

Evidence about evidentials: Where fieldwork meets theory

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1. Introduction¹

This paper addresses the empirical relationship between the two conceptually distinct classes of evidentials and epistemic modals. Recent literature has advanced a range of different opinions on this matter, including complete disjointness (de Haan 1999, Lazard 2001, Aikhenvald 2004), overlap (Faller 2002, 2006, 2011, Matthewson et al. 2007, McCready and Ogata 2007, Murray 2010, Peterson 2010, among others) and inclusion (von Stechow and Gillies 2010, Kratzer 2010).

In this paper I will argue for the strongest possible position, namely that the two classes are identical: all evidentials are epistemic modals, and vice versa. The discussion is based on a small number of languages, and focuses in most detail on one apparently non-modal evidential in St'át'imcets (Lillooet Salish). The logic of the argument will suggest that we should seriously consider the idea that apparently non-modal evidentials are actually modal after all. The discussion will also frequently touch on issues of linguistic evidence, in the sense of the current volume –how we can and should gather the appropriate data on evidentials, how we interpret our results, and how the facts do or do not directly impact analysis.

The structure of the paper is as follows. The remainder of the introduction provides background on evidentials, as well as on the research program within which the current paper sits, and the methodologies used in data collection. Section 2 provides a brief overview of the relevant prior literature. In section 3 I introduce the St'át'imcets evidential which forms the main focus of the paper: *lákʷ7a*. Section 4 provides the evidence that *lákʷ7a* is non-modal, but section 5 argues that the tests which classify *lákʷ7a* as non-modal are faulty. In section 6 I apply other modality tests to *lákʷ7a* and show that it patterns as a modal. Section 7 examines some non-modal evidentials discussed in the literature, and section 8 concludes.

2 *Error! Style not defined.*

1.1. Background on evidentials and epistemic modals

An evidential is an element which encodes information about the speaker's source of evidence for the proposition being advanced. One example is the Cuzco Quechua reportative, illustrated in (1).

- (1) *Marya-qa yachay wasi-pi-s ka-sha-n*
Marya-TOP know house-LOC-RPT be-PROG-3
'Marya is at school.' (the speaker was told this) (Faller 2002:22)

The definition of an evidential is conceptually distinct from that of an epistemic modal, which is an element which introduces quantification over epistemically accessible possible worlds. One example is English *must*.

- (2) *Maria must be at school.*
In all stereotypical worlds compatible with the speaker's knowledge, Maria is at school.

Evidentials vary in their properties both cross-linguistically and within languages, and recent literature advances several different formal approaches to their analysis (cf. Izvorski 1997, Faller 2002, Davis et al. 2007, Portner 2006, McCready and Ogata 2007, among many others). Common to all analyses is a distinction between what I will call (following Murray 2010) the *evidential contribution* and other aspects of the evidential's meaning. The evidential contribution is the evidence requirement itself – for the reportative in (1), the requirement that the speaker obtained the relevant knowledge through report from another person. Other aspects of the evidential's meaning concern the status of the evidential's scope – whether it is asserted, asserted to be a possibility or a necessity, or whether it is advanced within a different speech act. The distinction between the evidential contribution and other aspects of meaning will become relevant below when we try to detect whether or not evidentials contribute a modal as part of their semantics.

1.2. The research program

The research program within which the current work is embedded has the goal of discovering which aspects of semantics are universal, and the nature

and extent of cross-linguistic variation. The program by its very nature requires cross-linguistic data.

There are a number of challenges involved in gathering cross-linguistic semantic data; see Matthewson (2004), Krifka (in press) for discussion. One reward of cross-linguistic data collection is the significance of the empirical contribution which can be made. This is particularly so given that 90% of the world's languages are endangered, and many endangered languages are under-studied from a formal perspective. Furthermore, data from languages dissimilar to Indo-European can impact linguistic theory in dramatic ways. Table 1 lists some discoveries of the research program so far. Since this table lists my own findings, many of the claims are controversial. However, it is clear that we neither find cross-linguistic uniformity, nor cross-linguistic randomness. The interest of the program lies in finding exactly where the differences lie and what constrains them.

Table 1. Discoveries of the cross-linguistic semantics research program so far

<i>Languages vary in their ...</i>	<i>more/less than one might think</i>
determiners	more (Matthewson 1998)
tense systems	less (Matthewson 2006b)
aspectual classes	more (Bar-el et al. 2005)
modals	more and less (Rullmann et al. 2008)
presuppositions	more (Matthewson 2006a, 2008)
evidentials	less (Matthewson 2009a, the current paper)

1.3. Methodology

The language from which the fieldwork data in this paper are drawn is St'át'imcets, a Northern Interior Salish language spoken in British Columbia, Canada, by fewer than 50 speakers, all over the age of 70. Literacy in the language is uncommon. These demographic facts make large-scale experiments impossible.

The methodology of data collection consists of one-on-one intensive fieldwork with consultants. The main data collection method is the Felicity Judgment Task, which is very similar to the Truth Value Judgment Task (e.g., Crain and McKee 1985, Crain and Thornton 1998). There is a difference in style, in that with adult consultants we do not usually use puppets; instead, consultants judge the acceptability of utterances in contexts which are described verbally, or using pictures, props or storyboards. The re-naming of the task reflects the fact that the consultant does not give a

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judgment of ‘true’ or ‘false’, but rather an acceptability judgment.² Acceptability entails truth in a context (consultants never accept a sentence which is false in the given context), but unacceptability may arise for different reasons, including falsity, presupposition failure, or other pragmatic inappropriateness. The researcher often discusses the utterance with the consultant in more detail, eliciting comments on the acceptability level, how they interpret the utterance, why they feel it is unacceptable, how either the sentence or the context can be repaired, etc.

2. Previous proposals

At the opposite end of the spectrum from the proposal to be made here is the claim that evidentials and epistemic modals are completely disjoint sets; see de Haan (1999), Lazard (2001), Aikhenvald (2004). According to de Haan (1999), evidentiality encodes the source of the information presented, while epistemic modality encodes the degree of commitment on the part of the speaker to the truth of the information. Any element which distinguishes *only* information-source is therefore not a modal. Since elements which primarily encode information source don’t usually encode degree of commitment, this view leads to a disjointness picture. Similarly, Aikhenvald (2004:7) writes that evidentiality and modality are ‘fully distinct categories’, with the latter necessarily relating to the degree of certainty.

This view cannot be right. First, the premise is wrong: modals do not necessarily encode degree of commitment. As shown by Matthewson et al. (2007), Rullmann et al. (2008), and Davis et al. (2009), *all* modals in St’át’imcets, including epistemics, deontics, pure circumstantials and futures, fail to encode distinctions of speaker certainty or commitment. Peterson (2010) shows the same for certain modals in Gitksan (Tsimshianic).

Furthermore, the claim that evidentials and epistemic modals are fully distinct is unlikely to be correct, given the many extant analyses of evidentials as epistemic modals; see Kratzer (1991), Izvorski (1997), Garrett (2001), Ehrich (2001), Rooryck (2001), McCready and Asher (2006), McCready and Ogata (2007), Matthewson et al. (2007), Faller (2006), Peterson (2010), among others. One example of a modal evidential is the St’át’imcets inferential *k’a*, illustrated in (3).³

- (3) Context: You are a teacher and you come into your classroom and find a nasty picture of you drawn on the blackboard. You know that Sylvia likes to draw that kind of picture.

nilh=k'a núkun' k=Sylvia ku=mets-cál ti=piktsh=a láku7
 FOC=INFER again DET=Syl. DET=write-ACT DET=pict.=EXIS DEIC
 'It must have been Sylvia who drew the picture.'

k'a is an evidential, because it requires the speaker to have inferential evidence for the proposition. In (3), the speaker cannot have witnessed Sylvia drawing the picture. *k'a* is also an epistemic modal, because it passes a range of tests for being a modal (i.e., for having a truth-conditional effect involving quantification over possible worlds). See Matthewson et al. (2007) and below for extensive discussion of these tests.

The conclusion so far is that at least *some* evidentials are modals.

Some evidentials have been claimed *not* to be epistemic modals, and these are the interesting ones in the current context. Non-modal evidentials in Quechua are analyzed by Faller (2002) as illocutionary operators. They operate at the level of speech acts, modifying the felicity conditions of an utterance, rather than at the level of propositional content. Murray (2010) argues that evidentials in Cheyenne (Algonquian) also perform an illocutionary function. For Murray, unlike for Faller, the evidential contribution is part of truth-conditional content, rather than a felicity condition. However, it is 'not-at-issue' content (cf. Potts 2005, Simons et al. 2009) – content which is not up for negotiation by interlocutors. While these two analyses differ on the nature of the evidential contribution, they share the claim that the scope of the evidential is not a modal proposition. See also Peterson (2010) for an illocutionary analysis of one Gitksan evidential.

One of Faller's (2002) main empirical arguments that the Quechua reportative *-si* is non-modal is that unlike epistemic modals, it is compatible with the assertion that the proposition is false. This is illustrated in (4).

- (4) *pay-kuna-s ñoqa-man-qa qulqi-ta muntu-ntin-pi saqiy-wa-n,*
 (s)he-PL-RPT I-illa-TOP money-ACC lot-INCL-LOC leave-10-3
mana-má riki riku-sqa-yui ni un sol-ta centavo-ta-pis
 not-SURP right see-PP-2 not one sol-ACC cent-ACC-ADD
saqi-sha-wa-n-chu
 leave-PROG-10-3-NEG
 'They [reportedly] left me a lot of money, but, as you have seen, they didn't leave me one sol, not one cent.' (Faller 2002:191)

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Similarly, one of Murray's (2010) main arguments that the Cheyenne reportative is not modal is that the scope of the reportative can be false.

- (5) *é-hó'tâheva-sèstse Floyd naa oha é-sáa-ho'tâheva-he-Ø*
 3-win-RPT.3SG Floyd and CRST 3-NEG-win-MOD_A-DIR
 'Floyd won, I hear, but I'm certain he didn't.' (Murray 2010:103)

The Quechua and Cheyenne reportatives differ in this respect from English epistemic modals, as shown in (6). (7) shows that the St'át'imcets modal reportative patterns like an English modal (Matthewson et al. 2007).

- (6) #*They must/might have left me a lot of money, but, as you have seen, they didn't leave me one cent.*

- (7) Context: You had done some work for a company and they said they put your pay, \$200, in your bank account. But actually, they didn't pay you at all.

um'-en-tsal-itás=ku7 *i=án'was=a* *xetspqíqen'kst*
 give-DIR-1SG.OBJ-3PL.ERG=RPT DET.PL=2=EXIS hundred
táola t'u7 aoz kw=s=7um'-en-tsal-itas ku=stam'
 dollar but NEG DET=NOM=give-DIR-1S.OBJ-3PL.ERG DET=what
 '[reportedly] They gave me \$200, but they didn't give me anything.'

If some evidentials *are* epistemic modals, and some are *not* (Faller 2003, 2006, Matthewson et al. 2007), a natural conclusion is that we have an overlap relation between the classes. According to this idea, some evidentials are non-modal, and some epistemic modals are non-evidential.

However, there is reason to believe we can make a stronger claim. Von Fintel and Gillies (2010) argue that *all* epistemic modals carry evidential meaning. Focussing on English *must*, they argue that this modal encodes an indirect evidence requirement. (8) is felicitous, because the speaker's evidence is indirect; (9) is infelicitous, because the evidence is direct.

- (8) Chris has lost her ball, but she *knows* with full certainty that it is in either Box A or B or C. She says:
The ball is in A or B or C.
It is not in A ... It is not in B.
So, it must be in C. (von Fintel and Gillies 2010:362)

- (9) [Seeing the pouring rain.]
It's raining.

?? *It must be raining.*

(von Fintel and Gillies 2010:353)

In a similar vein, Kratzer (2010:3) argues that the combination of evidential and modal meaning components into a single lexical item ‘*construct[s]*’ what are traditionally called “epistemic modals”. Thus, the presence of an evidential contribution is what *makes* a modal epistemic. This viewpoint entails that there are no non-evidential epistemic modals.

If these proposals are correct, then we have an inclusion relation: epistemic modals are a subset of evidentials. My plan now is to take the final step and propose that the two classes are identical. I will argue that much of the evidence which has been advanced for the non-modal status of evidentials rests on mistaken assumptions. I will illustrate this with respect to one St’át’imcets evidential, *lákwa*, which at first sight looks non-modal.

3. *Lákwa*: basic data

Lákwa is, to my knowledge, the only St’át’imcets evidential which displays apparently non-modal properties. Historically, it is a locative adverb, but also functions synchronically as an evidential which signals an absence of visual evidence for the proposition. A simple example is given in (10).

- (10) *wa* *lákwa* *u7s7-ám*
 IMPF *lákwa* egg-MID
 ‘It’s laid an egg (by the sound of it).’

According to van Eijk (1997:171), ‘*Lákwa* ‘generally refers ... to a smell, a sound, or some other sensation.’ Davis (2006) writes that *lákwa* is used when one senses something (either by hearing, smelling, or tasting) but cannot see it. And according to Matthewson (2009b, 2010a), *lákwa* requires the speaker to have sensory evidence for the proposition being advanced, but disallows visual evidence of the eventuality itself.

The requirement that there be sensory evidence for the proposition is illustrated in (11-16): (11-12) involve hearing, (13-14) taste, (15) smell, and (16) touch. In accordance with the evidential contribution of *lákwa*, I will henceforth gloss it as SNV ‘sensory non-visual’.

8 *Error! Style not defined.*

(11) *wa7 lákw7a ku=ts7ás=a*
 be SNV DET=come=EXIS
 ‘Someone’s coming.’
 (The speaker can hear them, but not see them.) (Davis 2006)

(12) *wa7 lákw7a k=wa=ílal*
 be SNV DET=IMPF=cry
 ‘It sounds like somebody is crying over there.’

(13) *áma lákw7a!*
 good SNV
 ‘That tastes good!’ (Davis 2006)

(14) *wa7 lákw7a ku=sq’áq’pa7 lts7a ti=ts’i7=a*
 be SNV DET=dirt here DET=meat=EXIS
 ‘This meat tastes as if there’s dirt in it.’ (said while trying to eat it)

(15) *tsem-s=kán lákw7a ti=ts’i7=a*
 burn-CAUS=1SG.SUBJ SNV DET=meat=EXIS
 ‘I burnt the meat.’ (Context: you smell it)

(16) Context: You are blindfolded. I ask you to tell me which of three cups a stone is in. You feel around and feel the stone and you say:
nilh lákw7a lts7a
 FOC SNV here
 ‘It’s in this one.’

Cases where the speaker has sensory evidence from the *results* of the eventuality are also allowed; this is illustrated in (17-18).

(17) *cw7áy=t’u7 lákw7a k=s=cin’=s kw=s=wá7*
 NEG=just SNV DET=NOM=long.time=3POSS DET=NOM=be
l=ti=qú7=a – wá7=t’u7 wa7 k’ac
 in=DET=water=EXIS IMPF=just IMPF dry
 ‘It couldn’t have been under the water long – it’s dry!’ (Speaker didn’t witness how long it was under the water, but feels the dryness.)

- (18) Context: You are a teacher and you come into your classroom and find a nasty picture of you drawn on the blackboard. You look around and you see that only one child has got chalk dust on her hands, Sylvia.

niłh lákw7a s=Sylvia ku=xilł-tal'i
 FOC SNV NOM=Sylvia DET=do(CAUS)-TOP
 'Sylvia must have done it.'

Notice that in (18), the speaker is basing her claim on visual evidence; however, it is not visual evidence of the *event itself*, but rather of its results.

The generalizations given about *lákw7a*'s evidential contribution predict that visual evidence of the eventuality itself is disallowed; this is shown in (19). (19) is rejected if the speaker sees the hearer shivering and being sweaty – arguably visual evidence of the sickness – but accepted if the speaker hears the hearer coughing.

- (19) *áolsem=lhkacw lákw7a*
 sick=2SG.SUBJ SNV
 'You must be sick.'

The generalizations also predict that pure inference or reasoning, in the absence of any sensory evidence, is disallowed; this is shown in (20-21).

- (20) Context: You are a teacher and you come into your classroom and find a nasty picture of you drawn on the blackboard. You know that Sylvia likes to draw that kind of picture.

niłh lákw7a s=Sylvia ku=xilł-tal'i
 FOC SNV NOM=Sylvia DET=do(CAUS)-TOP
 'It must have been Sylvia who did it.' (Corrected to inferential *k'a*.)

- (21) Context: I show you a coin and three small cups. I put the coin under one of the cups and then I mix them around and around very fast so you can't see any more which one it's under. I ask you to guess. You guess one cup, and I lift it up and show you that it's not under there. You guess a second one, the same. You point at the last cup and say:

láti7 lákw7a lh=as legw
 there SNV COMP=3SBJN hide
 'It must be under that one.' (Volunteered with inferential *k'a*.)

In previous work (Matthewson 2009b), I argued that *lákw7a* is a non-modal evidential. In the next section I will outline the evidence which led me to believe that *lákw7a* was non-modal.

4. Evidence that *lákw7a* is non-modal

In this section I apply two modal tests to *lákw7a*, showing that on both of them, it appears to function as a non-modal.⁴ The first test is the one already introduced above: (in)felicity if the embedded proposition is known to be false. The idea behind the test is as follows. An epistemic modal asserts that given the speaker's knowledge, the embedded proposition is possibly or necessarily true. Therefore, it should be impossible to use an epistemic modal if the speaker knows the embedded proposition is false.

It was shown in section 2 that the Quechua and Cheyenne reportatives allow their scope to be known to be false. Faller observes (2002:194) that 'In contrast, a speaker using English epistemic *may* or *must* cannot know for a fact that the embedded proposition is not true.' As predicted, the St'át'imcets modal evidentials are infelicitous in the relevant contexts, as shown in (7) above for the reportative, and in (22) for the inferential:

- (22) **t'éc=k'a=t'u7* *ku=páoy, t'u7 áoz=t'u7 kw=a=s* *áma*
 tasty=INFER=just DET=pie but NEG=just DET=IMPF=3POSSgood
 * 'The pie might/must have been good, but it wasn't good.'

In contrast, *lákw7a* is acceptable if its scope is known to be false, as shown in (23), which forms a minimal pair with (22).

- (23) Context: It smelled as if the pie was good, but there was too much salt so it was actually horrible.

t'éc=t'u7 lákw7a ku=páoy, t'u7 áoz=t'u7 kw=a=s *áma*
 sweet=just SNV DET=pie but NEG=just DET=IMPF=3SPOSS good
 'The pie seemed good, but it wasn't good.'

(24-25) give further evidence that *lákw7a* behaves like a non-modal evidential on this test. In each case, the modal inferential *k'a* is unacceptable.

- (24) Context: It sounded like someone was walking around outside, but it was actually only the wind.

wa7 **lákwa7a** / * **k'a** ku=mám'teq láku7 áłts'q7=a, t'u7
 be SNV / INFER DET=walk DEIC outside=EXIS but
 nilh=a cwilh=t'u7 ti=sk'exem=a wa7 qan'im-ens-an
 FOC=A after.all=just DET=wind=EXIS IMPF hear-DIR-1SG.ERG
 'It sounded like someone was walking outside, but it was the wind.'

- (25) Context: When you left the house there were dirty dishes in the sink and a dirty floor. When you come home, it's spotless. You know that Eddy doesn't know how to clean and never has and never will.

o, ts'ex-n-ás **lákwa7a** / * **k'a** ti=tsítcw=a k=Eddy
 oh clean-DIR-3ERG SNV / INFER DET=house=EXIS DET=Eddy
 'Looks like Eddy cleaned up.'

The second modal test is the inverse of the first: whether the evidential is felicitous if the proposition in its scope is known to be *true* (McCready and Ogata 2007, Matthewson et al. 2007, Matthewson 2009a, 2010a). The idea behind this test is that Gricean reasoning prevents a speaker from using an epistemic modal if they are in a position to assert the plain, unmodalized proposition, since the latter is usually assumed to be semantically stronger (although see von Stechow and Gillies 2010 and discussion below). This test is implicitly applied by Faller (2002:155-6) and Murray (2010:23; 218); they both argue that direct evidentials cannot be modal because direct evidentials *strengthen* the proposition expressed, while modals – even necessity modals – *weaken* it (as is standardly assumed; see Kratzer 1991, among many others). If modals have a semantic weakening effect, Grice's quantity maxim will predict infelicity in contexts where the speaker is sure that the scope is true.

As shown in (26-27), *lákwa7a* is felicitous if its scope is known to be true. It contrasts in this respect with *must*; observe that the felicitous English translations in these contexts lack a modal. See Matthewson et al. (2007) for evidence that the St'át'imcets modal evidentials are infelicitous in this type of context.

- (26) Context: You are blindfolded. I ask you to tell me which of these three cups the stone is in. You feel around and feel the stone.

nilh **lákwa7a** łts7a
 FOC SNV here
 'It's in this one.' (Consultant mimes putting hand on the stone)
 Infelicitous English translation: # It **must** be in this one.

12 *Error! Style not defined.*

(27) Context: You just checked on your kids 10 seconds ago and saw they were sleeping. The phone rings and your friend asks if the kids are asleep. You can hear snoring coming from their room. You say:

iy, lán=wit lákw7a wa7 guy't
yes already=3PL SNV IMPF sleep

‘Yes, they’re already asleep.’

Infelicitous English translation: # They **must** be already asleep.

The results from the two tests discussed in this section seem clear – *lákw7a* cannot be a modal. However, I will argue in the next section that neither of these two tests provides a strong argument against modal status.

5. These are not good arguments

The first test – whether the evidential is felicitous if its scope is false – is not a convincing argument against modal status. This follows from the analysis in Kratzer (2010), according to which epistemic modals differ on exactly this point, with some passing, and some failing, the test.

As a brief background, recall that according to Kratzer (1981, 1991), modals are interpreted with respect to conversational backgrounds, which may be provided by context and which narrow down the set of worlds being quantified over by the modal. Thus, on an epistemic interpretation of (28), the conversational backgrounds restrict us to considering only worlds compatible with the speaker’s knowledge, and in which things happen as normally expected. (28) claims that in all of these, Maria is at school.

(28) *Maria must be at school.*

For independent reasons, Kratzer (2010) argues that the modals we typically call ‘epistemic’ have two different possible kinds of conversational background: realistic, or informational. Crucially, only realistic backgrounds are predicted to rule out a known-to-be-false embedded proposition. The two types of conversational background are defined in (29-30).

(29) A realistic conversational background: a function f such that for any w in the domain of f , there is a body of evidence in w that has a counterpart in all $w' \in \cap f(w)$. (Kratzer 2010:12)
in view of the available evidence; given the evidence

(30) An informational conversational background: a function f such that for any w in the domain of f , $f(w)$ represents the content of some salient source of information in w .

according to the content of ... (Kratzer 2010:13)

(31) has a realistic conversational background; it asserts that in all worlds in which there is the same rumour as in the actual world, Roger was elected.

(31) *Given the rumour, Roger **must** have been elected chief.*

Since the actual world is a world in which there is this rumour, the speaker of (31) makes a strong claim about the actual world. As such, (31) is correctly predicted to be infelicitous if the speaker knows that the embedded proposition (that Roger was elected) is false.

In contrast, (32) has an informational conversational background.

(32) *According to the rumour, Roger **must** have been elected chief.*

(32) claims that Roger was elected all the worlds compatible with the rumour – in other words, it makes a claim about the content of the rumour. It does not say anything about whether Roger was elected in the actual world. As such, (32) is correctly predicted to be felicitous even if the speaker is sure that Roger was not elected.

The realistic/informational split within epistemic conversational backgrounds has significant consequences for the first modal test. Since informational epistemic modals are felicitous if the embedded proposition is known to be false, the felicity of such cases provides no argument that an evidential is non-modal. It can only show that the evidential may have an informational conversational background. Kratzer herself applies this idea to evidentials, arguing that while the St'át'imcets reportative *ku7* has a realistic conversational background (and is incompatible with the speaker knowing that the scope is false), the German reportative *sollen* has an informational conversational background (and is compatible with the speaker knowing that the scope is false). This falls nicely into line with recent proposals that modals in certain languages lexically encode restrictions on conversational background (e.g., Rullmann et al. 2008, Vander Klok 2008, Reis Silva 2009, Peterson 2010).

The second modal test was whether the evidential is felicitous if its scope is known to be true. I showed above that *lákw7a* is felicitous in such contexts, and that it contrasts in this respect both with English *must* and with St'át'imcets modal evidentials. However, knowing that the embedded proposition is true is not always sufficient to render modals infelicitous. This was shown by von Fintel and Gillies' case of Chris with her lost ball in (8); based on the process of elimination Chris is certain that her ball is in Box C, yet she is still able to use *must*. Recall that according to von Fintel and Gillies, *must* requires not that the speaker be less than certain, but that the speaker's evidence be indirect. Applying the same reasoning, I argue that the reason *lákw7a* and *must* differ in cases like (26) (the 'feeling the stone' case) is that they have different evidential contributions. Non-visual sensory evidence always licenses *lákw7a*. But for *must*, feeling the stone is an illegitimate type of evidence (too 'direct').⁵

I conclude that the truth of the embedded proposition is invalid as a way of showing that an evidential is non-modal. It can only show that the evidential has a different evidential contribution from some other modals.

Summarizing so far, we have seen that *lákw7a* differs from the clearly modal St'át'imcets evidentials in allowing its scope to be known to be false, or known to be true. However, since both of these modality tests have been shown to be flawed, it is still possible that *lákw7a* is a modal. Following similar reasoning to that given here (originally found in Matthewson 2009a), Faller (2011) also concludes that it is possible (though according to her, not necessarily desirable) to give a modal analysis for all Quechua evidentials.

In the next section I turn to other tests which have been used to distinguish modal from non-modal evidentials.

6. Other modal tests

A number of other tests have been advanced in the literature for distinguishing modal from non-modal evidentials. Faller (2002, 2003, 2006), Matthewson et al. (2007), Papafragou (2006), Waldie et al. (2009), Peterson (2010) and Murray (2010) all provide extensive discussion of these tests, and of their results when applied to specific evidentials. Here I will concentrate on the two main tests which distinguish modal from non-modal analyses, namely whether the evidential can be semantically embedded under propositional operators, and whether the evidential has modal content

which can be directly challenged. I will briefly touch on another test, behaviour in questions, in section 7.

6.1. Embeddability

The idea behind this test is that if an element can be semantically embedded under a propositional operator, it contributes to (at-issue) propositional content, and hence cannot be an illocutionary operator (although see Krifka 2004, 2010). With respect to *lákwa7a*, the embedding test gives a clear result: *lákwa7a* does semantically embed. (33) shows *lákwa7a* embedding under the verb ‘say’. The consultant’s comment shows that it is the embedded subject whose non-visual evidence leads to the use of *lákwa7a*.

- (33) Context: Your friend was babysitting your nephew and niece and at one point she heard a slapping sound from the next room. After that, the boy had a red mark on his face. She tells you when you get home that she thinks the girl hit the boy. You tell the mother of the kids:

tsut n-snúk’w7=a kw=s=túp-un-’as lákwa7a
 say 1SG.POSS-relative=EXIS DET=NOM=hit-DIR=3ERG SNV
s=Maria ta=sésq’wez’-s=a
 NOM=Maria DET=younger.sibling-3SG.POSS=EXIS
 ‘My friend said that Maria must have hit her younger brother.’

Consultant’s comment: “Yes, because she didn’t see it and she’s not very sure.”

Even more strikingly, (34) shows *lákwa7a* semantically embedding inside the antecedent of a conditional.

- (34) Context: You want your daughter to collect the eggs, but she’s lazy. She doesn’t want to go outside. You are sitting around and there is a squawking from the henhouse. Your daughter says (a); you reply (b):

a. *lan lákwa7a wa7 íks-am ti=tsíken=a*
 already SNV IMPF egg-MID DET=chicken=EXIS
 ‘It sounds like the chicken laid an egg.’

16 *Error! Style not defined.*

- b. *lh=lán=as lákw7a wa7 íks-am, nas zam' áts'x-en!*
 if=already=3SBJN SNV IMPF egg-MID go after.all see-DIR
 'If it sounds like the chicken laid an egg, then you just go and check it!' (Consultant's volunteered English translation)

The context and the consultant's translation make clear that the daughter is being asked to check the henhouse if it even *sounds* like there might be eggs. This is a semantically embedded interpretation for *lákw7a*. Another example involving a conditional antecedent is given in (35).

(35) Context: You are alone in the house at night and you call your neighbour on the phone. You say (a); your friend replies (b):

- a. *wa7 lákw7a k=wa mám'teq láku7 áts'q7=a. kan*
 IMPF SNV DET=IMPF walk DEIC outside=EXIS YNQ
kw=en ka-nás-a áta7 tsítcw-sw=a
 DET=1SG.POSS CIRC-go-CIRC DEIC house-2SG.POSS=EXIS
 'It sounds like someone is walking outside. Can I come to your place?'
- b. *lh=wá7=as lákw7a ku=wa7 mám'teq láku7*
 if=be=3SBJN SNV DET=IMPF walk DEIC
áts'qa7-sw=a, áma=kélh=t'u7séna7 k=wá=su
 outside- your =EXIS good=FUT=just COUNTER DET=IMPF=your
ts7as ets7á n-tsítcw=a. lh=cw7áoz=as k=wá=su
 come DEIC my-house=EXIS if=NEG=3SBJN DET=IMPF=your
ts7as, ptinus-em-sút=kacw=kelh tákem sgáp=a.
 come think-MID-OOC=2SG.SUBJ=FUT all night=EXIS
 'If it sounds like someone is walking around there, you should come to my place, because otherwise you'll worry all night.'

Accepted if the friend doesn't believe there is someone outside.

The fact that *lákw7a* embeds inside conditional antecedents means that it displays even stronger evidence for contributing to at-issue propositional content than the clearly modal *St'át'imcets* evidentials (see Matthewson et al. 2007), but patterns similarly to a range of Japanese evidentials discussed by McCready and Ogata (2007) (and analyzed by them as modals):

- (36) *Taro-ga kuru yoo da-ttara osiete kudasai*
 Taro-Nom come EVID Cop.Pres-COND teach please
 ‘If it looks like Taro will come, please tell me.’

(McCready and Ogata 2007:167)

One important question, which I must leave open for now, is whether the evidential contribution itself actually scopes under the ‘if’, or whether only the modal claim (that there might or must be an egg-laying, or someone walking outside) embeds. In (36), the sentence as a whole is neutral with respect to whether the relevant evidence exists (McCready and Ogata 2007:178). That is, the evidential contribution semantically embeds in Japanese (and thus is part of the propositional content). It is difficult to test this for St’át’imcets *lákw7a*, due to the independent difficulty of detecting not-at-issue content in this language (Matthewson 2006a, 2008). However, it may be significant that the cases of embedded *lákw7a* all appear in contexts in which the evidential contribution has just been introduced by the previous speaker, as in (34) and (35).⁶

6.2. Challengeability

The idea of this test, also called the assent/dissent test (see Papafragou 2006), is that if an element of meaning can be questioned, doubted, or (dis)agreed with using ‘that’s (not) true’, it contributes to the (at-issue) truth conditions of the proposition expressed. The way Faller introduces this test is shown in (37) (from Faller 2002:112/20066:10).

- (37) A: *It’s snowing down here, so Truckee must be buried in snow.*
 B: *That’s not true. A hundred years or so ago, it snowed down here, but not a single flake in Truckee. So, it could well be that it’s not snowing now in Truckee.*

Here, B challenges A’s modal claim, namely that in all worlds in which it’s snowing here, it’s snowing in Truckee. B claims that it is possible for it to be snowing here, yet not snowing in Truckee. Crucially, B isn’t challenging A’s embedded proposition: B is not asserting that it *isn’t* snowing in Truckee. If an evidential is subject to this kind of challenge, it is probably a modal. Faller argues that the Quechua conjectural does, but the other Quechua evidentials do not, pass the challengeability test.

The validity of this test as a way of distinguishing illocutionary from modal evidentials has been challenged in the literature. Murray (2010:79) claims that ‘illocutionary and epistemic evidentials behave the same on this diagnostic, so it cannot be used to argue that one contributes to the truth conditions while the other does not.’ Murray is referring to the correct observation (also pointed out by Matthewson et al. 2007, Waldie et al. 2009), that the *evidential contribution* can in most languages not be challenged using ‘that’s not true’. The same is true of *lákw7a*, as shown in (38).

- (38) A: *tsém-s=kacw lákw7a ti=ts’í7-sw=a*
 burn-CAUS=2SG.SUBJ SNV DET=meat-2SG.POSS=EXIS
 ‘[It smells like] you burnt your meat.’
 B: # *aoz kw=s=wenácw. áts’x-en=lhkacw ti=n-ts’í7=a*
 NEG DET=NOM=truesee-DIR=2SG.SUBJ DET=my-meat=EXIS
 ‘That’s not true. You saw it.’

This is expected under any analysis in which the evidential contribution is not part of at-issue truth-conditional content (whether it is a presupposition, a sincerity condition, or not-at-issue propositional content).⁷

However, the challengeability test does work to distinguish modal from non-modal evidentials, as long as one applies it in the right way (see Matthewson et al. 2007 and Matthewson 2009a, 2010a). There are three ways one could potentially challenge an evidential claim. We could challenge the evidential contribution, as in (38); this is predicted to be bad by most modal and non-modal analyses. One could challenge the plain proposition; this is predicted to be good by all analyses. But if one applies the test as in Faller’s (37), it is a valid way of detecting modal evidentials. The point of (37) is that B challenges A’s modal claim that it *must* be snowing, rather than challenging the plain proposition that it *is* snowing. Modal evidentials should be able to do this, while non-modal ones should not. Matthewson et al. (2007) show that the inferential evidential *k’a* passes challengeability:

- (39) Context: A is driving past John’s house with B and sees John’s lights are on.
 A: *wá7=k’a l=ta=tsítcw-s=a s=John; tákem*
 be=INFER in=DET=house-3POSS=EXIS NOM=John all
i=sts’ák’w-s=a wa7 s-gwel
 DET.PL=light-3POSS=EXIS IMPF STAT-burn
 ‘John must be home; all his lights are on.’

B: *aoz kw=a=s wenácw; papt wa7 lháp-en-as*
 NEG DET=IMPF=3POSS true always IMPF forget-DIR-3ERG
kw=a=s lháp-an'-as i=sts'ák'w-s=a
 DET=IMPF=3POSS put.out-DIR-3ERG DET.PL=light-his=EXIS
lh=as úts'qa7
 when=3CONJ go.out
 'That's not true. He always forgets to turn his lights off when he goes out.'

Are you saying he's definitely not home? "You just don't know. You said you're not sure because he always leaves his lights on when he leaves."

(40) shows that *lákwa* also passes challengeability: it is possible to directly challenge the modal claim that the gardener must be the thief.

(40) Context: You are a rich woman living in a mansion. You are wondering who has been stealing your jewels. It sounds like the gardener is walking around upstairs in your bedroom in his heavy boots, so that may mean he is the thief. Your husband says (a); you say (b):

a. *nilh=t'u7 lákwa ti=wa7 s-ats'x-s-táli*
 FOC=just SNV DET=IMPF STAT-see-CAUS-TOP
i=s-lep'-cál=a ku=wa7 naq'w
 DET.PL=NOM-dig-ACT=EXIS DET=IMPF steal
 'It sounds like the gardener is the thief.'

b. *áoz=ti7 kw=s=wenácw. nilh=as=há=k'a ti=wa7*
 NEG=DEM DET=NOM=true FOC=3SBJN=YNQ=INFER DET=IMPF
t'sex-en-táli ti=tsítcw=a. xmank t'it i=qwlhi7cen-s=a
 clean-DIR-TOPDET=house=EXIS heavy also DET.PL=shoe-his=EXIS
 'That's not true. The cleaner could be the thief. He also has heavy boots.'

The conclusion of this section is that despite initial appearances to the contrary, and despite non-trivial empirical differences between *lákwa* and the clearly modal evidentials in St'át'imcets, *lákwa* is a modal. I propose that the difference between modal and 'non-modal' evidentials, at least in the case of *lákwa*, is a difference between realistic and informational conversational backgrounds. For reasons of space I will not spell out the formal

analysis of *lákw7a* here, but see Matthewson (2010a) for ideas.

7. Consequences for other languages

So far, I have argued that we should not be hasty in concluding that an evidential is non-modal. The discussion of *lákw7a* has shown that even when initial evidence suggests a non-modal analysis, deeper consideration of the analytical import of the data can lead to the conclusion that an evidential is modal after all. In this section I re-examine some of the evidentials which have been claimed in the literature to be non-modal. The goal is to see whether we can extend the conclusions drawn about *lákw7a* to the stronger claim that all evidentials are epistemic modals.

7.1. Embeddability

Recall the idea behind this test: if an element can be semantically embedded under a propositional operator, it contributes to (at-issue) propositional content, and hence cannot be an illocutionary operator. However, as frequently observed in the literature, this is only a one-way test. If an element *cannot* embed, we discover nothing about its possible status as an illocutionary operator, since there may be other reasons why an element which contributes at-issue truth-conditional content is unable to embed. See Asher (2000), Faller (2002, 2006), Matthewson et al. (2007), Waldie et al. (2009), Murray (2010), a.o., for discussion. Given this, the fact that the Quechua and Cheyenne reportatives fail to semantically embed (as shown by Faller 2002, 2006, Murray 2010) does not prove that they are non-modal.

Admittedly, a uniform modal analysis needs to explain why some epistemic modals can, and some cannot, embed. See Papafragou (2006) for some relevant discussion. In some cases, there may be purely (morpho)-syntactic reasons for the failure to embed – this is the case with the conditional antecedents in Cheyenne (Murray 2010:66).

7.2. Challengeability

As discussed in section 6, challengeability is a good test for modal status, but only if it is applied to test whether a modal claim can be challenged, rather than whether the evidential contribution can. Faller applies challengeability in the way we require to the Quechua conjectural *-cha*, and

shows that *-cha* does allow assent/dissent with a modal claim, rather than only with the plain embedded proposition. This is shown in (41), from Faller (2002:181).

- (41) a. *Juan-chá vaca-ta-qa suwa-tqa-n*
 Juna-chá cow-ACC-TOP steal-PST1-3
 p = ‘Juan stole the cow.’
 MODAL VALUE: speaker considers it possible that p
 EVIDENTIAL VALUE: speaker conjectures that p
- b. *Ari. Pay-qa kan-man ka-rqa-n. Ichaqa ana-n crei-ni-chu.*
 yes he-TOP be-IRR be-PST1-3 but not-mi believe-1-NEG
 ‘Yes, he might have been the one. But I don’t believe it.’

However, when it comes to the reportative, the crucial data are missing for Quechua. Faller’s application of challengeability in this case tests only whether either the plain embedded proposition, or the evidential contribution, can be challenged. As predicted by either a modal or an illocutionary analysis, the former can (43), while the latter cannot (44):

- (42) *Ines-qa qaynunchay nana-n-ta-s watuku-sqa*
 Inés-TOP yesterday sister-3-ACC-RPT visit-PST2
 p = ‘Inés visited her sister yesterday.’
 EV = speaker was told that p
- (43) *Mana-n chiqaq-chu. manta-n-ta-ll-n watuku-rqa-n*
 not-BPG true-NEG mother-3-ACC-LIM-BPG visit-PST1-3
 ‘That’s not true. She only visited her mother.’
- (44) # *Mana-n chiqaq-chu. mana-n chay-ta willa-rqa-sunki-chu*
 not-BPG true-NEG not-BPG this-ACC tell-PST1-3S2O-NEG
 ‘That’s not true. You were not told this.’ (Faller 2002:195-196)

The same is true for Cheyenne. Murray (2010:51) applies the challengeability test in the following way:

- (45) a. *Méave’ho’eno é-hestâhe-sêstse Mókée’e*
 Lame Deer 3-be.from-RPT.3SG Mókée’e
 ‘Mókée’e is from Lame Deer, I hear.’

22 *Error! Style not defined.*

- b. *É-sáa-hetóméto-hane-Ø. É-sáa-hestâhe-he-Ø Méave'ho'eno*
 3-neg-be.true-MOD_B-DIR 3-neg-be.from-MOD_A-DIR
 'That's not true. She's not from lame deer.'
- c. # *É-sáa-hetóméto-hane-Ø. Né-sáa-nè-néstó-he-Ø*
 3-neg-be.true-mod_B-dir 3-neg-an-hear_B-MOD_A-DIR
 # 'That's not true. You didn't hear that.'

As Murray herself observes, (45) does not distinguish modal from non-modal analyses. The data we need is parallel to the English and St'át'imcets examples given in (37), (39) and (40) – data which tests whether the scope of the evidential makes a modal claim which can be directly challenged.

Based on the discussion so far, it does not look like the evidence against a modal analysis of Quechua and Cheyenne evidentials rests on very strong ground. Murray herself observes (2010:59) that

with respect to the challengeability and deniability tests, the only diagnostic which distinguishes illocutionary and epistemic evidentials is the level of commitment to the reportative's scope. In languages with illocutionary evidentials, the speaker is not committed to the truth or even the possibility of the reportative's scope. In languages with epistemic evidentials, the speaker is committed at least to the possibility of the reportative's scope.

However, we saw in section 5 that the ability of an evidential to be used when the speaker knows the scope is false is not a good diagnostic for non-modal status. This leaves us with the embedding facts, which as we saw similarly do not prove non-truth-conditional status for an evidential, plus one final test, behaviour in questions.

7.3. Evidentials in questions

Cheyenne evidentials have an interesting interpretation in questions, whereby the utterance no longer has the illocutionary force of requesting an answer. (46i) is the usual interpretation of evidentials in questions, namely one which assumes that the hearer has the relevant type of evidence. (46ii) is the interesting case.

- (46) *Tóne'se é-ho'eohtse-séstse*
 when 3-arrive-RPT.3SG
 i. 'Given what you heard, when did he arrive?'
 ii. 'He arrived sometime, I wonder when.' (Murray 2010:75)

Murray gives an illocutionary analysis of the ‘wonder’ interpretation in Cheyenne, but does not argue that the presence of this reading is a diagnostic for non-modal status. And indeed it cannot be, since the St’át’incets modal evidential *k’a* also allows this interpretation (Matthewson 2010b, Littell et al. 2010), as does the Thompson Salish conjectural (Littell et al. 2010) and the Gitksan modal inferential =*ima* (Peterson 2010). This is shown for St’át’incets *k’a* in (47).

- (47) *inwat=wít=as=k’a*
 say.what=3PL=3SBJN=INFER
 ‘I wonder what they said.’ (Matthewson 2010b:46)

Hence, whatever the correct analysis of (46-47), this is not a diagnostic for illocutionary status.

As for Quechua questions, one of Faller’s main arguments for an illocutionary analysis of evidentials relies on data such as in (48i). Under this interpretation, the speaker is reporting an earlier question uttered by somebody else. The reportative seems to be scoping over the speech-act of questioning, hence according to Faller must itself be a speech-act operator.

- (48) *Pi-ta-s* *Inés-qa* *watuku-sqa?*
 who-ACC=RPT Inés-TOP visit-PST
 ‘Who did Inés visit?’
 EV = (i) speaker indicates that somebody else is asking
 (ii) speaker expects hearer to have reportative evidence for his
 or her answer (Faller 2002:230)

At this stage I do not have a worked-out modal analysis of (48i), and as such, Faller’s argument based on such examples is the strongest potential challenge for the claim that all evidentials are modals. However, I could imagine an analysis along the following lines: (48i) is a question containing a reportative modal, roughly similar to English ‘Who must Inés have visited?’ (although note that reportative modals are rarely translated into English using overt modals). In addition, the evidential contributes the not-at-issue claim that the utterance is based on some report. The report in question is an earlier question uttered by someone else. The information that there is such a report ‘scopes out’ of the question, as all not-at-issue content is expected to do.⁸

7.4. Direct evidentials

Direct evidentials pose an obvious challenge for the idea that all evidentials are modals. If, as is commonly assumed, direct evidentials strengthen an assertion, while epistemic modals weaken it, it would seem to be impossible that a direct evidential could be a modal.

Direct evidentials – which do not exist in St'át'imcets – require further research. However, the first thing to note is that the premise – that direct evidentials strengthen the proposition, in a way which is incompatible with a modal analysis – needs further examination. Faller (2002) observes that consultants judge the Quechua 'best possible grounds' evidential *-mi* as 'more emphatic' than a plain assertion, but it is not clear how the pre-theoretical notion of emphasis relates to the strength of an assertion. Faller admits (2002:156) that

It needs to be clarified, of course, in which way an assertion with *-mi* is stronger than one without. Consultants usually are vague and say that [the *-mi* sentence] is more emphatic than [the plain proposition].

Murray (2010:22) writes that Cheyenne sentences with a direct evidential are 'stronger than unmarked sentences in English', but does not give further empirical details. In her analysis, the direct evidential is strengthened because in addition to entailing the plain proposition, it imparts that the speaker has personally witnessed the event (cf. Murray 2010:218). This type of strengthening is not necessarily incompatible with a modal analysis.

The argument that direct evidentials cannot be modals because they strengthen the proposition can be challenged from the opposite direction, too. As pointed out above and as observed by Faller (2002), it may not be correct that modals necessarily weaken a proposition. Faller proposes that the Quechua element *puni* is an epistemic modal which does not perform weakening; she compares it to English *certainly* (Faller 2002:250). If this is correct, then *puni* would differ from English *must* in that *must* does, but *puni* does not, encode an evidential contribution of indirectness (Faller 2002:249). This would enable us to maintain the claim that all evidentials are epistemic modals – but would require us to admit that not all epistemic modals are evidentials, the other half of the proposed identity relation.

Interestingly, Faller herself in very recent work (Faller 2011) offers an analysis of the Cuzco Quechua direct evidential *=mi* according to which it involves quantification over epistemically accessible worlds (but unlike most other modals, makes no reference to an ordering source). This sug-

gests that direct evidentials may not pose irredeemable problems for the proposal that all evidentials are epistemic modals.

8. Conclusion

I have not proven that all evidential are modals in this paper. I have, however, cast doubt on two of the main diagnostics for non-modal status, namely felicity if the scope of the evidential is known to be true, or known to be false. I have shown that an evidential which behaves like a non-modal on both of those core tests may nevertheless be a modal. I have also pointed out that in some cases, the relevant data is not present in the literature to prove non-modal status. At the very least, then, the current results call for caution when proposing non-modal status for an evidential.

I went further than advocating methodological caution however; I advanced the strongest possible claim, namely that the two classes of evidentials and epistemic modals are fully identical. This proposal arises out of recent developments in the literature, including especially von Stechow and Gillies (2007) and Kratzer (2010), which open up the possibility of such an equivalence. The idea is that the apparent modal/non-modal split in evidentials is actually a split between realistic and informational conversational backgrounds. Remaining issues include the special interpretation of the Quechua reportative in questions, and the status of direct evidentials. Remaining issues also include all the other languages I have failed to discuss in this paper; I hope that the current work will at least inspire people to further test the proposal.

Notes

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2. In a typical Truth Value Judgment Task, the child is asked to say whether a puppet ‘said it right’.
3. Abbreviations used in St’át’incets glosses: ACT: active intransitive, CAUS: causative, DEIC: deictic, DET: determiner, DIR: directive transitivizer, ERG: ergative, EXIS: assertion of existence, FOC: focus, IMPF: imperfective, INFER: inferential evidential, MID: middle intransitive, NEG: negative, NOM: nominalizer, OBJ: object, PL: plural, POSS: possessive, RPT: reportative, SG: singular, SNV: sensory non-visual, STAT: stative, SUBJ: subject, TOP: non-topical subject. The symbol - marks an affix boundary and = marks a clitic boundary.
4. While there are other modality tests in the literature (some of which I discuss in section 6), the two discussed in this section are the easiest to apply, and give the clearest non-modal-like results for *lákwa7a*.
5. The modal inferential evidential *k’a* behaves exactly like *must* here; it is felicitous in a case paralleling the case of Chris’s lost ball.
6. Further research is required. Preliminary results on the interaction between *lákwa7a* and negation suggest that *lákwa7a* may be similar to the Japanese evidentials (McCready and Ogata 2007:170-171) in allowing the evidential contribution to scope under negation. This is shown in (i).
 - (i) Context: Someone was prowling around your house. Your friend who you’re telling thinks you just heard a noise and tells you it could have been just the wind. You say:

cw7aoz kw=s=wa7 lákwa7a ku=mám’teq láku7 ált’sq7=a,
 NEG DET=NOM=IMPF SNV DET=walk DEIC outside=EXIS
áts’x-en=lhkan
 see-DIR=1SG.SUBJ
 ‘I didn’t just hear it, I saw him.’
7. McCready and Ogata’s (2007) analysis is different; recall that with the Japanese evidentials, even the evidential contribution can embed. Consequently, they analyse the evidential contribution as ordinary propositional content.
8. One potential issue with this idea is Faller’s claim (2002:233) that in cases like (48i), the speaker is not themselves performing a questioning speech-act. Faller observes that if the earlier questioner is in the room at the time of utterance, the hearer can respond not to the current speaker, but to the earlier one.

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