Modality in St'át'imcets*

Lisa Matthewson, Hotze Rullmann, and Henry Davis
University of British Columbia

This paper argues that in St'át'imcets (Lillooet Salish), modal notions are expressed via elements which have no inherent quantificational force (and thus allow both necessity and possibility interpretations), but which explicitly delimit the modal base. We focus on four modal elements in St'át'imcets: the three second position enclitics *k'a*, *kelh*, and *ka*, which receive epistemic, future, and either deontic or irrealis readings, respectively; and the 'out-of-control' affix combination *ka-...-a*, which has a circumstantial reading. We provide a formal semantic analysis of these items, and conclude with some remarks about the broader typological differences in the way in which languages organize their modal systems.

1 Introduction

It is generally assumed that modals introduce quantification over possible worlds. For example, English *must* is a universal quantifier over worlds, while *may* is an existential quantifier. Modals also involve implicit conversational backgrounds, which vary depending on context (Kratzer 1977, 1981, 1991). For example, *must* (along with many other modals) allows both epistemic and deontic readings, as shown in (1-2).

(1) Michl must be the murderer. (In view of what is known about the crime.)
EPISTEMIC (Kratzer 1991:643)

(2) Jockl must go to jail. (In view of what the law provides.)
DEONTIC (Kratzer 1991:640)

Kratzer argues that the conversational background consists of two components, the modal base and the ordering source. In (1), *must* quantifies over worlds which are compatible with what is known about the crime (an epistemic modal base). The worlds quantified over are further restricted to those which are closest to the evaluation world in terms of 'the normal course of events' (a stereotypical ordering source). Thus, it is not required that in unusual worlds where aliens murder humans, Michl is the murderer. In (2), *must* quantifies over worlds

* We are very grateful to St'át'imcets consultants Beverley Frank, Laura Thevarge, Gertrude Ned and Rose Agnes Whitley. We are also very grateful to Ana Arregui, Angelika Kratzer, Jean-Pierre Koenig and the audience at SULA 3 for helpful discussion. Errors are our own. This research has been supported by SSHRC grants #410-2002-1715, #410-2003-1138 and #410-2005-0875.

which are compatible with a certain set of facts in the evaluation world (a circumstantial modal base), and which are closest to the ideal given by 'what the law provides' (a normative ordering source).

While modals in English specify (only) a quantificational force in their lexical entry, and leave the conversational background to be filled in by context, Chung and Timberlake (1985:242) suggest that 'if we exclude modal auxiliaries, particular languages tend to be less concerned with distinguishing necessity from possibility than with distinguishing different types of possibility.' In the next section we will show that this claim is supported by data from St'át'imcets (Lillooet Salish). In St'át'imcets, modals do not in general encode a specific quantificational force. Instead, they encode restrictions on the conversational background as a lexical property.

2 Four St'át'imcets Modals

In St'át'imcets, unlike in English, elements involving quantification over worlds require a particular type of conversational background, while leaving the quantificational force unspecified. In this paper, we focus on the four elements listed in (3).

(3)	a.	*k'a*	epistemic
	b.	*kelh*	future
	c.	*ka*	deontic or irrealis
	d.	*ka-...-a*	purely circumstantial

The items in (3a-c) are second-position clitics; the morpheme in (3d) *ka-...-á* (henceforth abbreviated as *ka-a*) is a circumfix which attaches directly to the verb. In the following sub-sections we present descriptive generalizations and supporting data for each of these morphemes.

We refer to all four of these elements as modals, to emphasize the fact that, just like English modals, they involve quantification over possible worlds.[1] However, in employing this term we do not mean to obscure the important semantic and syntactic differences between St'át'imcets modal elements and the modal auxiliaries of English. On the contrary, the main purpose of this paper is precisely to draw attention to these differences and to provide an analysis for them.

2.1 Epistemic *k'a*

Epistemic *k'a* is is one of a set of four evidential enclitics in the language (Davis, *in prep.*).[2] Examples are given in (4); these sentences have

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[1] An alternative would have been to call these elements moods, to highlight the similarity between our treatment of these elements and the analysis of mood in Portner (1997). However, that terminological choice could be confusing, since St'át'imcets also has what is traditionally treated as a subjunctive mood (see van Eijk 1997, Davis *in prep.*). We leave the analysis of the subjunctive in St'át'imcets for another occasion.

[2] See van Eijk (1997), Davis (*in prep.*) for discussion of the distinctions between

only epistemic readings. While the conversational background is clearly lexically delimited, the quantificational force is not. The translations provided by consultants, as well as the range of acceptable utterance contexts, make clear that *k'a* need not be universal (like English *must*) but can also have existential force (like English *may* or *might*).

(4) a. t'ak **k'a** tu7 kents7á ku míxalh
go.along **EVID** then DEICTIC DET bear
'A bear must have gone by around here.' (Davis in prep.)

b. nilh **k'a** kw s-Henry wa7 pegwpegwtsám'
FOC **EVID** DET NOM-Henry IMPF knock
'That'll be Henry knocking.'

c. Context: You have a headache that won't go away, so you go to the doctor. All the tests show negative. There is nothing wrong, so it must just be tension.
nilh **k'a** lh(l)-(t)-en-s-wá(7)-(a)
FOC **EVID** PREP-DET-1SG.POSS-NOM-IMPF-DET
ptinus-em-sút
think-INTR-OOC
'It must be from my worrying.'

d. wa7 **k'a** séna7 qwenúxw
IMPF **EVID** COUNTER sick
'He may be sick.' (Context: Maybe that's why he's not here.)

e. Context: His car isn't there.
plan **k'a** qwatsáts
already **EVID** leave
'Maybe he's already gone.'

2.2 Future *kelh*

The future in English and other languages is often assumed to involve quantification over worlds (see Enç 1996, Copley 2002, Condoravdi 2001, among many others). English *will,* for example, is a universal quantifier over worlds, which—just like other modal auxiliaries—allows different conversational backgrounds.[3] *Will* even allows non-future modal readings, as in the so-called 'dispositional *will'*, illustrated in (5a), or the epistemic *will* in (5b):

(5) a. Mary will eat beans these days. (Copley 2002:109)
b. John'll be at home now

In contrast to *will*, the St'át'imcets modal enclitic *kelh* always enforces a future interpretation. Examples are given in (6).

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different evidential clitics in St'át'imcets with respect to the type of evidence which is required.

[3] Copley (2002) argues that futures involve totally realistic circumstantial modal bases (which she calls metaphysical modal bases), with the ordering source being either bouletic or inertial. See also section 4.

(6) a. táyt-kan **kelh**
hungry-1SG.SUBJ **FUT**
'* I was hungry / * I am hungry / I will be hungry.'

b. k'ac-an'-lhkán **kelh**
dry-DIR-1SG.SUBJ **FUT**
'* I dried it / * I am drying it / I will dry it.'

c. sáy'sez'-lhkán **kelh**
play-1SG.SUBJ **FUT**
'* I played / * I am playing / I will play.'

d. t'íq-kan **kelh**
arrive-1SG.SUBJ **FUT**
'* I arrived / * I am arriving / I will arrive.'

Kelh differs from English *will* in two important respects.[4] The first is in terms of its quantificational force. Sentences containing *kelh* allow translations into English involving existential *might* as well as universal *will.* This suggests that like the epistemic modal *k'a, kelh* allows variable quantificational force:

(7) a. ka-kwís-a **kelh** ti k'ét'h-a
OOC -fall-OOC **FUT** DET rock-DET
'That stone might drop.'

b. ts7as **kelh** ku zús-cal
come **FUT** DET catch-ACT
'A policeman might come.'

Kelh also differs from *will* in that it does not allow dispositional or other non-future readings. It is thus more restricted than *will* in terms of the conversational backgrounds it allows. This is illustrated in (8); (8a) and (8b) are a minimal pair, with only (8b) containing *kelh.*

(8) a. wa7 álk'wilh lh-núkw-as s-Sarah
IMPF babysit HYP-other-3CONJ NOM-Sarah
lh-as tsicw ts'úqwaz'-am i núkw-a
HYP-3CONJ get.there fish-MID DET.PL other-DET
'Sarah will sometimes babysit when everyone else goes fishing.'
(St'át'imcets volunteered) (Matthewson 2004)

b. # wa7 **kelh** álk'wilh lh-núkw-as s-Sarah
IMPF **FUT**babysit HYP-other-3CONJ NOM-Sarah
lh-as tsicw ts'úqwaz'-am i núkw-a
HYP-3CONJ get.there fish-MID DET.PL other-DET
Consultant's comment: "That *kelh* is she WILL. But you said it was sometimes." (Matthewson 2004)

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[4] Matthewson (2004) argues that *kelh* corresponds to WOLL, the temporal or modal component that combines with either present or past tense to give *will* and *would* respectively (see Abusch 1985). Since the *will/would* alternation is not relevant here, we talk about *will* rather than WOLL.

The existential uses of *kelh* also necessarily involve future events; they lack the epistemic reading which is available for English *might.* In (9), for example, the epistemic possibility reading is rendered with the evidential enclitic *an'*, and the use of *kelh* converts the meaning to a future-time eventuality.

(9) Situation: You are driving past your friend's house and you notice her son's car in the driveway and you say 'Jimmy might be back.'

a. t'íq-as-**an'** p'an't kw s-Jimmy[5]
arrive-3CONJ-**EVID** return DET NOM-Jimmy
'It looks like Jimmy is back.' (volunteered form)

b. t'íq-as **kelh** p'an't kw s-Jimmy
arrive-3CONJ **FUT** return DET NOM-Jimmy
'Jimmy might come back.'

Consultant's comment for (b): "You are hoping that he will come back."
(Matthewson 2004)

We have seen in this sub-section that *kelh* allows variable quantificational force, and that it only allows conversational backgrounds which give rise to future readings.

2.3 Deontic / irrealis *ka*

The second-position clitic *ka* has two uses. First, it is the primary means in the language of expressing deontic readings. (*Ka* is glossed as 'obligation / expectancy' by van Eijk 1997). As shown in (10), the quantificational force is not lexically specified: both universal deontic (*must/have to/should*) and existential deontic (*may/can*) readings are possible.

(10) a. cuy'-lhkacw **ká** t'u7 nas áts'x-en (ta)
going.to-2SG.SUBJ **DEON** PART go see-TR (DET)
kwtámts-sw-a
husband-2SG.POSS-DET
'You must go to see your husband.'

b. wa7 **ka** s-lep' i k'ún7-a ku
IMPF **DEON** STAT-bury DET.PL fish.egg-DET DET
pála7 máqa7
one snow
'The eggs have to stay in the ground for a year.'

c. kan **ka** kw-en-s ulhcw
YNQ **DEON** DET-1SG.POSS-NOM enter
'Should / can / may I come in?'

[5] Note that *an'* automatically triggers subjunctive (or 'conjunctive') subject morphology on the predicate to which it attaches. See also footnote 6.

d. qwatsáts-kacw **ka**
leave-2SG.SUBJ **DEON**
'(Maybe) you should leave.'

e. lán-lhkacw **ka** áts'x-en ti
already-2SG.SUBJ**DEON** see-TR DET
kwtámts-sw-a
husband-2SG.POSS-DET
'You must / can / may see your husband now.'

The examples in (11) show *ka* being used in a range of constructions which share an irrealis semantics (to be made more precise below; this correlates with Davis (*in prep.*)'s use of the term 'irrealis' for *ka*). These include counterfactual conditionals (a-d), non-counterfactual conditionals (e-g), and counterfactual wishes (h-i).

(11) a. t'cum **ka** ku cw7it sqlaw', t'u7 pel'p-s-ás
win **IRR** DET many money but lose-CAUS-3ERG
ta ticket-s-a
DET ticket-3POSS-DET
'He could have won a lot of money, but he lost his lottery ticket.'

b. zúqw-s-as **ka** ta sk'úk'wmi7t-a ti7 ku swúw'a,
die-CAUS-3ERG **IRR** DET child-DET DEMON DET cougar
lh-cw7áoz-as kw s-qus-cit-ítas
HYP-NEG-3CONJ DET NOM-shoot-APPL-3PL.ERG
'That cougar could have killed a child if they hadn't shot it.'

c. kukwpi7-lhkán **ka** tu7 séna7,
chief-1SG.SUBJ **IRR** then COUNTR
t'u7 cw7aoz k-wa7 áw-an-ts-as
but NEG DET-IMPF choose-TR-1SG.OBJ-3ERG
'I could have been a chief, but no-one voted for me.'

d. nas-kan **ká** tu7 záw-em, t'u7 qácwecw ta
go-1SG.SUBJ **IRR** then fish-INTR but break DET
káoh-s-a ta smulháts-a n-skúza7
car-3POSS-DET DET female-DET 1SG.POSS-offspring
'I would have gone fishing, but my daughter's car broke down.'

e. zikt **ka** láti7 ku srap, lh-gelgel-ás ta
fall **IRR** DEIC DET tree HYP-strong-3CONJ DET
sk'éxem-a
wind-DET
'That tree would fall, if the wind got strong.'

f. weq'w **ka** láti7 ku stlháyen,
swept.away **IRR** DEIC DET gillnet
lh-t'ák'-as ta qú7-a
HYP-flood-3CONJ DET water-DET
'That gillnet would float away if the water rises.'

g. lh-kwán-acw i meláomen-sw-a,
HYP-take(DIR)-2SG.CONJ DET.PL medicine-2SG.POSS-DET
lháxw-kacw **ka**
heal-2SG.SUBJ **IRR**
'If you took your medicine, you might get better.'

h. ama **ká** t'u7 lh-wá7-as máwal' k Jack
good **IRR** just HYP-IMPF-3CONJ alive DET Jack
'If only Jack were still alive!'
(Literally: 'It would be good if Jack were still alive.')

i. qwatsáts-as[6] **ka** ti sqáycw-a
leave-3CONJ **IRR** DET man-DET
'I wish the man would leave.'

In its irrealis uses, *ka* requires that the proposition it operates on is false. Examples (12) and (13) show that the falsity cannot be canceled, which suggests it is more than a mere implicature, as has been claimed for English. (Below, we model it as a presupposition.)

(12) Story: Mary went to bingo. She could have won a lot of money (because the prizes were big). And in fact she DID win a lot of money!
Second sentence cannot be rendered as:
t'cum **ka** ku cw7it sqlaw'
win **IRR** DET many money
'She could have won a lot of money.'
Consultant's comment: "No. That's presuming she could have, but she DIDN'T win."

(13) Story: There were lots of children out for a walk near the cougar's den. That cougar could have killed a child. And in fact, it DID kill a child!
Second sentence cannot be rendered as:
zúqw-s-as **ka** a sk'úk'wmi7t-a ti7 ku
die-CAUS-3ERG **IRR** DET child-DET DEMON DET
swúw'a
cougar
'That cougar could have killed a child.'
Consultant's comment (after several examples were tried, getting frustrated): "Either you do or you don't, as far as I'm concerned!"

The deontic and the irrealis readings are the only possibilities for *ka*. For example, *ka* never has epistemic readings. As noted above, these require evidential markers.

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[6] Besides *ka*, (11i) contains subjunctive subject marking (glossed 'CONJ' for 'conjunctive', following common Salishanist terminology). In this example, subjunctive marking alters the meaning; without it, (11i) would be translated as 'The man should leave'. As mentioned in footnotes 1 and 5, the analysis of St'át'imcets subjunctive marking is a matter for future research. Note that the occurrences of subjunctive morphology in (11e-h) are obligatorily triggered by the hypothetical complementizer *lh-*.

(14) nilh **k'a / *ka** kw s-Mary ku kuk-un'-táli
FOC **EVID / *KA** DETNOM-Mary DET cook-TRANS-TOP
'Mary could have cooked this.' (It tastes like her cooking.)

2.4 Circumstantial *ka-a*

Purely circumstantial conversational backgrounds are concerned with what is possible/necessary given certain facts about the way the world is. Kratzer's (1991) example illustrating this involves (15a) vs. (15b), as explained in the quote below the examples:

(15) a. Hydrangeas can grow here. CIRCUMSTANTIAL
b. There might be hydrangeas growing here. EPISTEMIC

> Suppose I acquire a piece of land in a far away country and discover that soil and climate are very much like at home, where hydrangeas prosper everywhere. Since hydrangeas are my favorite plants, I wonder whether they would grow in this place and inquire about it. The answer is [15a]. In such a situation, the proposition expressed by [15a] is true. It is true regardless of whether it is or isn't likely that there are already hydrangeas in the country we are considering. All that matters is climate, soil, the special properties of hydrangeas, and the like. Suppose now that the country we are in has never had any contacts whatsoever with Asia or America, and the vegetation is altogether different from ours. Given this evidence, my utterance of [15b] would express a false proposition. What counts here is the complete evidence available. And this evidence is not compatible with the existence of hydrangeas.
> [15a] together with our scenario illustrates the pure circumstantial reading of the modal can ... [15b] together with our scenario illustrates the epistemic reading of modals ... circumstantial and epistemic conversational backgrounds involve different kinds of facts. In using an epistemic modal, we are interested in what else may or must be the case in our world given all the evidence available. Using a circumstantial modal, we are interested in the necessities implied by or the possibilities opened up by certain sorts of facts.
>
> (Kratzer 1991:646)

None of the St'át'imcets modals discussed so far allow purely circumstantial readings. However, circumstantial readings may be expressed using the so-called 'out-of-control' circumfix *ka-a*, as in (16).

(16) a. wa7 **ka**-ríp-**a** ku káwkew kents7á
IMPERF **OOC**-grow-**OOC** DETsagebrush DEICTIC
'Sagebrush can grow around here.'
(Okay if speaker knows no sagebrush actually grows here.)
Consultant's comment: "If somebody brought some seeds it would grow here – it's just a possibility it would grow here."[7]

b. wá7-lhkan **ka**-cát-s-**a** ta k'ét'h-a
IMPF-1SG.SUBJ **OOC**-lift-CAUS-**OOC** DETrock-DET
'I can lift the rock.'

It is tempting, both on semantic and purely formal grounds, to analyze *ka-a* as a modal whose conversational background is specified to be circumstantial (parallel to the epistemic, future, and deontic/irrealis cases discussed so far). We will in fact adopt that analysis here. However, there are at least three ways in which *ka-a* differs from the other modal elements we have examined so far, and which will have to be addressed more thoroughly in future research.

First, *ka-a* differs morpho-syntactically from the other three modals. While *k'a, kelh* and *ka* are all second-position clitics with clausal scope, *ka-a* is a circumfix on the predicate, whose scope excludes the subject.

Second, *ka-a* has two other readings which are not obviously modal (although they may be eventually be analysable as such). Examples are given in (17); these are characterized in the literature as the 'suddenly' and 'accidentally' readings (see van Eijk 1997, Demirdache 1997, Davis *in prep.*).[8]

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[7] The epistemic reading of Kratzer's 'hydrangea sentences' usually takes the evidential k'a:

(i) Context: Not only are the climate and soil right, but you have reason to believe that it's actually possible there is some sagebrush.
wa7 **k'a** kents7á sxek ku káwkew
be **EVID** DEICTIC maybe DET sagebrush
'Sagebrush might be growing around here.'

(11a) is possible in the (i) situation, but (i) is not possible in the (11a) situation. This does not mean that ka-a has an epistemic reading, but rather that if it is epistemically possible that sagebrush grows, it is also circumstantially possible, but not necessarily vice versa.

[8] Which reading obtains partially depends on the aspectual class of the predicate; see Demirdache (1997), Davis (*in prep.*). *ka-a* also has a 'managed to' reading, as in (i).

(i) wát'k'-kan i-sít.st-as, t'u7
vomit-1SG.SUBJ when(PAST)-night-3CONJ but
ka-ilhen-lhkán-**a** i-nán'atcw-as
OOC-eat-1SG.SUBJ-**OOC** when(PAST)-night-3CONJ
'I threw up last night, but I managed to eat this morning.'

However, Davis (*in prep.*) provides evidence that the 'managed to' reading is reducible to the circumstantial reading. Like the circumstantial reading, but unlike English *managed to,* the St'át'imcets so-called 'managed to' reading does not entail that the event happened. It is thus parallel to English *was able to.*

(17) a. **ka**-lhexw-min-ts-ás-**a** ta xzúm'-q-a
OOC-appear-APPL-1SG.OBJ-3ERG-**OOC** DETbig-animal-DET
dog
sqáxa7
'A big dog came up to me all of a sudden.'
b. **ka**-nik'aká7-lhkan-**a**
OOC-cut-hand-1SG.SUBJ-**OOC**
'I got cut on the hand (by accident).'

Recently, Copley (2005) has provided a modal analysis of an O'odham morpheme, *cem,* which has a strikingly similar range of readings to *ka-a. Cem* differs from *ka-a* in not having a 'suddenly' reading, however.[9] For the purposes of this paper, we set aside the 'suddenly' and 'accidentally' readings of *ka-a* and concentrate on the circumstantial reading illustrated in (16).

The third way in which *ka-a* differs from the other three modals in St'át'imcets is that it does not allow universal quantificational force. Kratzer's (1991) example of a universal circumstantial reading is *Jockl must sneeze* (in view of the present state of his nose, etc.). St'át'imcets speakers give plain future translations of such examples, as illustrated in (18).

(18) Context:
qv̓l ta s7exw7únam-s-a s-Gertie
bad DETcold-3POSS-DET NOM-Gertie
'Gertie has a bad cold.'
stexw wa7 ntéqpeqs
very IMPERF stuffed.up
'Her nose is really plugged up.'
a. **ka**-nsnán7-**a**
OOC-sneeze-**OOC**
= 'She can sneeze.'
≠ 'She must sneeze.'
b. # nsnána7 **ka**
sneeze **DEON**
'She must sneeze.'

Consultants corrected (18b) to (19):

(19) **cuz'** nsnána7 kw s-Gertie
going.to sneeze DETNOM-Gertie
'Gertie is gonna sneeze.'
Consultant 1's comment: "She is definitely going to sneeze. I can see her."
Consultant 2's comment: "That's the only way [to say it]."

[9] Though even more interestingly, the 'limited control' morphemes of Central Salish languages (e.g., Northern Straits, Halkomelem, and Squamish) also lack the 'suddenly' reading, and thus precisely parallel *cem* in O'odham.

We could simply assume that circumstantial *ka-a* is lexically restricted to a possibility reading (much like English *be able to).* This may be related to the morpho-syntactic difference between *ka-a* and the other modals; notice that the English suffix *–able* also has only existential force.

On the other hand, it may be possible for us to derive the absence of the universal circumstantial reading for *ka-a* without having to state anything in the lexicon, by exploiting the fact that with eventive predicates, the universal circumstantial reading is very close to the meaning one obtains with a future. Thus if Jockl must sneeze, in view of the present state of his nose, etc., then surely he will sneeze.

2.5 Universal quantification as a default

Portner (1997:207) claims that 'the default modal force is necessity', and this is supported by the St'át'imcets data. For example, for deontic readings, speakers consistently volunteer *ka* when translating English sentences containing *must* or *should* (see, e.g. (10a,b) above), but do not usually volunteer *ka* as a translation of English *may* or *can.* However, speakers always accept *ka* for existential deontic meanings. This situation supports the claim that the universal reading is a default; similar facts hold also for the irrealis reading of *ka,* and for epistemic *k'a.* As for circumstantial *ka-a,* it appears to differ from the other modals in having a lexically specified quantificational force (existential). Future research may establish some reason why the universal reading is disallowed for *ka-a,* allowing us eventually to claim that no modals in St'át'imcets involve lexically-given quantifiers.

3 Comparing the St'át'imcets and English Modal Systems

We have seen so far that whereas English modals have a fixed quantificational force but can typically take various kinds of conversational backgrounds, St'át'imcets modals typically vary in their quantificational force, but are constant in the type of conversational background they take. This difference can be illustrated with the following tables, which present a simplified and schematic summary of the organization of the modal systems of the two languages:

Table 1: The modal system of English

	epistemic	**deontic**	**circumstantial**	**future**
strong	*must*	*must*	*must*	*will*
weak	*can*	*can*	*can*	*might*

Table 2: The modal system of St'át'imcets

	epistemic	**deontic/irrealis**	**circumstantial**	**future**
strong	*k'a*	*ka*	--	*kelh*
weak	*k'a*	*ka*	*ka-a*	*kelh*

As these tables illustrate, the English modal system is organized "horizontally" (fixed quantificational force, varying conversational background), whereas the

St'át'imcets system is organized "vertically" (fixed conversational background, varying modal force). Of course, the modal systems of both languages are actually quite a bit more complex than these tables suggest. Not only do more fine-grained distinctions have to be recognized in both the types of conversational backgrounds and in degrees of quantificational force (see for instance Kratzer 1981, 1991 for extensive discussion and exemplification), but there are also in both languages many seemingly idiosyncratic restrictions and exceptions on the meaning and use of individual modals (for instance, in English *be able to* can only be circumstantial). But the difference in the overall organization of the two systems is quite striking and, we argue, fundamental.

This contrast between English and St'át'imcets modals is reminiscent of the difference between modals and (notional) moods according to Portner (1997): unlike modals, mood markers do not have quantificational force of their own; their main function is to add a presupposition about the type of conversational background that is involved in the modal interpretation of the sentence. In what follows, we give a semantics of the St'át'imcets modals in the spirit of Portner's presuppositional analysis of notional mood.[10]

4 Semantics of St'át'imcets Modals

We argue that St'át'imcets modals typically impose a particular presupposition on their conversational background. They have a quantificational force as well, but it is dependent on the particular context (except in the case of *ka-a* which can only have existential force). Following Portner (1997), we treat the conversational background as a parameter of interpretation, which we will indicate by means of the superscript c. In addition, we assume the usual parameters of possible world (w) and time (t). The denotation of a clause ϕ is thus defined relative to at least these three parameters: $[[\phi]]^{w,t,c}$. The conversational background c in turn consists of two components: the modal base B(c) and the ordering source O(c) (Kratzer 1981, 1991). However, in order to keep things simple, we will in the definitions that follow ignore the role played by the ordering source.[11]

We now give a (preliminary) semantics for the four St'át'imcets modals discussed in this paper. Let's start with the epistemic second-position clitic *k'a*:

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[10] Portner's concept of notional mood covers a range of morpho-syntactically very diverse phenomena including the Italian subjunctive, the English mandative and counterfactual subjunctives, mood-indicating *may, for*-infinitivals, etc.

[11] The ordering source induces a partial ordering on the worlds in the modal base. Its function in the semantics of modals is to restrict the quantification to those worlds in the modal base that "come closest to the ideal established by the ordering source" (Kratzer 1991: 644). However, implementing this formally leads to considerable complications which we want to avoid here. However if we were to implement the ordering source in our formal definitions, we could make use of the gradations of modal force defined by Kratzer (such as necessity, good possibility, possibility, weak necessity and slight possibility) to model the variability in the quantificational force of the modal.

(20) **Semantics of *k'a* (epistemic)**
$[[k'a\ \phi]]^{w,t,c}$ is only defined if B(c) is epistemic.
If defined, $[[k'a\ \phi]]^{w,t,c} = 1$ iff for all/some worlds $w' \in B(c)(w,t)$, $[[\phi]]^{w',t,c} = 1$

This definition incorporates the two central claims made in this paper: like all St'át'imcets modals, *ka'a* requires a particular kind of modal base (epistemic), whereas its quantificational force varies. This variability is captured in (20) by means of the phrase "for some/all worlds w". By this we do not intend to say that the modal is ambiguous between a universal and an existential reading. What we do mean is that its quantificational force is vague or underspecified, with universal and existential force as the two opposite ends of the spectrum. Exactly how this vagueness or underspecification gets resolved in a particular utterance context is an important empirical and theoretical question which we have to leave for further research. The modal base B(c) is a function from world-time pairs to sets of possible worlds.[12] Since B(c) is epistemic, B(c)(w,t) is the set of worlds that are in accordance with the "available evidence" in w at t.

The semantics of future *kelh* is a bit more complicated than that of *k'a* because it involves reference to future times, i.e. times that follow the evaluation time. *Kelh* also requires a different type of conversational background than *k'a*. We will assume that the conversational background required by *kelh* is circumstantial in the sense of Kratzer (1981, 1991) ("in view of the relevant circumstances"); see also Copley (2002).

(21) **Semantics of *kelh* (future)**
$[[kelh\ \phi]]^{w,t,c}$ is only defined if B(c) is circumstantial.
If defined, $[[kelh\ \phi]]^{w,t,c} = 1$ iff for all/some worlds $w' \in B(c)(w,t)$, there is a time $t' > t$ such that $[[\phi]]^{w',t',c} = 1$

The variable quantificational force allows for both 'will' and 'might' interpretations of *kelh*. Circumstantial modal bases are "realistic" which means that $w \in B(c)(w,t)$ for all worlds w and times t. Therefore, if *kelh* has universal force (like English *will*), the proposition *kelh* ϕ entails that ϕ is true at a future time in the actual world. The result is a meaning for *kelh* which is very close to the purely temporal and non-modal semantics for *kelh* given in Matthewson (2004). However, if the quantificational force is existential ('might'), *kelh* ϕ is true iff ϕ is true at some future time in at least one of the worlds in which the relevant circumstances hold. This does not need to be the actual world. A non-modal analysis of the 'might' reading of *kelh* is obviously not possible. Our analysis thus provides a unified account of the apparent ambiguity of *kelh* between a purely temporal interpretation ('will') and a modal interpretation ('might').

The circumfix *ka-a* requires a circumstantial modal base and can only have existential force.

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[12] This is another simplification. Kratzer argues that the modal base (as well as the ordering source) maps onto a set of propositions rather than worlds.

(22) **Semantics of *ka-a* (circumstantial)**
$[[ka\text{-}a\ \phi]]^{w,t,c}$ is only defined if B(c) is circumstantial.
If defined, $[[ka\text{-}a\ \phi]]^{w,t,c} = 1$ iff for some world $w' \in B(c)(w,t)$, $[[\phi]]^{w',t,c} = 1$

This definition ignores the "out-of-control" uses of this morpheme discussed in section 3 (the 'suddenly' and 'accidentally' interpretations). Ideally, a unified analysis should be given, but we leave this as an issue for future research.

Finally, let's turn to *ka*. In section 2.3 we distinguished two readings for *ka*, namely deontic and irrealis (the latter including counterfactual). For the moment, we will treat these as completely separate from each other (ka_1 and ka_2), but at the end of this section we will briefly consider the possibility of a unification. The entry for ka_1 (deontic) is straightforward:

(23) **Semantics of ka_1 (deontic)**
$[[ka_1\ \phi]]^{w,t,c}$ is only defined if c is deontic.[13]
If defined, $[[ka_1\ \phi]]^{w,t,c} = 1$ iff for all/some worlds $w' \in B(c)(w,t)$, $[[\phi]]^{w',t,c} = 1$

The presupposition of irrealis ka_2 is of a somewhat different nature than that of the St'át'imcets modals we have discussed so far. We argue that ka_2 presupposes that the proposition expressed by the clause it modifies must be false. This means that we take Davis' (*in prep.*) descriptive characterization of *ka* as an irrealis marker quite literally. (24) is a first attempt at characterizing the presupposition of ka_2, which will be revised shortly.

(24) **Presupposition of ka_2 (irrealis) [preliminary formulation]**
$[[ka_2\ \phi]]^{w,t,c}$ is only defined if $[[\phi]]^{w,t,c} = 0$.

Note that (24) only specifies the presupposition of ka_2 and does not say anything about its assertion. There is a voluminous literature on the semantics of conditionals (counterfactual or non-counterfactual), which we can't even begin to address in this paper. We leave it up to the reader to fill in her favorite semantics for conditionals.

The presupposition in (24) will work for past counterfactuals such as (11a-d). These examples are repeated here as (25a-d):

[13] According to Kratzer, a deontic conversational background consists of a circumstantial modal base and a normative ordering source.

(25) a. t'cum **ka** ku cw7it sqlaw', t'u7 pel'p-s-ás
win **IRR** DET many money but lose-CAUS-3ERG
ta ticket-s-a
DET ticket-3POSS-DET
'He could have won a lot of money, but he lost his lottery ticket.'

b. zúqw-s-as **ka** ta sk'úk'wmi7t-a ti7 ku swúw'a,
die-CAUS-3ERG **IRR** DET child-DET DEMON DET cougar
lh-cw7áoz-as kw s-qus-cit-ítas
HYP-NEG-3CONJ DET NOM-shoot-APPL-3PL.ERG
'That cougar could have killed a child if they hadn't shot it.'

c. kukwpi7-lhkán **ka** tu7 séna7,
chief-1SG.SUBJ **IRR** then COUNTR
t'u7 cw7aoz k-wa7 áw-an-ts-as
but NEG DET-IMPF choose-TR-1SG.OBJ-3ERG
'I could have been a chief, but no-one voted for me.'

d. nas-kan **ká** tu7 záw-em, t'u7 qácwecw ta
go-1SG.SUBJ **IRR** then fish-INTR but break DET
káoh-s-a ta smulháts-a n-skúza7
car-3POSS-DET DET female-DET 1SG.POSS-offspring
'I would have gone fishing, but my daughter's car broke down.'

Consider (25b), for instance. It presupposes that in the actual world w it is false at the speech time t that the cougar killed a child. Worlds in which the cougar killed a child are therefore no longer accessible at t, although they were at an earlier point in time before the cougar got shot. Note that although there is no overt tense marking in (25b), we assume that ϕ contains a past reference time. St'át'imcets does not have real past tense marking. The optional clitic *tu7*, which appears in (25c) and (d), is sometimes taken to be a past tense marker, but Davis and Matthewson (2003) and Matthewson (2004) have shown that it is better analyzed as a temporal distal demonstrative (which is why it is glossed as 'then').[14]

However, as it is, (24) is not adequate for non-counterfactual conditionals that are about future events such as (11e-g), repeated here as (26a-c).

(26) a. zikt **ka** láti7 ku srap, lh-gelgel-ás ta
fall **IRR** DEIC DET tree HYP-strong-3CONJ DET
sk'éxem-a
wind-DET
'That tree would fall, if the wind got strong.'

b. weq'w **ka** láti7 ku stlháyen,
swept.away **IRR** DEIC DET gillnet
lh-t'ák'-as ta qú7-a
HYP-flood-3CONJ DET water-DET
'That gillnet would float away if the water rises.'

[14] See Iatridou (2000) and Ippolito (2003) for recent discussions of tense in counterfactual conditionals.

c. lh-kwán-acw i meláomen-sw-a,
HYP-take(DIR)-2SG.CONJ DET.PL medicine-2SG.POSS-DET
lháxw-kacw **ka**
heal-2SG.SUBJ **IRR**
'If you took your medicine, you might get better.'

(26a) clearly does not presuppose that the tree won't fall. In fact, the sentence asserts that the tree will fall given the right circumstances (if the wind gets strong). However, it still has an irrealis flavour in the sense that the default assumption is that the tree will not fall. These examples are analogous to what Iatridou (2000) has called "future less vivid" conditionals in English, which involve the use of a present subjunctive (or "fake past tense") in the antecedent and the presence of the modal *would* in the consequent, as in (27a):

(27) a. If he took his medicine, he would get better.
b. If he had taken his medicine, he would have gotten better.
c. If he takes his medicine, he will get better.

(27a) differs crucially from past counterfactual conditionals such as (27b), in that worlds in which the antecedent becomes true are still considered accessible at the speech time in the former but not in the latter. At the same time, in conditionals like (26a-c) or (27a) the antecedent becoming true is a more remote possibility than in the corresponding indicative conditionals such as (27c) (Iatridou's "future neutral vivid" conditionals).

To deal with conditionals about the future like (26a-c) we need to modify the semantics of the irrealis marker ka_2 by modalizing its presupposition. Basically, what we want to say in the case of (26c), for instance, is that in the 'normal' course of events, the tree is expected not to fall. Borrowing a term from Kratzer (1981, 1991), we assume that the normal course of events involves a stereotypical modal base, by which we mean a modal base which includes only worlds that up to the speech time t have the same history as the actual world w, and that after t develop in accordance with normal expectations. (This is similar in spirit to the inertia worlds of Dowty 1979 and Copley 2002; see also Gamut 1991 for some discussion of the branching world structure we assume here.) We propose the following revised formulation of the presupposition of ka_2:

(28) **Presupposition of ka_2 (irrealis) [revised formulation]**
$[[ka_2\ \phi]]^{w,t,c}$ is only defined if B(c) is a stereotypical modal base and it is the case that for all worlds $w' \in B(c)(w,t)$, $[[\phi]]^{w',t,c} = 0$.

Let's see how (28) can handle conditionals with ka_2 about the future like (26a-c) as well as counterfactual conditionals about the past like (25a-d). First take a future example like (26a). The tense within the main clause introduces a future reference time t'. Due to the stereotypical modal base, ka_2 triggers the presupposition that if the world develops according to normal expectations, the tree will not fall at t'. However, in a past example like (25b), the time t' introduced by the main clause tense precedes the speech time, and hence at t' all the worlds in the stereotypical ordering source are identical to the actual world.

This means that the presupposition triggered by ka_2 is that the cougar did not actually kill a child.

To conclude our discussion of *ka*, recall that we distinguished the deontic ka_1 from the irrealis ka_2. Ideally a unified analysis should be possible. We think that (28b) could be the basis for at least a partial unification: suppose we assume that the deontic ka_1 actually has the same presupposition as ka_2. In other words, a deontic statements of the form ka_1 ϕ also presupposes that in worlds that develop according to normal expectations, ϕ will be false. We leave it for future research to further pursue this idea.

5 Conclusion and Typological Implications

Amerindian languages in general appear to make use of moods rather than modals; see Mithun (1999) for discussion. For example, Mithun notes (1999:173) that Kiowa has an irrealis mode which "marks unrealized events whatever their probability". (See also many examples in Palmer 1995.) This appears to correlate with the fact that these languages have evidential systems. According to K. Chung (*in prep.*) and others (see also Izvorski 1997), epistemic modals focus on differences in probability, while sharing the same modal base and the same ordering source for a given proposition, while evidentials often focus instead on the difference in modal base and/or ordering source. Indeed, an 'evidential' is by definition an element which requires a certain kind of conversational background, namely an epistemic one. Thus, without going so far as to propose a macro-parameter differentiating English-type systems from St'át'imcets-type languages, we conjecture that languages tend to organize their modal systems either "horizontally" (as in Table 1 above) or "vertically" (as in Table 2).

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Department of Linguistics
University of British Columbia
1866 Main Mall, Buchanan E270
Vancouver, British Columbia V6T 1Z1
Canada