthens the assertion (from a default value 0 to +1).

(6) Para-sha-n-**mi**.
rain-PROG-3-MI
p = 'It is raining.'
ILL = $\text{ASSERT}_s(p)$
SINC = { $Bel(s, p)$, EV = $See(s, e_p)$ }
STRENGTH = +1 (Faller 2002, 164)

When the reportative evidential *-si* combines with a speech act *ASSERT(p)*, it alters the illocutionary point to one of presentation, rather than assertion, meaning that the speaker does not claim the propositional content to fit the world, but simply presents the propositional content to the hearer. The use of the reportative also adds a sincerity condition such that a third party asserted *p*.[9]

(7) Para-sha-n-**si**.
rain-PROG-3-SI
p = 'It is raining.'
ILL = $\text{PRESENT}_s(p)$
SINC = { $\exists s_2[\text{ASSERT}(s_2, p) \wedge s_2 \notin \{h,s\}]$ } (Faller 2002, 199)
(where *s* = speaker, *h* = hearer, s_2 = source of the report)

The illocutionary point of presentation allows the speaker to utter *p* based on another person's report without believing the report to be true, as in (8).

(8) Para-sha-n-**si**, ichaqa mana crei-ni-chu.
rain-PROG-3-SI but not believe-1-NEG
p = 'It is raining, but I don't believe it.'

Crucially, the analysis of evidentials as illocutionary operators means that the evidentials do not contribute to the at-issue content of the clause, though they may affect the illocutionary force of the utterance.

[9]Because the utterance has the illocutionary point of *presentation*, the speech act must also have a different illocutionary force than an assertion. This is because the illocutionary force of a speech act is determined by its components, and only when all the components are identical is the same type of illocutionary force expressed (Vanderveken 2001, 28). Faller therefore introduces a new type of speech act: PRESENT (Faller 2002, 199).

3 Applying diagnostics in ʔayʔaǰuθəm

In this section, I first identify diagnostics for modal and nonmodal evidentials (Section 3.1). These diagnostics involve testing whether the evidential can take scope relative other at-issue content, whether the evidential contributes a modal claim that can be challenged, and the effect the evidential has on the entailments of the prejacent through examining possible continuations. I then discuss the implementation and results of the diagnostics for ʔayʔaǰuθəm (Section 3.2). I find that ʔayʔaǰuθəm evidentials can embed under attitude verbs, contribute a modal claim that can be challenged, and alter the entailments of the prejacent in manner consistent with a modal claim.

3.1 Identifying diagnostics

The key to determining whether an evidential is modal or nonmodal involves determining 1) whether the at-issue contribution of an utterance with the evidential is a modal claim concerning *p* or the assertion/presentation of *p* itself, and, related to this, 2) whether the evidential operates at the propositional or illocutionary level. There are several empirical differences corresponding to these possibilities: 1) an illocutionary evidential may allow a speaker to utter *p* without committing even to the possibility of *p*, but with a modal evidential, the speaker must be committed at least to the possibility of *p*, 2) modal evidentials, but not illocutionary evidentials, should be able to take scope under other semantic operators, 3) the contribution of an illocutionary evidential cannot be challenged, since it is not at-issue (though the prejacent itself is), while the modal claim (but not the evidential presupposition) should be challengeable for a modal evidential, 4) when using a modal evidential, the speaker does not assert *p* to be true in the actual world, whereas when using an illocutionary evidential, the speaker asserts *p* to be true of the actual world (if making an assertion rather than presenting *p*); this affects possible continuations following *p*.

The first three of these diagnostics feature frequently in previous literature; however, these have been criticized as not actually differentiating modal from nonmodal evidentials (see Korotkova 2016 and Tan Almazán 2019 for overviews and discussion). Below, I discuss the objections to each of these three diagnostics and, where possible, the refinements required to satisfy these objections. The fourth diagnostic has not typically featured in discussions of evidentiality, and so is presented as a novel additional test.

Asserting vs. presenting The first major apparent difference between the two analyses is the possibility of uttering the proposition without asserting it, and therefore without committing even to its possibility, under an illocutionary analysis. Crosslinguistically, however, this possibility seems confined to reportative evidentials (AnderBois 2014; Smirnova 2013), rather than being available more generally for evidentials analyzed as illocutionary operators. Moreover, at least some reportative evidentials that have been analyzed as modal (AnderBois 2014; Smirnova 2013; Tan Almazán 2019) allow for this behavior. AnderBois (2014) therefore proposes that that reportatives have the ability to facilitate perspective shift (e.g. Harris and Potts 2009). Perspective shift is a pragmatic phenomenon which occurs when the speaker utters a proposition from a salient viewpoint other than their own. For instance, despite the fact that appositives are typically

speaker-oriented, the underlined appositive in the short narrative below from Harris and Potts (2009, 527) clearly represents Joan's viewpoint, not the narrator's.

(9) Joan is crazy. She's hallucinating that some geniuses in Silicon Valley have invented a new brain chip that's been installed in her left temporal lobe and permits her to speak any of a number of languages she's never studied. Joan believes that her chip, which was installed last month, has a twelve year guarantee.

Perspective shift can only occur when there is another salient viewpoint in the context. AnderBois's proposal is that reportatives introduce another salient perspective – that of the reporter, the one who originally asserted the proposition. Because the reportative makes this additional perspective salient, the speaker is able utter the proposition taking the perspective of the reporter. The at-issue content of the utterance is then attributed to the reporter, not the speaker. This allows the speaker to utter the proposition without believing it. Since perspective shift is compatible with modal as well as illocutionary elements, the ability to utter the proposition without believing it true does not straightforwardly rule out a modal analysis of a reportative evidential.[10]

Taking scope The next key prediction is that illocutionary evidentials should not be able to take scope under at-issue operators since their contribution is not-at-issue, whereas modal evidentials should be able to take scope under other at-issue content. Assuming that illocutionary evidentials realize a functional head contributing illocutionary force, illocutionary evidentials should also only occur in root clause environments, limiting their syntactic distribution as well. There are several embedding environments to consider: 1) under negation, 2) in the antecedent of conditionals, and 3) under attitude predicates.

The negation of at-issue content should have clear interpretive effects, making this an attractive test for semantic embedding; however, in a variety of unrelated languages, epistemic modals seem to resist embedding under negation. This is true of both English (Horn 1989, 259ff) and S'tát'imcets (Matthewson et al. 2007), for example. The necessity modal in (10a) can only be interpreted as scoping over negation, for instance, and a bi-clausal structure is required for the opposite scope (10b).[11]

(10) a. He must not be home. $\Box > \neg$, $* \neg > \Box$

b. It's not the case that he must be home. $* \Box > \neg$, $\neg > \Box$

Therefore, if an evidential can embed semantically under negation, this is good evidence that it is modal, but if it cannot, nothing can be concluded. Syntactically, illocutionary evidentials are also expected to occur in matrix clauses like (10), but should not be able to take scope semantically under negation, so interpretation is key.

[10] This property of reportatives could be implemented (under a modal analysis) by proposing that reportatives can have an informational, rather than realistic, modal base (Kratzer 2012, 33–34); see Matthewson (2012) for a proposal to this effect. I will adopt a variation of this approach in Section 5.

[11] See Hacquard (2006) for arguments that epistemic modals scope high in the clause because they are speaker-oriented and associated with the speech act domain (but still contribute to the at-issue content of the clause).

Testing for embedding in the antecedent of a conditional is a similar case. This is an environment where strong epistemic modals tend to be dispreferred in English, as shown in (11a), and epistemic modals in general may be disallowed, as in St'át'imcets (Matthewson et al. 2007).

(11) *Context: We're going to drive by and see if it looks like Freddie is home.*

a. * If he must be home, we'll knock on the door.

b. If he might be home, we'll knock on the door.

However, since antecedents of conditionals are not typically root clause environments (except in Austinian ('biscuit') conditionals (Krifka 2014)), if an evidential can embed syntactically and semantically in the antecedent of a conditional, this is good evidence that it is modal.

Our final test for whether evidentials can take scope under at-issue operators involves embedding under attitude predicates. There are complications to using this test to distinguish between illocutionary and modal evidentials, however. It has been argued that certain attitude predicates, in particular verbs of saying, can embed root clauses, which correspond semantically to illocutionary acts (e.g. Hooper and Thompson 1973; Heycock 2006; Krifka 2014). In these environments, illocutionary operators should be able to embed syntactically and may be able to take scope semantically within the embedded speech act. According to Krifka (2014), for instance, embedding a root clause involves attributing a speech act to the matrix subject, which allows otherwise speaker-oriented material, such as speaker-oriented adverbs, to orient towards the matrix subject. This predicts even illocutionary evidentials to be able to orient towards matrix clause subjects in embedded root clauses.

The obvious solution is to test for embedding under predicates that do not allow embedded root clause complements. Unfortunately, environments that do and do not allow root clause embedding are not well defined cross-linguistically and diagnostics for identifying embedded root clauses (such as the availability of V2 in German) are often language-specific. This means that determining environments that may or may not embed root clauses is not trivial even in well-studied languages, let alone in understudied languages. Moreover, Anand and Hacquard (2013) argue that epistemic modals can only embed under a restricted set of attitude verbs: those which provide an information state that functions as the modal base for the embedded epistemic. These attitude verbs are typically doxastics (e.g. *say*, *think*), argumentatives (e.g. *claim*), and semifactives (e.g. *know*, *realize*), though weak epistemics can also embed under emotive doxastics (e.g. *fear*, *hope*) and dubitatives (e.g. *doubt*). Unfortunately for our purposes, these verbs, except for emotive doxastics and dubitatives, overlap with those claimed to be able to embed root clauses in English (Hooper and Thompson 1973). This means that embedding tests are fraught for all epistemic modals, but are particularly problematic for strong epistemic modals which, at least in English, can only embed under attitude verbs also claimed to embed root clauses.

Despite these complications, I consider embedding under attitude verbs still a worthwhile test. Not all evidentials analyzed as illocutionary operators are able to orient towards a matrix subject in this environ-

ment. In Cuzco Quechua, the reportative evidential is able to embed syntactically under verbs of saying, but when embedded in these environments, remains speaker-oriented (Faller 2014). This suggests that it may not be straightforward for illocutionary evidentials to take scope under attitude verbs, even if this is theoretically possible; modal evidentials, on the other hand, should straightforwardly take scope under attitude predicates. Therefore, if it is impossible for an evidential to ever take scope under attitude predicates, this could indicate that it is an illocutionary evidential, while the ability to scope under attitude predicates could support the claim that an evidential is modal, particularly if it can take scope under an attitude predicate that is unlikely to embed a root clause. The results of tests for embedding under attitude predicates must be interpreted carefully, however, and any argument from embedding should be corroborated by additional evidence.

Challengeability We turn now to challengeability as a test for whether an evidential contributes at-issue content. Our prediction is that the modal claim provided by a modal evidential may be challenged since it contributes to the at-issue content of the utterance, whereas only *p* itself can be challenged following a plain assertion embedded under an illocutionary evidential (see Matthewson et al. 2007; Matthewson 2012). Note that the validity of challengeability as a test has been questioned in previous literature (e.g. Murray 2010; Korotkova 2016; Tan Almazán 2019), since the evidential contribution cannot be challenged under either analysis (Matthewson et al. 2007; Matthewson 2012 also point this out). Under a modal analysis, this is because the evidential restriction takes the form of a presupposition, while under a speech act operator analysis, this is because the contribution of the evidential is generally not-at-issue. I agree with the assessment that challenging the evidential contribution cannot differentiate between the two analyses, but dispute the claim that this test cannot differentiate between the two analyses when targeting the at-issue content (see also e.g. Matthewson et al. 2007; Matthewson 2012 for arguments that this test can be used to distinguish between the two analyses).

Continuations Our final prediction concerns continuations following a proposition with an evidential. Since a modal claim does not assert the prejacent *p* to be true of the actual world, unlike a plain assertion of *p*, a continuation that relies on accepting *p* as true of the actual world should be felicitous following a plain assertion of *p* occurring with an illocutionary evidential, but not a modal claim about *p* involving a modal evidential. Test cases are discussed in the following section.

This give us three diagnostics to distinguish between modal and illocutionary analyses of evidentials: 1) it should be possible for a modal evidential to take scope under other at-issue operators, whereas an illocutionary evidential may not take scope semantically at all, or only take scope under attitude predicates embedding speech acts, 2) a modal evidential contributes an at-issue claim that can be challenged, whereas an illocutionary evidential does not contribute at-issue content, so that only *p* itself can be challenged, and 3) certain continuations should be impossible following a modal claim which are perfectly felicitous

following a plain assertion.[12] In the next section, I discuss the implementation of these tests in ʔayʔaǰuθəm.

3.2 Implementing diagnostics

In this section, I discuss the design of tests suitable for fieldwork using the three diagnostics identified in the preceding section. As argued elsewhere (Huijsmans In prep), *č̓ɛ* and *k̓ʷa* are strong modals, so the tests are designed with this in mind. The first diagnostic is embeddability. We consider three possible embedding environments: under negation, in the antecedent of conditionals, and under attitude predicates.

Embedding under negation: Because a modal evidential contributes to the at-issue content, it may be able to embed under negation, in which case the modal claim concerning the embedded proposition *p*, rather than *p* itself, is negated. Negating a strong modal claim has a truth conditional effect, equivalent to a weak modal scoping over negation.

(12) *Context: Two detectives are discussing which suspect is the thief.*
It's not the case that the gardener must have stolen it.
Logical equivalence: The gardener might not have stolen it (based on my indirect/reported evidence).
Implicature: There is a possibility that the gardener stole it.

The evidential *č̓ɛ* cannot embed under negation in ʔayʔaǰuθəm (this is also true of the evidential clitics in St'át'imcets, see Matthewson et al. 2007). When the evidential appears enclitic on negation, it is interpreted as scoping over negation (13), as in Context 1/Interpretation 1. It cannot be interpreted as scoping under negation, as in Context 2/Interpretation 2; if this were possible, following with *qəǰɛ čot nonpeganmɛt kʷʊnəs hɛɬ* 'I'm still thinking about whether it was him' should be felicitous, but it is not. As expected under both a modal and a nonmodal analysis, the evidential component cannot be targeted by negation, as in Context 3/Interpretation 3.

[12] In this chapter, I focus the discussion on distinguishing between modal and illocutionary evidentials since formal semantic analyses have been proposed for both types, giving rise to concrete predictions. Since the tests adopted here are largely focused on diagnosing whether the evidentials contribute at-issue content, however, they could in principle be used to distinguish between modal evidentials and any evidential without an at-issue contribution, such as an evidential that contributed only a presupposition.

(13) ✓*Context 1: The detective discovers the gardener has an alibi and now knows it can't have been the gardener that stole the necklace. He says: It must not have been the gardener who stole it.*
X Context 2: The detective had thought the gardener stole the necklace. Then he finds out the nephew had keys to the safe where the nephew was. Now he's not so sure. He thinks: It might not have been the gardener who stole it.
X Context 3: The detective realizes that all the evidence he had was faked. He says: There's no reason to infer the gardener stole it.

xʷaʔ **č̓ɛ**	hiyas	šɛ niš	ṗaṗɛm	kʷ matoł.	#qəǰɛč ʔot	nonpeganmɛt
xʷaʔ=**č̓a**	hiyas	šə=niš	ṗaṗim	kʷ=maʔ-t-uł.	qəǰi=č=ʔut	nunpigan-mi-t
NEG=INFER	be=3SUBJ	DET=be.here	work	DET=get-CTR-PST	still=1SG.SBJ=EXCL	think-REL-CTR

kʷʊnəs hɛł.
kʷən=as hił
DEM=3SUBJ be

✓Interpretation 1: 'It must not have been the gardener that took it. # I'm still thinking about whether it was him.'
X Interpretation 2: 'It might not have been the gardener. I'm still thinking about whether it was him.' (= 'It is not the case that it must have been the gardener...').
X Interpretation 3: 'There is no evidence that it was the gardener that took it. I'm still thinking about whether it was him.' sf

č̓ɛ also cannot follow the embedded predicate in order to scope under negation (14). Negation likely forms a biclausal construction in ʔayʔaǰuθəm, with negation acting as a predicate selecting for a subordinate subjunctive clause (Davis 2005); it is possible that the embedded clause does not have the full set of functional projections, so that the head hosting the evidential clitics is not projected making it impossible for the evidentials to appear within the embedded clause.

(14) *xʷaʔ hiyas **č̓ɛ** šɛ niš ṗaṗɛm kʷ matoł
xʷaʔ hiyas=**č̓a** šə=niš ṗaṗim kʷ=maʔtuł
NEG be=3SUBJ=INFER DET=be.here work DET=get-CTR-PST
Intended: 'It's not the case that it must have been the gardener that took it.' sf

The evidential *k̓ʷa* is usually interpreted as scoping over negation as well, as in Context 1/Interpretation 1 in (15). Unlike the inferential clitic, however, it also seems to be compatible with a context (Context 2) where the speaker cannot be sure of the truth of the negated prejacent – which would be compatible with the interpretation of a strong modal scoping under negation (Interpretation 2). However, as we will see below in the discussion of embedding under attitude predicates, *k̓ʷa* behaves in many respects as a strong modal, yet is compatible with the speaker not believing the prejacent to be true. Since this is possible even when *k̓ʷa* is not embedded under negation, the availability of this interpretation in (15) cannot be taken as evidence that

k̓ʷa is taking scope under negation; I will argue below that the availability of this interpretation is better explained in terms of perspective shift (AnderBois 2014). As expected for both modal and nonmodal evidentials, the evidential contribution cannot be targeted by negation (Context 3/Interpretation 3).

(15) ✓*Context 1: I heard from Freddie's daughter that Freddie didn't go to the elder's gathering this year. I'm letting you know he didn't go.*
✓*Context 2: I heard from an unreliable source that Freddie didn't go to the elders' gathering.*
X Context 3: You ask me if I've heard whether Freddie went go to the elder's gathering and I tell you I haven't heard.

xʷaʔ **k̓ʷa** θahasoɬ Freddie kʷ q̓aṯ̓θaws kʷ ƛ̓aχƛ̓aχay.
xʷaʔ=**k̓ʷa** θa=has-uɬ Freddie kʷ=q̓aṯ̓θ-aw-s kʷ=ƛ̓aχ∼ƛ̓aχay
NEG=RPT GO=3CNJ-PST Freddie DET=gather-PL-3POSS DET=PL∼elder
✓Interpretation 1: 'He didn't go to the elders' gathering (based on what I heard).'
✓Interpretation 2: 'He might not have gone to the elders' gathering (based on what I heard).' (= 'It is not the case that he must have gone to the elders' gathering (based on what I heard).')
X Interpretation 3: I didn't hear whether he went to the elders' gathering.' sf
Consultant's comment: You just heard he didn't go.

Just as with the inferential, the reportative cannot appear following the embedded predicate in order to take scope below negation (16).

(16) *xʷaʔ θahasoɬ **k̓ʷa** kʷ q̓aṯ̓θaws kʷ ƛ̓aχƛ̓aχay.
xʷaʔ θahasuɬ=**k̓ʷa** kʷ=q̓aṯ̓θ-aw-s kʷ=ƛ̓aχ∼ƛ̓aχay
NEG GO=3CNJ-PST=RPT DET=gather-PL-3POSS DET=PL∼elder
Intended: 'I heard he didn't go to the elders' gathering.' sf

The results from attempting to embed the two evidentials are therefore inconclusive. The inability to scope under negation is predicted for speech act evidentials, but also found for modal evidentials cross-linguistically. While the reportive looks as if it may be able to embed under negation in contrast to the inferential, its ability to appear in contexts where the speaker does not believe the prejacent true is a confound for interpreting this result.

Embedding in the antecedent of conditionals: Because a modal evidential contributes at-issue content, it may also be able to take scope within the antecedent of conditionals, as in (17). Embedding in this environment should not be semantically or syntactically available for illocutionary evidentials.[13]

[13]Except in biscuit conditionals (Krifka 2014).

(17) *Context: We've been meaning to visit Freddie and we're going to check if smoke is coming from his chimney so we can tell whether he's likely to be home.*
If Freddie ??must/might be home, we will drive over to his house.

The interpretation of (17) contrasts with the case where the modal scopes over the whole conditional (*It must be that if Freddie is home, we will drive over to his house*) or there is no modal (*If Freddie is home we will drive over to his house*). In both these cases, the speaker can have direct evidence that Freddie is home before driving over, whereas with the modal taking scope within the antecedent of the conditional, this is not possible. If an evidential can syntactically embed in the antecedent of a conditional, context can therefore be used to check its semantic scope.

Not all epistemic modals are able to semantically take scope in the antecedents of conditionals, however (as discussed in the previous section). This means that the results of this test are only conclusive where an evidential can semantically take scope in the antecedent of a conditional. In this case, the test indicates that the evidential contributes to the at-issue content, behaving as an epistemic modal. If an evidential cannot embed in the antecedent of a conditional, nothing can be concluded.

In ʔayʔaǰuθəm, the evidential clitics are not able to take scope in the antecedent of conditionals. This is parallel to what has been reported previously for evidential clitics in St'át'imcets (Matthewson et al. 2007).

(18) *Context: We were planning an outing, but we're going to check what it looks like outside before we leave.*

#ʔot **č̓ɛ** səm	č̓ɪɬ,	xʷaštəm	θahat.
ʔut=**č̓a**=səm	č̓əɬ,	xʷaʔ=štəm	θah=at
if=INFER=FUT	rain	NEG=1PLSBJ+FUT	go=1PL.SUBJ.SBJ

'If it must be going to rain, we won't go.' sf

(19) *Context: We were planning an outing, but we're going to check what the weather forecast says before we leave.*

#ʔot **k̓ʷa** səm	č̓ɪɬ,	xʷaštəm	θahat.
ʔut=**k̓ʷa**=səm	č̓əɬ,	xʷaʔ=štəm	θah=at
if=RPT=FUT	rain	NEG=1PLSBJ+FUT	go=1PL.SUBJ.SBJ

'If it's reportedly going to rain, we won't go.' sf

I have come across an example of *k̓ʷa* in the antecedent of a conditional in a text, as shown in (20), but it seems that the reportative is scoping out of the conditional in this case (i.e. 'It's said that if you didn't...'). Of course, this is expected for the evidential contribution which is presupposed, but the at-issue content also does not seem to be scoping within the conditional (if it did, it would mean something like: 'If based

on reported evidence you must not have done that, then...'). The speaker is discussing cultural teachings around what should be done when exiting the forest, so the 'report' is most plausibly the teachings which were passed on to her, which in this case take the form of a conditional. This means the reportative is semantically scoping over the whole conditional.

(20) ʔotčxʷ **k̓ʷa** xʷaʔ ʔəχtiysxʷaxʷ, nɛ **k̓ʷa** kʷʊθ qaymɪxʷanən ʔəxʷi kʷ θičum.
ʔut=čxʷ=**k̓ʷa** xʷaʔ ʔəχtiysxʷ=axʷ, niʔ=**k̓ʷa** kʷə=θ=qaymixʷanan ʔəxʷǰ kʷ=θičim
if=2SG.SBJ=RPT NEG do.like-CAUS=2SUBJ be.there=RPT DET=2SG.SBJ=spirit left DET=woods
'If you didn't do that then your spirit would be left up there in the back woods.'
(Watanabe 2020, 287)

Since consultants do not accept *č̓a* and *k̓ʷa* taking scope in the antecedent of conditionals, this test is inconclusive and cannot be used to argue for a modal analysis of the clitics.

Embedding under attitude verbs: We now turn to embedding under attitude verbs. In order to show that the evidentials are semantically embedded in these environments, it is necessary to show that they can occur where the speaker cannot felicitously make a modal claim, but the subject of the matrix clause can. One such environment is where the speaker has direct evidence that the embedded proposition is true. Since it would be infelicitous for the speaker to make a modal claim when in possession of direct evidence for the proposition, the utterance should only be felicitous where the modal claim is attributed to the matrix clause subject.

(21) *Context (based on Tom and Mittens, Rolka and Cable 2014): Tom told his cat that it needed a bath. The cat ran out of the room and into another where it hid in a box. I saw the cat run and hide in the box and then I watched Tom figuring it out. I say:*

a. Tom realized his cat must be hiding.

b. # His cat must be hiding.

Another such environment is where the speaker knows the embedded proposition to be false. In order to make a modal claim, the speaker should believe that the prejacent is possibly or necessarily true. If the context is such that the speaker believes the embedded proposition to be false, the utterance should only be felicitous where the modal claim is attributed to the matrix clause subject.

(22) *Context: Gloria saw Daniel buying bus tickets to Vancouver, so she thinks he's planning a trip and she tells me. I happen to know that he was buying them for a friend.*

a. Gloria told me Daniel must be going to Vancouver, but he's not.

b. # Daniel must be going to Vancouver, but he's not.

Of course, as discussed above, the results of embedding tests using attitude predicates must be treated with caution; strong epistemic modals only embed under doxastics (e.g. *say*, *think*), argumentatives (e.g. *claim*), and semifactives (e.g. *know*, *realize*) in English (Anand and Hacquard 2013), which are environments that have also been argued to embed root clauses (Hooper and Thompson 1973). While we do not know if the same pattern holds in ʔayʔaǰuθəm, independent diagnostics for embedded root clauses have not yet been developed. This means that if evidentials embed under attitude predicates of these types, we cannot rule out the possibility that they are appearing in root clauses, which may also allow embedding of illocutionary evidentials. This means that the test is most conclusive if it is not possible for an evidential to take scope in an embedded clause, since this would support an illocutionary analysis. If an evidential can take scope in an embedded clause, this may support a modal analysis, but is not conclusive evidence.

For testing embedding under attitude predicates in ʔayʔaǰuθəm, I use matrix verbs that take nominalized clausal complements. That way, if the evidentials appear within the subordinate clause complement, the morphology clearly indicates that they are in a syntactically embedded environment. To show the evidentials take scope within the embedded clause, I construct contexts where the speaker cannot felicitously make a modal claim, but the matrix clause subject can. As in English, these are environments where the speaker knows the embedded proposition to be true or false, and therefore does not need to make an inference. Both the inferential and the reportative are infelicitous if the speaker has direct evidence for the prejacent (23), for instance.

(23) a. Context: I hear rain on the roof so I think it's raining, and then I walk outside and I see rain.
#c̓ɪc̓ɬ **c̓̓ɛ**
c̓ə∼c̓ɬ=**c̓̓a**
PROG∼rain=INFER
Intended: 'It's raining.' sf
Consultant's comment: No, 'cause you see it.

b. *Context: I see Freddie in his driveway.*
#ʔamot **c̓̓ɛ** Freddie.
ʔamut=**c̓̓a** Freddie
be.home=INFER Freddie.
'Freddie must be home.'
Corrected to *oh, niʔala ʔamut* 'Oh, he's home!'

c. *Context: I heard that Roger has a girlfriend, but I also have firsthand evidence because I've seen them together.*

nɛʔ=**k̓ʷa** šɛ waƛas Roger
ni ʔ=**k̓ʷa** šə=waƛa-s Roger
be.there=RPT DET=sweetheart-3POSS Roger
Intended: I heard Roger has a girlfriend.' sf
Consultant's comment: *niʔ=k̓ʷa*... you only heard it, you didn't see it.

d. Context: Freddie had gone down to Vancouver. Gloria tells me he's back home and later I see him in his driveway. Later, I tell you:

#nɛ **k̓ʷa** ʔamot Freddie.
niʔ=**k̓ʷa** ʔamut Freddie
be.there=RPT be.home Freddie
'Freddie's at home.' sf
Consultant's comment: [With] *k̓ʷa*, it's still hearsay.

The speaker also cannot felicitously make a modal claim using the inferential clitic when the speaker knows the prejacent to be false (24).[14]

(24) a. Context: I thought it was raining because I heard raindrops, but I go outside and it's not raining.

*č̓ɪč̓ɬ **č̓ɛ** ʔi xʷa č̓ɪč̓ɬas.
č̓ə∼č̓ɬ=**č̓a** ʔi xʷa č̓ə∼č̓ɬ=as
PROG∼rain=INFER CONJ NEG PROG∼rain=3CNJ
'It must be raining, but it's not raining. sf
Corrected to: *xʷaʔak̓ʷut č̓əč̓ɬas* 'Oh, it's not raining!'

b. *Context: I see Freddie's car in his driveway, so I think he's home, but later I found out he's went in someone else's car on the trip and they're not back yet.*

*ʔamot **č̓ɛ** Freddie ʔiy xʷaʔ ʔamotəs.
ʔamut=**č̓a** Freddie ʔiy xʷaʔ ʔamutas
be.home=INFER Freddie CONJ NEG be.home=3CNJ
'Freddie must be home, but he's not home.' sf
Consultant's comment: You're saying he's home, but then you're saying he's not.

The case of the reportative is slightly more complex. Denying the prejacent is often infelicitous, as shown in (25a,b).

[14]If the inferential could take past temporal perspective, the examples in (24) would be expected to be good, since the speaker could be describing their past inference (e.g. Condoravdi 2002). Elsewhere, I argue that the inferential and reportative cannot take past temporal perspective (Huijsmans prep), so the infelicity of the examples in (24) is expected.

(25) a. *Context: There was a rumour that Freddie won the lottery, but I talked to him and found out the rumour is not true. Later we're talking about this and I say:*

#ƛ̓ʊxʷʔəm **k̓ʷa** Freddie qəχ tala. xʷa ƛ̓ʊxʷʔəməs

ƛ̓əxʷ-ʔəm=**k̓ʷa** Freddie qəχ tala. xʷaʔ ƛ̓əxʷ-ʔəm=as

win-ACT.INTR Freddie lots money NEG win-ACT.INTR=3SUBJ

'Freddie won a lot of money (I heard). He didn't win it. sf

b. *Context: It was forecasted that it would be raining all day today, but it hasn't been raining, just a bit overcast.*

#č̓ɬ **k̓ʷa**səm ʔi xʷa č̓asəmt.

č̓əɬ=**k̓ʷa**=səm ʔiy xʷa=č̓a=səm=t

rain=RPT=FUT CNJ NEG=INFER=FUT=EXCL

'It's going to rain but it's not going to.' sf

Consultant's comment: It kind of contradicts.

In (26), however, where the denial is marked as surprising by the sequence of negation plus reportative and exclusive, the result is much improved.[15]

(26) *Context: Same as (25a).*

ʔƛ̓ʊxʷʔəm **k̓ʷa** Freddie qəχ tala. xʷaʔak̓ʷʊt!

ƛ̓əxʷ-ʔəm=**k̓ʷa** Freddie qəχ tala. xʷaʔ+k̓ʷa+ʔut

win-ACT.INTR Freddie lots money NEG=RPT=EXCL

'Freddie won a lot of money (I heard), but it turns out not! sf

I take this to indicate that the expression of surprise is used to signal perspective shift; the speaker utters the prejacent from the perspective of the person who originally made the 'report' before marking a shift back to her own perspective through mirativity.[16] As discussed in section 3.1, AnderBois (2014) argues that reportative evidentials facilitate perspective shift cross-linguistically because they introduce another perspective holder – the 'reporter'. He discusses similar data from a number of languages where bare denials of the proposition with the reportative are infelicitous, but the inclusion of evaluative language in the denial, often in the form of adverbials or first person attitude reports, saves the denial's felicity. AnderBois points out that perspective shift is a risky strategy (as originally discussed in Harris and Potts

[15] How the meaning of surprise arises compositionally in these cases is not well understood at this point. Note that the use of evidentials to mark mirativity is not uncommon, however (e.g. DeLancey 2001; Rett and Murray 2013). An anonymous reviewer suggests that a pragmatic account may be in order. I hope to explore this possibility in future research.

[16] Another possibility, raised by an anonymous reviewer, is that the time at which the evidence was valid plays a role. However, since the context is constant in (25a) and (25b) it is not clear how timing of the validity of the evidence could explain the contrast. The modal perspective and orientation (Condoravdi 2002) of these evidentials certainly deserves attention, but a full discussion of these properties is outside the scope of this chapter.

2009), since the addressee may fail to follow the speaker's intended shift. Inclusion of evaluative language helps ensure that the addressee correctly interprets the intended shift.

We have seen that neither the inferential nor the reportative can be used where the speaker knows the prejacent to be true. The inferential also cannot be used when the speaker knows the prejacent to be false, and this is generally true of the reportative as well, though perspective shift can save these utterances. In order to test for semantic embedding, I therefore use contexts where the speaker knows that the embedded proposition is true or false, but the matrix clause subject does not. Since the speaker cannot use *c̓̓ɛ* when the prejacent is known to be true or false, if the evidential is felicitous in the embedded environment, it must be attributed to the matrix subject. For the reportative *k̓ʷa*, only the cases where the speaker knows the embedded proposition to be true unambiguously involve semantic embedding, because of the possibility of perspective shift, but data for both cases where the speaker believes the embedded proposition to be true and cases where the speaker believes the embedded proposition to be false are included.

We find that both *c̓̓ɛ* and *k̓ʷa* can be semantically embedded in these environments, both when the speaker knows the embedded proposition to be true, as in (27) and (28), and when the speaker believes the embedded proposition to be false, as in (29) and (30).

(27) *Context: Tom (Tɛqaw) and Mittens storyboard (Rolka and Cable 2014) – the cat just ran out of the room and into another where it hid in a box. I saw the cat run and hide in the box and then I watched Tɛqaw figuring it out. Now I'm describing Tɛqaw.*

nopʊxʷəm	Tɛqaw	hɛs **c̓̓ɛ**	kʷ k̓ʷaxʷa	kʷayɪts	šɛ mɛmaẇs.
nup-əxʷ-əm	Tiqaw	hił=s=**c̓̓a**	kʷ=k̓ʷaxʷa	kʷay-it=s	šə=mimaẇ-s
think-NCTR-PASS	tiqaw	be=3POSS=INFER	DET=box	get.hidden-STAT=3POSS	DET=cat-3POSS

'Tɛqaw realized that his cat must be hiding in a box.' sf

(28) *Context: Gloria finds out that Roger has a girlfriend and she's excited to spread the news, so she tells me. I've already met his girlfriend though. Later I tell you about it.*

tataẇθiyəm	Gloria s**k̓ʷa** kʷa	waƛ̓a?it	Roger.	
ta∼taw-θiy-əm	Gloria s=**k̓ʷa**=kʷa	waƛa-?iyt	Roger.	
PROG∼tell-CTR.1SG.OBJ-PASS	Gloria NMLZ=RPT=CL.DEM	sweetheart-PRF	Roger	
toχʷnɛxʷołč ?ot.	qəmgusʊxʷołč	?i	tawθəs.	
təχʷ-n<i>xʷ-uł=č=?ut.	qəmgus-əxʷ-uł=č	?iy	taw-θ-as	
know-NCTR<STAT>-PST=1SG.SBJ=EXCL	meet.up-NCTR-PST=1SG.SBJ	CONJ	tell-CTR.1SG.OBJ-3ERG	

'Gloria told me (she heard) Roger got a girlfriend. I already knew. I met up with them and he told me.' sf

(29) *Context: Gloria saw Daniel buying bus tickets to Whistler and thinks he must be going on a trip there. She tells this to me, and then I talk to Daniel and find out that actually he bought them for a friend. Later, I tell you:*

tataw̓iyəm	Gloria	ho(s)**č̓ɛ**səm	Daniel	ʔəkʷ Whistler.	
ta∼taw̓iyəm	Gloria	hu=s=**č̓a**=səm	Daniel	ʔə=kʷ=Whistler.	
PROG∼tell-1SG.OBJ-PASS	Gloria	go=3POSS=INFER=FUT	Daniel	OBL=DET=Whistler	
k̓ʷʊnɛtasoł	yiyqʔamʔos		kʷ pipa	kʷs θos	
k̓ʷən-í-t-as-uł	yə∼yq-ʔəm-uł=s		kʷ=pipa	kʷ=s=hu=3POSS	
see-STAT-CTR-3ERG-PST	PROG∼buy-ACT.INTR-PST=3POSS		DET=paper	DET=NMLZ=go=3POSS	
ʔəkʷ Whistler.	qʷaqʷaysxʷołč	Daniel	tataw̓θas	xʷa(s)	
ʔə=kʷ=Whistler	qʷa∼qʷay-sxʷ-uł=č	Daniel	ta∼taw̓-θ-as	xʷaʔ=s	
OBL=DET=Whistler	PROG∼talk-CTR-PST=1SG.SBJ	Daniel	PROG∼tell-1SG.OBJ-3ERG	NEG=3POSS	
hiyas θo. hɛł šɛ patnas	yəqʔəmtasoł	pipa	kʷs θos	Whistler	
hiy+as θu hił šə=patna-s	yəq-ʔəm-t-as-uł	pipa	kʷ=s=θu=s	Whistler	
be+3SUBJ go be DET=partner-3POSS	buy-IND-CTR-PST	paper	DET=NMLZ=go=3POSS	Whistler	

'Gloria told me Daniel must be going to Whistler. She saw him buy tickets for going to Whistler. I talked to Daniel. He told me it's not him that's going. He bought the tickets to Whistler for his friend.' sf

(30) *Context: Gloria hears Freddie won at bingo so she's excited and tells me about it. I was actually there, so I know that Freddie didn't win.*

tataw̓iyəm	Gloria	s**k̓ʷa** kʷa	λ̓ʊxʷʔəm	Freddie	ʔəkʷ	qəχ tala,	
ta∼taw̓-θiy-əm	Gloria	s=**k̓ʷa**=kʷa	λ̓əxʷ-ʔəm	Freddie	ʔə=kʷ	qəχ tala.	
PROG∼tell-1SG.OBJ-PASS	Gloria	NMLZ=REP=CL.DEM	win-ACT.INTR	Freddie	OBL=DET	lots money	
ʔiy xʷaʔ, hɛł	Daniel	λ̓ʊxʷʔəmoł.					
ʔiy xʷaʔ, hił	Daniel	λ̓əxʷ-ʔəm-uł.					
CONJ NEG be	Daniel	win-ACT.INTR-PST					

'Gloria told me (she heard) Freddie won a lot of money, but no! It was Daniel who won.' sf

In this section, we have seen evidence that both *č̓ɛ* and *k̓ʷa* can be embedded under attitude verbs. This shows that they can take scope under other at-issue content, supporting a modal analysis where the evidentials contribute at-issue content. This evidence is not conclusive, however, since it is possible that speech act operators could also embed in these environments.

Challengeability Our next diagnostic concerns the challengeability of the modal claim. Under a modal analysis, it should be possible to challenge the modal claim, whereas under a non-modal analysis, it should

only be possible to challenge the prejacent itself. Challenging a modal claim typically involves denying one of the premises which narrow the set of possible worlds the modal is quantifying over (Faller 2002; Matthewson et al. 2007). For instance, in (31), the second detective challenges the premise that only someone with keys could have gotten into the house to steal the necklace. In languages with modals of different strengths, this type of challenge may involve the alternate weaker modal. For instance in (31), the modal claim made with the strong modal is challenged with a weaker modal claim, which allows worlds where someone entered the house using a ladder into the modal base. Note that the same challenge is not felicitous in response to the plain assertion (32).

(31) a. *Context: There are two detectives discussing the case of a stolen necklace. Knowing the neighbour had keys to the house, one of the detectives utters:* The neighbour had keys to the house. He must have stolen the neckalce.

b. *The other detective, knowing that the gardener had a ladder that would allow him to get in the window, utters:* That's not true. It might not have been him. It might have been the gardener. He had a ladder that could reach the window.

(32) a. *Context: There are two detectives discussing the case of a stolen necklace. One of the detectives, having interviewed the suspect, is convinced that it was him and utters:* The neighbour stole the necklace.

b. *The other detective disagrees and utters:* That's not true. # It might not have been him. It might have been the gardener.

In order to elicit modal challenges, then, it is necessary to construct a context where there are two characters making inferences concerning the same proposition, but with different propositions in the modal base of each. Matthewson et al. (2007) also point out that it is important that the challenge in the target language takes a form corresponding to 'that's not true' in English to be sure that the at-issue content is being challenged, since presuppositions can also be challenged but with different responses such as 'hey, wait a minute!'.

For both *c̓ɛ* and *k̓ʷa* in ʔayʔaǰuθəm, the modal claim can be challenged. The following examples show that both the modal claim and the prejacent are possible targets for challenge with *xʷaʔ gənɔxʷəs* 'That's not true'. When challenging the modal claim, the challenger does not assert that the prejacent is false, but rather objects to the premises used to narrow down the modal base or the reasoning from the premises. The challenger can therefore still believe there is a possibility that the prejacent is true. This is illustrated in the examples below.

In (33B), B challenges A's premise that if Freddie's lights are on, he is home (this example is taken from Matthewson et al. 2007; Matthewson 2012). B uses *qʷayin*, which is a clausal adjunct marking epistemic uncertainty; it is variably translated as *probably*, *might be*, and *I think*. B's use of *qʷayin* indicates that B

has not determined the prejacent to be false, and so is not challenging the prejacent itself, but rather the reasoning used to assert it. In contrast, the prejacent is directly challenged in (33B').

(33) Context: A and B are driving past Freddie's house and see that Freddie's lights are on…

A: χʷawɪt nɪkʷayus Freddie. ʔamot **č̓ɛ**.
χʷəẇ-it nikʷayu-s Freddie ʔamut=**č̓a**
get.lit-STAT light-3POSS Freddie be.home=INFER
'Freddie's lights are on. He must be home.'

B: xʷaʔ gənʊxʷas. qʷayɪn xʷaʔ ʔamotas. payɛ ʔot χʷawɪtsxʷas
xʷaʔ gənəxʷ=as qʷayin xʷaʔ amut=as paya ʔ=ʔut χʷaẇ-ít-sxʷ-as
NEG true=3SUBJ EPST NEG be.home=3SUBJ always=EXCL get.lit-STAT-CAUS-3ERG
nɪkʷayus.
nikʷayu-s
light-3POSS
'That's not true. He's probably not home. He always leaves his lights on.

B': xʷaʔ gənʊxʷas. tawθasoł χʷoχʷsəm xʷukʷts.
xʷaʔ gənəxʷ=as taw-θ-as-uł χʷuχʷ=səm xʷukʷts
NEG true=3SUBJ tell-1SG.OBJ-3ERG-PST long.time=FUT not.exist
'That's not true. He told me he would be gone a long time.' sf

In (34), B challenges A's premise that the source of the report is reliable. Again, use of *qʷayin* in the challenge indicates that B is not certain that the prejacent is false, so that *xʷaʔ gənəxʷas* 'that's not true' cannot be targeting the prejacent directly, but rather the reliability of the prejacent. (34B'), in contrast, is a challenge to the prejacent itself.

(34) Context: A had a conversation with Daniel earlier. Now A is telling B what Daniel told her…

A: tatawθiyəm Daniel ninɪǰɛ Freddie. qʷol **k̓ʷa** hɛwt sǰɛsoł.
ta∼taw-θiy-əm Daniel ninɪǰa Freddie qʷəl̇=**k̓ʷa** hiwt sǰasuł
PROG∼tell-CTR.1SG.OBJ-PASS Daniel about Freddie come=PRT get.home yesterday
'Daniel was telling me about Freddie. He got home yesterday (he said).'

B: xʷaʔ gənʊxʷas. payɛ gaχgaχnomot Daniel. qʷayın xʷaʔ ʔamotas
xʷaʔ gənəxʷ=as payaʔ gəχ∼gaχ-nu-mut Daniel. qʷayin xʷaʔ ʔamut=as
NEG true=3SUBJ always PL∼dream-NCTR-REFL Daniel EPST NEG be.home=3SUBJ
Freddie.
Freddie.
Freddie
'That's not true. Daniel's always fantasizing/making up stories. Freddie is probably not home.'

B': xʷaʔ gənʊxʷoθəs Daniel. xʷaʔ ʔamotas Freddie.
xʷaʔ gənəxʷ-uθ=as Daniel xʷaʔ ʔamut=as Freddie.
NEG true-mouth=3SUBJ Daniel NEG be.home=3SUBJ Freddie
'It's not true what Daniel said. Freddie's not home.' sf

The next few examples all involve dialogue between two detectives on a single case. In (35), detective B challenges detective A's premise that the gardener is no longer a suspect. Detective B's use of *qʷayin* indicates that the prejacent is not directly contradicted, but rather Detective A's modal claim.

(35) Context: Two detectives are discussing the case of a missing necklace. They have two suspects remaining – the nephew of the person whose necklace was stolen and the gardener. Detective A is feeling quite sure that the nephew did it, given all the evidence, but detective B still thinks it could be the gardener.

A: hɛ **ʔ̌ɛ** t̓ᶿeyʊxʷs.
hiɬ=**ʔ̌a** t̓ᶿiyəxʷ-s
be=INFER nephew-3POSS
'It must have been the nephew. vf

B: xʷaʔ gənʊxʷas. qʷayın xʷaʔ hiyas. qʷayın hɛɬ šɛ niš p̓ap̓ɛm. ču ʔotən k̓ʷa.
xʷaʔ gənəxʷ=as qʷayin xʷaʔ hiy=as qʷayin hiɬ šə=niš p̓ap̓im ču ʔutən=k̓ʷa
NEG true=3SUBJ EPST NEG be=3SUBJ EPST be DET=be.here work thief=RPT
'That's not true. It likely wasn't him. It was probably the gardener. It's said he's a thief. sf

For this dialogue, I have a second version from another speaker, in (36). This older speaker felt that *xʷaʔ gənʊxʷəs* 'That's not true' could not be used by detective B in this context because detective B is not directly contradicting detective A's claim that the nephew is the thief. Instead she preferred a response beginning with *qʷayın xʷaʔ* 'It might not be.' Several conversations with her have made it clear that she feels that using *xʷaʔ gənʊxʷəs* is quite confrontational. In light of this, it seems that for her *xʷaʔ gənəxʷas* is only appropriate where the challenger can challenge the truth of the prejacent itself, not just the reasoning behind the assertion. The absence of *xʷaʔ gənʊxʷəs* is somewhat problematic, however, as challenges

with *xʷaʔ gənʊxʷəs* ‘that’s not true’ unambiguously target at-issue content, while challenges without *xʷaʔ gənʊxʷəs* ‘that’s not true’ may target other aspects of the utterance (e.g. Matthewson et al. 2007). Though this casts some doubt on the conclusiveness of this data, the content of B’s challenge makes it clear that B is not sure that prejacent is false and is therefore most plausibly challenging A’s inference, rather than the prejacent itself. I therefore conclude, though more tentatively, that this dialogue also illustrates a challenge to a modal claim.

(36) Context: As in (35).

A: hɛ **ʔčɛ** t̓$^{\theta}$eyʊxʷs.
hił=**ʔča** t̓$^{\theta}$iyəxʷ-s
be=INFER nephew-3POSS
‘It must have been the nephew.

B: qʷayın xʷaʔ. čım ga šɛ niš p̓ap̓ɛm? hoštəm qʷɛqʷaysxʷ
qʷayin xʷaʔ čəm̓=ga šə=niš p̓ap̓im hu=štəm qʷiqʷaysxʷ
EPST NEG why/how=DPRT DET=be.here work go=1PL.SBJ+FUT PROG∼talk-CAUS
šɛ niš p̓ap̓ɛm.
šə=niš p̓ap̓im
DET=be.here work
‘It probably wasn’t him. What about the gardener? Let’s talk to the gardener.’ vf

We turn now to a parallel example involving reported evidence. In (37B), B challenges A’s certainty in making the claim with the reportative in (37A). B is clearly not in possession of facts to challenge the prejacent directly, since B is still speculating about the possible identity of the thief. (37B’) is a challenge to the prejacent itself.

(37) Context: Two detectives are discussing the case of a missing necklace. They have two suspects remaining – the nephew of the person whose necklace was stolen and the gardener. Detective A is convinced by a witness that the nephew did it, but detective B distrusts the witness.

A: nɛtəm šɛ payɛs xʷukʷts talas. hɛ **ʔkʷa** šɛ t̓$^{\theta}$eyʊxʷs.
ni-t-əm šə=payaʔ=s xʷukʷt-s tala-s. hi=**ʔkʷa** šə=t̓$^{\theta}$iyəxʷ-s
say-CTR-PASS DET=always=3POSS not.any-? money-3POSS. be=RPT DET=nephew
‘It’s said he never has money. It’s said it was the nephew.’

B: xʷaʔ gənʊxʷəs. qʷayın xʷaʔ hiyas šɛ t̓ᶿeyʊxʷs. qʷayın hɛł šɛ niš
xʷaʔ gənəxʷ=as qʷayin xʷaʔ hił+as šə=t̓ᶿiyəxʷ-s qʷayin hił šə=niš
NEG true=3SUBJ EPST NEG be+3SUBJ DET=nephew-3POSS EPST be DET=be.here
ṗaṗɛm. hoy k̓ʷot nɛʔoł ṗaṗɛm šin t̓ᶿok̓ʷ ʔi gaq̓ɛtoł šɛ ʔɛmɛn
ṗaṗim huy=k̓ʷa+ʔut niʔ-uł ṗaṗim šiṅ t̓ᶿuk̓ʷ ʔiy gəq̓-it-uł šə=ʔimin
work finish=RPT+EXCL be.there-PST work DEM day CONJ open-STAT-PST DET=door
'That's not true. It probably wasn't his nephew. It was probably the gardener. He was the only one working there that day and the door was open.'

B': xʷaʔ gənʊxʷoθəs.
xʷaʔ gənəxʷuθ=as
NEG true-mouth=3SUBJ
'What he said is not true.' sf

For this dialogue, I also have a second version from the older speaker. Again, *xʷaʔ gənʊxʷəs* 'That's not true' is absent in B's challenge for this speaker. Nevertheless, B is clearly challenging the premise that the witness is reliable, rather than the prejacent itself.

(38) Context: As in (37). Note that the witness = Daniel.

A: qʷɛqʷaysxʷołč Daniel. hɛ **k̓ʷa** šɛ t̓ᶿeyʊxʷs kʷ maʔt.
qʷɛ∼qʷay-sxʷ-uł=č Daniel hi=**k̓ʷa** šə=t̓ᶿiyəxʷ-s kʷ=maʔ-t
PROG∼talk-CAUS-PST=1SG.SBJ Daniel be=RPT DET=nephew COMP=take-CTR
'I spoke to Daniel. It was the nephew that took it (he said).'

B: qʷayın xʷaʔ. qʷayın naynayəw Daniel. hoštəm qʷɛqʷaysxʷ šɛ niš
qʷayin xʷaʔ qʷayin nay∼nayəw Daniel hu=štəm qʷi∼qʷay-sxʷ šə=niš
EPST NEG EPST CHAR?∼forget-? Daniel go=1PL.SBJ+FUT PROG∼talk-CAUS DET=be.here
ṗaṗɛm.
ṗaṗim
work
'It might not be. Daniel might be mistaken. Let's go talk to the gardener.' sf

Throughout these dialogues we have seen that there is a contrast between challenging the prejacent and challenging the modal claim. Challenging the prejacent involves denying the truth of the previous utterance. In contrast, challenging the modal claim involves denying the validity of the inference, but allows uncertainty about whether the prejacent is in fact false. Since both types of challenges are possible in response to a claim with *c̓ɛ* and *k̓ʷa*, these dialogues supports an analysis where *c̓ɛ* and *k̓ʷa* are modals, contributing at-issue content that can be challenged.

Continuations: We now turn to the final test for diagnosing the at-issue content, examining what can felicitously follow an utterance with the evidential. Modal and illocutionary evidentials will have different effects on possible continuations since a modal claim changes the at-issue content of the utterance, whereas an illocutionary evidential does not. In what follows, I first lay out the predictions for a modal evidential, and then examine the contrasting predictions for an illocutionary evidential.

A modal claim does not assert the prejacent to be true of the actual world, unlike a plain assertion. Therefore, a continuation that relies on accepting *p* as true of the actual world should be felicitous following a plain assertion of *p*, but not a modal claim of *p*. For instance, if I have accepted the proposition that Freddie travelled to another city, and then I accept the proposition that Freddie is home now, then these two propositions together entail that Freddie has returned home. This makes a continuation that asserts Freddie's return possible without further inference, even though I didn't directly witness his return, as in (39).[17]

(39) *Context: Freddie was on a trip to New Westminster. He's back home now, and I visited him this morning. Now I tell you:*
Freddie is home. He came back from New Westminster.

There is a contrast if I am only inferring that Freddie is now home. In this case, it is not entailed that Freddie has returned from his trip. I therefore cannot assert that this is the case; I can only infer it, as illustrated in (40).

(40) *Context: Freddie was on a trip to New Westminster. This morning, I saw his car in his driveway. Now I tell you:*
Freddie must be home. # He came back from New Westminster. (Ok: He must have come back from New Westminster.)

We expect this behaviour for modal evidentials. If a modal evidential combines with the prejacent *p*, *p* is claimed only of possible worlds, and a continuation *q* which is entailed by the plain prejacent in the context, is entailed only in the possible worlds where *p* is true. The continuation *q* must thefore also appear with a modal element. In contrast, a plain assertion of the prejacent *p* claims *p* to be true in the actual world and entails *q* in the actual world; therefore, *q* is predicted to not require a modal even if not directly witnessed.

Nonmodal evidentials are not expected to show a parallel contrast. If the indirect evidential is a speech act operator that is required whenever the prejacent is not known through direct evidence, the continuation *He came back from New Westminster* should require the evidential in both the context of (39) and (40). If the indirect evidential is a speech act operator that marks inference, we also do not expect a contrast. Since the evidential would not involve a modal claim, the prejacent *p Freddie is home* will be claimed to be true

[17]It is also possible to use *must* in the continuation: *He must have come back from New Westminster*. This is expected under von Fintel and Gillies's (2010) analysis of epistemic modals which I will adopt in Section 5. Basically, their approach predicts that *must* will be felicitous wherever the speaker does not have a single 'piece' of direct information that settles whether the prejacent is true. Since the continuation in (39) is not entailed by the prejacent alone, but by the prejacent in conjunction with the knowledge that Freddie had been away, the felicity conditions are satisfied.

in the actual world in both the equivalent of (39) and the equivalent of (40). Therefore, the continuation *q* should be entailed in both and not require the presence of the evidential.

The hypothetical cases outlined above assume an evidential speech act operator that involves an assertion of the prejacent. This test cannot distinguish between a modal evidential and an evidential speech act operator that only involves presenting the prejacent. If the prejacent *p* appears with such an evidential it will not be claimed of the real world *w*, but only presented to the addressee. The continuation *q* is therefore also not entailed in the real world and therefore would likely also have to appear with the evidential, if it can be felicitously uttered at all. It is therefore necessary to conduct the continuation test in conjunction with tests that show whether the prejacent needs to be believed true in the actual world when the evidential is used.

With this background in place, we can go about implementing this test in ʔayʔaǰuθəm. In order to keep the contexts clear, I used short storyboards. The storyboard in Figure 1 was used as a baseline. The first panel sets up the background knowledge that Freddie is in New Westminster (*kʷins pala*), the next shows Freddie at home in his driveway, and the speaker interacting with him. The final panel shows the speaker saying that Freddie is home, having returned from New Westminster. The storyboard was explained to the consultant and then the consultant was asked to judge whether a suggested utterance for speaker in the storyboard was a good fit to the context. I then presented the two options: one where the claim that Freddie returned from New Westminster had the inferential evidential and one where the claim did not.

Figure 1: Testing continuations, baseline context

Figure 2 sets up the context where the prejacent *p* is known through inference. The first panel is as in the previous context. The second panel differs. The speaker does not see Freddie at home, but just that his car is in front of his house. In the final panel, the speaker is saying that the Freddie is home, having returned from New Westminster – but in this case is basing the claim on Freddie's car being in the driveway. The storyboard was presented to the consultant in the same manner as the previous.

The results for this test indicate that an assertion with *c̓ɛ* is an assertion about possible worlds, not an

Figure 2: Testing continuations, inferential context

assertion about the real world. In both (41) and (42), for instance, the speaker does not directly witness Freddie's trip home. However, if the speaker asserts Freddie to be home, it is entailed that he has come home from his trip and the inferential need not be used to assert this second proposition (41). If, on the other hand, the speaker uses *čɛ̓* in the claim that Freddie is home, it does not follow that Freddie has come home from his trip in the real world and the following proposition must be marked with the inferential (42).

(41) *Context: Freddie has been away in New Westminster. This morning I saw him in his driveway. Then I say:*

ʔamot	Freddie.	kʷa	qʷolə̓	χəpi	tawa	kʷins	pala.
ʔamut	Freddie	kʷa	qʷəl̓	χəpəy	tawa	kʷins	pala
be.home	Freddie	CL.DEM	come	return	from	kʷins	pala

'Freddie is home. He has returned from New Westminster. sf

(42) *Context: Freddie has been away in New Westminster. This morning I saw his car in the driveway. Then I say:*

ʔamot **čɛ̓**	Freddie.	#(**čɛ̓**) kʷa	qʷolə̓	χəpi	tawa	kʷins	pala.
ʔamut=**ča̓**	Freddie	**ča̓**=kʷa	qʷəl̓	χəpəy	tawa	kʷins	pala
be.home=INFER	Freddie	INFER=CL.DEM	come	return	from	kʷins	pala

'Freddie must be home. He #(must have) returned from New Westminster. sf

This test can also be used for the reportative. The baseline case is the same as before. The test case involves the speaker hearing from someone that Freddie is home and then passing this knowledge on to someone else. For this case, I used the storyboard in Figure 3. The first panel is as in the previous storyboards. In the second, the speaker hears from someone that Freddie is home. In the third panel, the speaker again says that Freddie is home, having come back from New Westminster, but is now basing

this claim on reported evidence. As before, the consultant was asked to judge whether the speaker in the storyboard's utterance matched the context where the continuation had or did not contain a modal evidential.

Figure 3: Testing continuations, reportative context

The results for the reportative are parallel to those for the inferential. If the speaker claims Freddie to be home based on reported evidence, the second proposition must be marked with an inferential (43). The speaker only knows Freddie to be home in all worlds compatible with the report, but does not know him to be home in the real world, so his return also cannot be asserted of the real world. The inferential, rather than the reportative, is used in the felicitous continuation because Gloria's report did not include the information that Freddie had returned from New Westminster. If she had also provided this information, the reportative could have been used instead.

(43) *Context: Freddie has been away in New Westminster. This morning Gloria told me that he is home. Then I say:*

ʔamot **k̓ʷa**	Freddie.	#(**č̓ɛ**) kʷa	qʷol̓	χəpi	tawa	kʷins	pala.
ʔamut=**k̓ʷa**	Freddie	**č̓a**=kʷa	qʷəl̓	χəpəy	tawa	kʷins	pala
be.home=RPT	Freddie	INFER=CL.DEM	come	return	from	kʷins	pala

'Freddie must be home. He #(must have) returned from New Westminster. sf

I also checked this with a second set of storyboards. In this case, the speaker has a cat that keeps climbing up to the roof. For the first storyboard, the speaker has direct evidence that the cat is on the roof and knows the cat climbed up the ladder to get there (44).

(44) *Context: M has a cat that likes to climb up to the roof, using a ladder that goes up to the roof. The ladder is the only way to the roof. M goes up the ladder and sees her cat on the roof. She says:*

nɛ kʷ ʔiyɪtxʷ tᶿ mɛmaẇ. (**č̓ɛ**) θo šɛʔ qey tə hayšɪn.
niʔ kʷ=ʔiyitxʷ tᶿ=mimaẇ. **č̓a** θu šəʔ qəǰi tə=hayšin
be.there DET=roof 1SG.POSS=cat INFER go up again DET=ladder
'My cat is on the roof. It went (must have gone) up the ladder again.' sf

For the second storyboard, the speaker does not see the cat on the roof, but only hears it meowing. In this case, where the initial proposition is inferred, the inferential is also required in the second sentence in (45).

(45) *Context: M has a cat that likes to climb up to the roof, using a ladder that goes up to the roof. The ladder is the only way to the roof. M hears her cat meowing from the roof. She says:*

nɛ **č̓ɛ** kʷ ʔiyɪtxʷ tᶿ mɛmaẇ. #(**č̓ɛ**) θo šɛ qey tə hayšɪn.
niʔ=**č̓a** kʷ=ʔiyitxʷ tᶿ=mimaẇ. **č̓a** θu šəʔ qəǰi tə=hayšin
be.there=INFER DET=roof 1SG.POSS=cat INFER go up again DET=ladder
'My cat must be on the roof. It must have gone up the ladder again.' sf

For the final version of the storyboard, the speaker finds out that her cat is on the roof from a friend. In this case, where the initial proposition is based on reported evidence, the inferential is required in the second sentence of (46).

(46) *Context: M has a cat that likes to climb up to the roof, using a ladder that goes up to the roof. The ladder is the only way to the roof. M's friend tells her that her cat is on the roof. She says:*

nɛ **k̓ʷa** kʷ ʔiyɪtxʷ tᶿ mɛmaẇ. #(**č̓ɛ**) θo šɛʔ qey tə hayšɪn.
niʔ=**k̓ʷa** kʷ=ʔiyitxʷ tᶿ=mimaẇ. **č̓a** θu šəʔ qəǰi tə=hayšin
be.there=RPT DET=roof 1SG.POSS=cat INFER go up again DET=ladder
'My cat is (reportedly) on the roof. It must have gone up the ladder again.'

If *č̓ɛ* and *k̓ʷa* did not contribute a modal claim, but left the at-issue content unaltered, the second target proposition should be entailed in all of the above examples and there should be no contrast in where the evidentials are required to appear. If *č̓ɛ* and *k̓ʷa* are modals altering the truth conditions so that the prejacent is only asserted to be true in possible worlds, the contrasts in where the evidentials are required in the above the examples are expected. I therefore conclude that these results support a modal analysis of these clitics.

3.3 Conclusion

In this section, we examined whether the inferential *č̓ɛ* and reportative *k̓ʷa* in ʔayʔaǰuθəm are best characterized as modal or illocutionary evidentials. We saw that these evidentials can embed under attitude

predicates and have an at-issue contribution that can be challenged. We also saw evidence that the presence of *čʼɛ* or *kʷʼa* affects possible continuations in a way consistent with a modal analysis. While the evidence from each of these tests is subtle, taken together, the results of these tests indicate that these evidentials are best characterized as modal.

4 Evidentials in questions

In this section, I discuss *čʼɛ* and *kʷʼa* in questions and address a possible counterargument to the claim that the reportative is an epistemic modal. The potential counterargument concerns cases where the reportative appears to embed questions; this behaviour is one of the reasons Faller (2002) argues the reportative in Cuzco Quechua is an illocutionary evidential. Before examining these cases, however, we set a baseline by examining more canonical uses of these evidentials in questions.

Both the inferential and the reportative can occur in questions, scoping under the question particle. In these cases, the speaker asks the addressee to answer based on inferential or reported evidence (47–49). These cases are compatible with a modal analysis – the presupposition projects, as the speaker expects the addressee to have indirect or reportative evidence, while the alternative answers are each modal claims (assuming a Hamblin 1973 semantics for questions).[18]

(47) *Context: Using the Tom and Mittens storyboard (Rolka and Cable 2014), the speaker is telling the story to a child. In the story, Tom's cat is hiding because he doesn't want a bath. The speaker knows the story and therefore knows where the cat is hiding. In order to keep the child engaged, however, the speaker addresses this question to the child.*

hɛ **čʼɛ**	kʷ čɛ	ʔəxʷ nɛʔs	kʷayɪt?	ṫamat ga!
hiɬ=**čʼa**	kʷ=ča	ʔə=xʷ=niʔ=s	kʷayit	ṫam-at=ga
be=INFER	DET=where	OBL=PRT=be.there=3POSS	hideSTAT	guess-CTR=PRT

'Where do you think the cat is hiding? Guess!' vf

Speaker has direct evidence.

Addressee has inferential evidence.

[18] The inferential also appears in conjectural questions; these are cases where the use of the inferential enclitic in a question gives rise to a non-interrogative reading roughly translatable as 'I wonder...', as in (1a). For a modal analysis of conjectural questions, see Littell et al. (2010).

(48) *Context: Freddie says his dog didn't eat this morning. I ask him:*

kʷukʷtəma **č̓a**?

kʷəkʷt-əm=a=**č̓a**

sick-MD=Q=INFER

'Is he sick?' sf

Speaker does not have indirect evidence (beyond addressee report).

Addressee has indirect evidence.

(49) *Context: Gloria just got off the phone with Freddie's daughter. I think she might have heard whether Freddie is at home.*

kʷʊna **k̓ʷa** qʷol hɛwt.

kʷən=a=**k̓ʷa** qʷəl̓ hiwt

COMP=Q=RPT come get.home

'Is he home?' vf

Speaker does not have reported evidence

Addressee has reported evidence.

However, the reportative can also receive another interpretation in questions, where the speaker uses the reportative when conveying the question of a third party. In these cases, the reportative embeds the speech act, rather than a proposition (50). Of the two speakers I have been able to check these with, one accepts these cases and the other rejects them.

(50) *Context: Laura, who is soft-spoken, asks Freddie if he wants tea. He doesn't hear, so I pass on the question.*

ʔəθ χaƛ̓a **k̓ʷa** kʷ tihaya?

ʔəθ=χaƛ̓=a=**k̓ʷa** kʷ=tihaya?

2SG.POSS=want=Q=RPT DET=tea

'Do you want tea (she said)?' vf

The ability to embed speech acts is sometimes taken to be the most convincing evidence for an illocutionary analysis of evidentials (Faller 2002). It is not clear whether a modal could take scope over a speech act, while under Faller's analysis, illocutionary evidentials always compose with speech acts. Her proposal for these cases is that the reportative combines with the speech act that has the illocutionary force of a question and changes the illocutionary force to presentation – the speaker presents someone else's question, but is not actually asking the question. While this accounts for the 'quotative' cases such as (50) quite elegantly, her proposal then faces challenges for the more canonical cases of evidentials in questions, where the evidentials scope *under* the question operator, so that the addressee is expected to answer based

on indirect evidence. In order for her proposal to work for these more canonical cases, she must abandon a straightforward Hamblin-style analysis of a question as a set of its possible answers and propose that questions involve two illocutionary operators: a REQUEST that the addressee ASSERT a proposition from the set of alternative answers. She proposes that the evidential can scope either over or under the REQUEST operator, giving rise to the two readings.

While Faller's proposal is a possible analysis of questions, it is not the standard approach. As Faller herself points out, it also predicts that the inferential evidential should similarly be able to scope over the REQUEST operator, as well as under, but this does not seem to be possible. Another problematic prediction, at least for ʔayʔaǰuθəm, is that the reportative should be able to take scope over other types of speech acts, allowing the speaker to pass on someone else's request, for instance. This does not seem to be possible, even for the speaker who accepts the reportative scoping over questions (as in (50)).[19]

(52) a. *Context: Gloria asks Freddie to pass the sugar. He doesn't hear so I pass on her request.*

*χanaθ **k̓ʷa**	ʔə tə šukʷa.
χan-aθ=**k̓ʷa**	ʔə=tə=šukʷa.
give-CTR+1SG.OBJ=RPT	OBL=DET=sugar
'Pass the sugar (she said).'	sf

In any case, since the 'quotative' uses are less common than cases where the reportative scopes under the question operator (and actually impossible for some speakers) in ʔayʔaǰuθəm, building an analysis that works well for these uses, but complicates the more canonical cases seems misguided. Of course, adopting an illocutionary analysis would be problematic regardless, given that we have seen evidence that both the inferential and reportative contribute at-issue content.

ʔayʔaǰuθəm is not unique in having a reportative evidential that patterns as a modal, but has 'quotative' uses. Tan Almazán (2019) argues that the reportative *daw* in Tagalog is an epistemic modal, but also discusses uses of the reportative parallel to (52). Tan Almazán concludes that scope in questions cannot distinguish an illocutionary from a modal analysis of evidentials. Developing an analysis of the 'quotative'

[19]The inferential also cannot appear in imperatives, even if the speaker's motivation for the request is inference (51). This is expected under a modal analysis, since modals combine with propositions, not speech acts, and a modal claim is a claim concerning a proposition, not a speech act; the compatibility of modals with questions is not a counterexample because questions are modeled as sets of propositions, so a question with a modal will be a set of propositions containing the modal.

(51) *Context: I see you are looking quite pale. I tell you to go to bed and rest.*

ho (*ʧ̓ɛ) ga	ʔaχɛθ.
hu=ʧ̓a=ga	ʔaχiθ.
go=INFER=DPRT	lie.down
'Go lie down.'	sf

Faller's speech act analysis may also predict this behavior for the inferential. Although Faller (2002) proposes that the inferential (referred to as the 'conjectural') in Cuzco Quechua is a speech act operator, she also gives it a modal component, which could be taken to rule out uses in imperatives.

cases is beyond the scope of this chapter, however, and the reader is referred to Tan Almazán (2019) for further discussion (though she also does not provide a complete analysis of these particular cases).

5 Formal analysis

We have now seen evidence that *c̓ɛ* and *k̓ʷa* contribute to the at-issue content of the clause and are therefore best analyzed as epistemic modals. In this section I propose a formal analysis to capture the behavior of each of these modals. Since neither is compatible with contexts where the speaker knows the proposition to be true or false based on direct evidence (leaving aside the question of perspective shift induced by the reportative momentarily), I adopt von Fintel and Gillies' (2010) approach to epistemic modals. They propose that epistemic modals are evidentials that presuppose that the speaker's direct information in the context does not settle whether *p* is true or false; the speaker's direct information is the information the speaker treats as 'direct trustworthy evidence', often, but not exclusively, known through direct observation (von Fintel and Gillies 2010, 369). They formalize the direct information available to the speaker as a set of propositions, which they call a kernel (*K*). The modal base (*B*) of an epistemic modal is the intersection of these propositions.

(53) K is a kernel for B_K, B_K is determined by the kernel K, only if:

i. K is a set of propositions (if $P \in K$ then $P \subseteq W$)

ii. $B_K = \cap K$ (von Fintel and Gillies 2010, 371)

Using these tools, von Fintel and Gillies formalize the condition that the speaker does not have direct information that settles whether the prejacent is true or false. For them, the kernel directly settles whether *p* if there is direct information in *K* that entails or contradicts the prejacent.

(54) K directly settles whether P iff either $X \subseteq P$ or $X \cap P = \oslash$ for some $X \in K$.

(von Fintel and Gillies 2010, 374)

Epistemic modals presuppose that the kernel does not settle whether *p*. An epistemic necessity modal such as *must* or *c̓ɛ* then asserts that the modal base (i.e. the intersection of all the propositions in the kernel, which represents the direct information the speaker has in the context) entails that *p* is true. That is, *p* is true in all the worlds compatible with all the direct information available to the speaker. I introduce the kernel as a parameter of evaluation.[20]

[20]This is similar to Yalcin's (2007) approach to epistemic modals which involves an information state parameter for evaluation (see also Veltman 1996); in Yalcin's analysis, however, an information state is a set of worlds compatible with the speaker's (or attitude holder's) information, while I adopt von Fintel and Gillies's notion of a kernel, which is a type of information state consisting of a set of propositions. Yalcin also allows attitude predicates such as *imagine* to update the information state for the evaluation of an embedded proposition to a set of worlds compatible with the attitude holder's imaginings, rather than infor-

(55) i. $[\![\dot{c}\dot{\varepsilon} \ \phi]\!]^{c,w,g,K}$ is defined only if K does not directly settle $[\![\phi]\!]^{c,g}$

ii. If defined, $[\![\dot{c}\dot{\varepsilon} \ \phi]\!]^{c,w,g,K} = 1$ iff $B_K \subseteq [\![\phi]\!]^{c,g}$ (adapted from von Fintel and Gillies 2010, 372)

This analysis allows us to capture the behavior of the ʔayʔaǰuθəm inferential *c̓ɛ̓*. It straightforwardly predicts its epistemic flavour, strong modal force, and requirement that the speaker does not have direct evidence for the prejacent. Because the modal contribution is at-issue, this analysis also captures its challengeability and effect on possible continuations.[21]

In the case of embedding under attitude predicates, the kernel must reflect the direct information available to the matrix subject, rather than the speaker; the kernel is not strictly speaker-oriented but tracks the information available to the individual by whom the modal claim is made. Formally, this can be represented by having the matrix attitude predicate provide the kernel for the embedded proposition. I sketch such an approach below.

I base my approach on Anand and Hacquard's 2013 analysis of attitude predicates. They claim that certain attitude predicates – those they call representational[22] – provide the information state for embedded epistemic modals, adopting Yalcin's (2007) proposal that epistemic modal claims are evaluated relative to an information state parameter. Adapting Anand and Hacquard's (2013) analysis of attitude predicates to incorporate kernels, we can give *nopʊx*^{w} 'realize' from (57) (repeated from (27)) the denotation in (58). The denotation given in (58) is a simplified representation that captures only the epistemic and factive character of this predicate, not the details of meaning that would differentiate *nopʊx*^{w} 'realize' from a predicate like *toχ*^{w}*nɛx*^{w} 'know' for instance. This denotation asserts the embedded proposition ϕ to be entailed by the

mation known about the real world. Anand and Hacquard (2013), however, argue that only representational attitude predicates provide information states and therefore information states are always determined by the attitude holder's knowledge or beliefs (see footnote 22); this allows them to capture the distribution of epistemic modals, which they argue to only occur under embedding predicates that provide an information state. I will assume Anand and Hacquard (2013) are correct here.

[21] Actually, the continuation facts are not completely straightforward to handle under von Fintel and Gillies's particular modal analysis. In their model, the modal base, the intersection of the speaker's direct information, entails the prejacent of the actual world; they adopt this position since it is their central claim that a proposition with *must* is not weaker than a plain assertion. In order to capture the continuation facts with *c̓ɛ̓*, however, we need the prejacent not to be entailed in the actual world. I therefore assume that *c̓ɛ̓* comes with an ordering source, as in more traditional analyses (e.g. Kratzer 1991), though I abstract away from this in the representation above for simplicity. The ordering source ranks the worlds in the modal base according to how stereotypical they are. *c̓ɛ̓* asserts the prejacent to be entailed only in the highest ranked of these worlds. The at-issue portion of the denotation for *c̓ɛ̓* would then be as in (56), with f as the ordering source – which assigns to each world a set of propositions representing norms and ranks the world according to how many of these propositions are true in it – and $BEST$ identifying the best possible worlds as ranked by the ordering source (adopting the representation of the ordering source from Matthewson 2016):

(56) $[\![\dot{c}\dot{\varepsilon} \ \phi]\!]^{c,w,g,K} = \lambda f_{\langle s,\langle st,t\rangle\rangle} . \ BEST_{f(w)}(B_K) \subseteq [\![\phi]\!]^{c,g}$
Where for a given order on worlds $\leq_A$, $\forall X \in W[BEST_A(X) = \{x \in X : \neg\exists w' \in X[w' \leq_A w]\}]$

With an ordering source added, a proposition with *c̓ɛ̓* is not guaranteed to entail the prejacent in the real world, since the world does not always unfold in a sterotypical manner. This in turn means that entailments of the prejacent are not guaranteed to be true in the real world. This gives rise to the continuation patterns discussed in Section 3.2. The denotation I introduce for *k̓*^{w}*a* in (66) likewise abstracts away from the ordering source, but I also assume there to be an ordering source for *k̓*^{w}*a* in order to handle the continuation facts.

[22] For Anand and Hacquard (2013), following Bolinger (1968), representational attitudes describe the content of a propositionally consistent attitudinal state.

intersection of the matrix subject's kernel $K^{\prime x}_w$;[23] the embedded proposition is true in all worlds compatible with all the matrix subject's direct information. The embedding predicate also updates the kernel parameter for the embedded proposition to be the kernel of the matrix subject. This means that any epistemic modal within the embedded proposition will be evaluated relative to the matrix subject's kernel.

(57) *Context: Tom (Tɛqaw) and Mittens storyboard (Rolka and Cable 2014) – the cat just ran out of the room and into another where it hid in a box. I saw the cat run and hide in the box and then I watched Tɛqaw figuring it out. Now I'm describing Tɛqaw.*

nopʊxʷəm	Tɛqaw	hɛs **č̓ɛ**	kʷ k̓ʷaxʷa	kʷayíts	šɛ mɛmaẇs.
nup-əxʷ-əm	Tiqaw	hił=s=**č̓a**	kʷ=k̓ʷaxʷa	kʷay-ít=s	šə=mimaẇ-s
think-NCTR-PASS	Tiqaw	be=3POSS=INFER	DET=box	get.hidden-STAT=3POSS	DET=cat-3POSS

'Tɛqaw realized that his cat must be hiding in a box.' sf

(58) $[\![\ nopʊx^w\ \phi\ ]\!]^{c,w,g,K} = \lambda \mathrm{x}\ .\ \cap K^{\prime x}_w \subseteq [\![\ \phi\ ]\!]^{c,g,K^{\prime x}_w}$

We can then give (57) the truth conditions in (59). The attitude predicate provides the kernel for the embedded epistemic, including the presuppositional content. The at-issue content of the modal essentially replicates the contribution of the matrix predicate, but the presupposition ensures that the matrix subject does not have direct information settling whether the prejacent is true.

(59) $[\![\ nopʊx^w$ *Tɛqaw hɛs* **č̓ɛ** *kʷ k̓ʷaxʷa kʷayıts šɛ mɛmaẇs* $]\!]^{c,w,g,K^s_w}$ is defined only if:

i. $K^{\prime t}_w$ does not directly settle whether $[\lambda w'$. *his$_t$ cat is hiding in a box in w'*$]$

ii. If defined $[\![\ nopʊx^w$ *Tɛqaw hɛs* **č̓ɛ** *kʷ k̓ʷaxʷa kʷayıts šɛ mɛmaẇs* $]\!]^{c,w,g,K} = 1$ iff $\cap K^{\prime t}_w \subseteq [\ B_{K^{\prime t}_w} \subseteq [\lambda w'$. *his$_t$ cat is hiding in a box in w'*$]\ ]$

The kernel K for the main clause will be speaker-oriented by default. This is represented in (59) by the *s* index on K accompanying the matrix interpetation brackets. Since the matrix clause does not constitute a modal claim, however, the speaker's kernel is not involved in calculating the truth conditions.

We turn now to questions. In questions the kernel can be addressee–oriented. Adopting a Hamblin (1973) semantics for questions, where a question denotes its set of possible answers, the question with the epistemic modal will denote a set of modalized propositions (answers). The kernel for the modal claim of each proposition in the set of possible answers reflects the knowledge of the addressee. This captures the readings where the speaker asks a question she expects the addressee to answer based on an inference, as in (47–49). For instance, the semantics for the polar question with the inferential in (48), repeated here as (60), would be as in (61), where the modal base for each proposition in the set of possible answers is determined by the addressee's kernel.

[23] The intersection of the kernel is equivalent to the modal base defined in (53), but I do not refer to it with B_K to avoid terminological confusion.

(60) *Context: Freddie says his dog didn't eat this morning. I ask him:*

kʷukʷtəma **ʔčə**?

kʷəkʷt-əm=a=**ʔčə**

sick-MD=Q=INFER

'Is he sick?' sf

Speaker does not have indirect evidence (beyond addressee report).

Addressee has indirect evidence.

(61) $\{ [B_{K^a_w} \subseteq is.sick(he_1)] , [B_{K^a_w} \subseteq \neg[is.sick(he_1)] \}$

Where each proposition in the set of answers is defined iff B_{K_a} does not settle whether the prejacent is true.

In order to capture the shift in the orientation of the kernel formally, we need a shift operator for questions. I adapt (62) from McCready (2007) who proposes a similar operator to shift the judge parameter from the speaker to addressee in questions involving predicates of personal taste. In (62), I represent the kernel as indexed to the speaker by default, and then shifted by the operator to be indexed to the addressee.

(62) $Sh([\![\phi]\!]^{c,w,g,K^s_w}) = [\![\phi]\!]^{c,w,g,K^a_w}$

where *s* is the speaker and *a* is the addressee in the utterance context.

McCready proposes that this shift operator accompanies the question operator, but is independent of it. The shift operator applies prior to the question operator. Applying the shift operator in the analysis of (60), we get (63) (using *pro* to represent the null third person subject). The result is that the addressee is presupposed not to have direct information settling whether the dog is sick, and in answering, the addressee is expected to make an epistemic modal claim.

(63) $Q(Sh([\![$ *kʷukʷtəm pro* $]\!]^{c,w,g,K^s_w})) = Q([\![$ *kʷukʷtəm pro* $]\!]^{c,w,g,K^a_w}) = \{ [B_{K^a_w} \subseteq is.sick(he_1)] , [B_{K^a_w} \subseteq \neg[is.sick(he_1)] \}$

Where each proposition in the set of answers is defined iff $B_{K^a_w}$ does not settle whether the prejacent is true.

Before leaving the discussion of *ʔčɛ*, I would like to offer further motivation for treating the felicity condition as a presupposition. We have a developed an analysis where the felicity condition associated with *ʔčɛ* projects in both embedding environments and questions, though the anchoring of the modal base changes. We have not seen negative data showing that the felicity condition must be met in these environments. (64) shows that the felicity condition does in fact project in questions and causes infelicity if not met. In (64), the addressee should have direct evidence that settles whether the possible answers are true or false, since it is a question about the addressee's personal state; the use of the inferential is therefore infelicitous.

(64) #q̓aq̓ahačxʷ **čɛ̓**?

q̓aq̓a=a=čxʷ=**čɛ̓a**

hungry=Q=INFER

'Are you hungry?' sf

The conjectural question reading (see footnote 18) cannot rescue (64) since it would be pragmatically odd for the speaker to be speculating about the addressee's hunger, when the addressee, the authoritative source of information on the matter, is present.

Up to this point, the discussion has centered on the inferential. We turn now to the modifications required to capture the contribution of the reportative in this framework. Matthewson (2010) builds on von Fintel and Gillies's 2010 proposal to analyze the reportative *ku7* in St'át'imcets. She proposes that *ku7* has a two-fold presupposition: 1) that the speaker does not have direct sensory evidence for the prejacent ϕ, and 2) the speaker's kernel contains a report of ϕ.[24]

(66) $[\![k̓^w a\ \phi]\!]^{c,w,g,K}$ is defined only if:

i. K contains a proposition of the form 'someone said ϕ'.

ii. K_{SENS} does not directly settle ϕ.

iii. If defined, $[\![k̓^w a\ \phi]\!]^{c,w,g,K} = 1$ iff $B_K \subseteq [\![\phi]\!]^{c,g}$ (adapted from Matthewson 2010)[25]

Notice that Matthewson's approach imposes structure on *K* so that direct sensory evidence K_{SENS} can be referenced separately from direct information in general K. This is because the S'tát'imcets reportative can be used even where the proposition is general knowledge if the speaker does not have direct sensory evidence for *p*; this is different than for epistemic modals like *must* which cannot be used for general knowledge even if not experienced directly (e.g. # *Antarctica must be cold.*). Since general knowledge

[24] An anonymous reviewer points out that this requirement is very strong, since it places a restriction on the form of the reported evidence. While it may be possible to somewhat weaken the requirement, it is not sufficient for the reported evidence to give rise to an inference that the prejacent is true, as shown in (65).

(65) *Context: Gloria tells me in the morning that Daniel is on his way to Tla'amin. Later, in the afternoon, I tell you Daniel is coming: qʷoqʷol k̓ʷa Daniel nɛʔɛtəm Gloria. 'Gloria said Daniel is coming.' You ask me when Daniel will be here. Gloria didn't tell me when he would arrive, but I guess based on when she told me he left:*

#hɛ k̓ʷa səm	tiṅ	nanat	qʷols	təs.
hił=k̓ʷa=səm	tiṅ	nanat	qʷəl̓=s	təs
COP=RPT=FUT	DEM	evening	come=3POSS	arrive

'He'll arrive tonight.' sf

It may be that the report can differ in content from the prejacent so long as it entails the prejacent. This requires further investigation.

[25] Matthewson (2015) suggests another possible analysis for reportative evidentials within von Fintel and Gillies' framework; she proposes that the reportative presupposes only that the kernel contains a proposition of the form 'someone said ϕ', as in (66i), while the indirect evidence requirement (66ii) arises via implicature. I adopt her earlier version since it is more parallel with the denotation for the inferential and the two evidentials behave similarly with respect to their indirect evidence requirement. Further research is needed to see whether indirect evidence requirement for the reportative could be reduced to implicature.

would typically count as direct information for epistemic modals, Matthewson partitions the kernel so that the presupposition that the kernel does not settle whether *p* only involves direct sensory evidence for the reportative.

The same facts are true of ʔayʔaǰuθəm. *k̓ʷa* is compatible with knowledge that has not been directly experienced, but is general knowledge learnt from a teacher or textbook – one of my consultants even judges it to be obligatory in this context.

(67) a. *Context: I've learnt that it's cold in the Antarctic but I've never been there. Now I'm passing on this knowledge to a child.*

č̓ʊmč̓ʊm̓mot **k̓ʷa** gʊǰɛ.
č̓əm∼č̓əm̓-mut=**k̓ʷa** gəǰa
CHAR∼cold-INT=RPT land
'It is a cold land.' vf

b. *Context: I learnt about the Titanic, but I wasn't alive yet when it sank.*

θayɛʔmoł **k̓ʷa** kʷ tihmot tinpot sχʷoχʷoł.
θay-əm-ʔuɬ=**k̓ʷa** kʷ=tih-mut tinput s=χʷuχʷuɬ
sink-MD-PST=RPT DET=big-INT steam.boat NMLZ=long.time
'The big steamboat sank a long time ago.' vf

To account for the ʔayʔaǰuθəm reportative, I therefore adopt the partition of the kernel proposed in Matthewson (2010), allowing direct sensory evidence to be referenced apart from direct information in general.

The semantics for *k̓ʷa* proposed in (67) does not straightforwardly predict the ability of the speaker to utter *p* without believing *p* to be true. Recall that we attributed this possibility to perspective shift, following AnderBois (2014). Within von Fintel and Gillies' framework, this can be implemented by allowing the kernel for the at-issue content to be that of the reporter, rather than the speaker. The presupposed content remains anchored to the speaker. So, for example, (68) (repeated from (26)) signals that the speaker has reported evidence for the prejacent and does not have direct information that settles the prejacent. The claim that Freddie won is attributed to the reporter.

(68) *Context: There was a rumour that Freddie won the lottery, but I talked to him and found out the rumour is not true. Later we're talking about this and I say:.*

ʔƛ̓ʊxʷʔəm **k̓ʷa** Freddie qəχ tala. xʷaʔak̓ʷʊt!
ƛ̓əxʷ-ʔəm=**k̓ʷa** Freddie qəχ tala. xʷaʔ+k̓ʷa+ʔut
win-ACT.INTR Freddie lots money NEG=RPT=EXCL
'Freddie won a lot of money (I heard), but it turns out not! sf

Formally, the perspective shift of (68) could be achieved with a perspective shift operator. Adding a *P-Sh* operator to (68), we would get (69). The *P-Sh* operator shifts the anchoring of the kernel for the at-issue content from the speaker to the salient individual who made the report.

(69) *P-Sh*($[\![\acute{k}^{wa}$ (68) $]\!]^{c,w,g,K^s_w}$) is defined only if:

i. K^s_w contains a proposition of the form 'someone$_i$ said Freddie won the lottery'.

ii. If defined, *P-Sh*($[\![\acute{k}^{wa}$ (68) $]\!]^{c,w,g,K^s_w}$) = 1 iff $B_{K'^{i}_{w}} \subseteq [\![\phi]\!]^{c,g}$

In (69), I have not included the reportative's presupposition that the speaker's kernel does not contain direct information settling whether the prejacent is true (as in (66ii)). This is because I have not yet directly investigated whether this presupposition survives in the perspective shift cases. It seems likely that the speaker could have direct evidence settling that the prejacent is not true (but the cases we have seen, such as (68), involved indirect evidence). If this is the case, there are a few possible solutions. One is to treat this requirement as a cancellable implicature, as in Matthewson (2015) (see footnote 22). Another option is to modify the requirement so that it only mandates that the speaker's kernel does not settle whether the prejacent is true (but allows it to be settled as false). Of course, this depends on whether the converse is possible – whether the speaker can have direct evidence settling that the proposition is true – in perspective shift cases. I leave this for future research.

Of course, representing perspective shift with the *P-Sh* operator does not add much. To be descriptively adequate we would need to capture the conditions governing where the *P-Sh* operator can be used, while to be explanatory, we would have to be able to derive these in a principled way. This will have to wait for future work. For now, I can only reiterate that in order for perspective shift to felicitously occur, particularly where the speaker does not believe the prejacent to be true, there must be contextual and linguistic cues, typically some sort of evaluative language, that such a shift has taken place (as pointed out in AnderBois 2014). This ensures that the addressee understands that the shift has occurred. The reason that perspective shift is possible with the reportative, but not other evidentials, is because the reportative itself introduces another perspective holder – the source of the report – meaning that the reportative inherently facilitates perspective shift (AnderBois 2014). Where perspective shift occurs, the approach proposed here essentially means allowing the reportative to have an informational modal base, as suggested for the German reportative *sollen* in Kratzer (2012) (see also discussion in Matthewson 2012). The availability of an informational modal base is pragmatically restricted, however, as it is predicted to be found only in contexts where perspective shift is possible.[26]

[26]Another possibility, raised by an anonymous reviewer, is that the speaker's kernel for the reportative consists of a set of propositions uttered by the reporter. That is, the kernel for the reportataive is always a potentially unrealistic modal base consisting of the reports received from some salient individual. My hesitation with this approach is that it predicts any proposition that the speaker has heard from a third party to be felicitous with $\acute{k}^{wa}$, provided the speaker does not have direct information that settles whether the proposition is true. It does not predict the infelicity that arises in cases like (25). This approach may be rescued with additional pragmatic factors, but then it is not so clear how this approach differs from an analysis in terms of perspective shift, at least as sketched here, and whether the two approaches make different predictions.

6 Conclusion

In this chapter, I have argued that the inferential clitic *c̓̌ɛ* and the reportative clitic *k̓ʷa* in ʔayʔaǰuθəm are epistemic modals. In order to establish their modality, I identified and implemented three diagnostics to probe whether these evidentials contribute to the at-issue content of the clause: 1) embeddability, 2) challengeability, and 3) the status of continuations entailed by the prejacent. The first two of these diagnostics appear frequently in previous literature and were discussed critically in terms of how they are applied and what they show; the third was introduced as a novel test. The results of these three tests indicated that both the inferential and the reportative contribute to the at-issue content of the clause and are best analyzed as epistemic modals. The reportative shows certain unexpected behaviours for this analysis, such as allowing the speaker to utter the prejacent without believing it to be true. I proposed that these facts are best understood in terms of perspective shift (AnderBois 2014). Finally, I adopted a formal analysis from von Fintel and Gillies (2010) and Matthewson (2010), and suggested how perspective shift might be implemented using this approach.

The fact that these ʔayʔaǰuθəm evidentials behave as epistemic modals provides further evidence for a tight link between evidentiality and epistemic modality (contra De Haan 1999; Aikhenvald 2004). Evidentials from a wide range of languages have now been argued to encode epistemic modality, including St'át'imcets (Matthewson et al. 2007), Gitksan (Peterson 2010), Tagalog (Tan Almazán 2019), Bulgarian (Izvorski 1997), Tibetan (Garrett 2001), a.o., though in many of these analyses modal evidentials are argued to co-exist with nonmodal evidentials, even within the same language. In this chapter, I argued that certain behaviours used to argue for a nonmodal analysis of evidentials do not in fact distinguish between modal and nonmodal evidentials (in part following AnderBois 2014; Tan Almazán 2019), while other tests that have been criticized in previous literature can in fact distinguish between the two types of evidentials if applied carefully. It remains an interesting question to what extent epistemic modality and evidentiality overlap and whether these should actually be considered distinct categories (Matthewson 2012; von Fintel and Gillies 2010; Kratzer 2012).

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