

Gitksan modals

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This paper provides a description of the modal system of Gitksan (Tsimshianic), and places the Gitksan system within an emerging formal typology of modality. I show that Gitksan encodes distinctions of modal strength in the circumstantial domain but not the epistemic. I also argue that Gitksan modals are not inherently future-oriented, but obtain their future orientation from the overt future marker *dim*, which appears optionally with epistemic modals and obligatorily with circumstantial ones.

1 Introduction¹

This paper provides a description of the modal system of Gitksan (Tsimshianic), and places the Gitksan system within an emerging formal typology of modality (cf. Rullmann et al. 2008, Vander Klok 2008, Peterson 2010, Menzies 2010, Reis Silva 2010, Deal to appear, among others). The core question is how Gitksan divides up the semantic space in its modal system, and the three main sub-questions are listed in (1).

- (1) a. Does Gitksan make lexical distinctions based on **modal strength**? (e.g., does it lexically distinguish necessity from possibility modals)?
- b. Does Gitksan make lexical distinctions based on **modality type** (e.g., does it lexically distinguish epistemic from deontic modals)?
- c. How does Gitksan express modal-temporal interactions?

I will argue that Gitksan possesses five modals in its core modal system, and that the language encodes distinctions both of modal strength, and of modality type. There is an asymmetry within the system in that the epistemic

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domain does not distinguish modal strength (Peterson 2010), while the circumstantial domain does. The characterization I will argue for is summarized in (2) (all terms will be explained below).

(2)

		POSSIBILITY	(WEAK) NECESSITY
CIRCUMSTANTIAL	PLAIN	<i>da'akhlxw</i>	<i>sgi</i>
	DEONTIC	<i>anook(xw)</i>	
EPISTEMIC	PLAIN	<i>ima('a)</i>	
	REPORTATIVE	<i>gat</i>	

This proposal places the Gitksan circumstantial domain in line with languages like English or Javanese (Vander Klok 2008), in that distinctions of modal strength are encoded, and its epistemic domain in line with languages like St'át'imcets (Lillooet Salish, Rullmann et al. 2008), in that distinctions of modal strength are not encoded. Gitksan is thus an instance of a 'mixed' system, helping to shed light on the types of modal systems which are possible in human languages.

In terms of modal-temporal interactions, I will argue that Gitksan modals are not inherently future-oriented (unlike English modals, according to many current analyses), but that future-orientation is expressed overtly via the future marker *dim*. This marker of futurity appears optionally with epistemic modals, and obligatorily with circumstantial ones.

In section 2 I provide background information, including an introduction to modal terminology, a brief survey of the cross-linguistic literature on modality, and some basics about Gitksan. Section 3 is devoted to epistemic modality, and section 4 to circumstantial modality. Section 5 concludes and raises some theoretical consequences of the findings.

2 Background

2.1 Modality²

Modals are standardly analyzed as quantifiers over possible worlds, and at least in some languages, come in different quantificational strengths (Kratzer 1991, among many others). Different strengths of modals are illustrated in (3).

- (3)
- | | | | |
|----|------------------------------------|----------------|-----------|
| a. | Maria must do the dishes. | NECESSITY | STRONGEST |
| b. | Maria should do the dishes. | WEAK NECESSITY | ↓ |
| c. | Maria may do the dishes. | POSSIBILITY | WEAKEST |

Modals allow different interpretations depending on which subset of possible worlds are quantified over. There is a basic division between epistemic modality, which is concerned with an individual's (usually the speaker's)

² This section can be skipped by those who are familiar with standard classifications of modals (Kratzer 1991, Portner 2009, etc.).

knowledge or evidence, and circumstantial modality, which is concerned with facts about the world.³ An example illustrating the contrast is given in (4), adapted from Kratzer (1991).

- (4) a. Hydrangeas could grow here.⁴ CIRCUMSTANTIAL
b. There might be hydrangeas growing here. EPISTEMIC

Kratzer (1991:646) points out that the modals in (4a) and (4b) are felicitous in different situations. (4a) is appropriate and true in a situation where the climate and the soil in this area are such that hydrangeas would have a chance of growing here. The truth of (4a) does not depend on whether there might actually be hydrangeas growing here, and (4a) can be true even if it is impossible for there currently to be any hydrangeas here. The epistemic (4b), on the other hand, expresses a claim about what might be the case *in our world* given all the available evidence. In contrast to (4a), (4b) is false if we know that there can be no hydrangeas growing here at the time of utterance. We will see in the sections to follow that the circumstantial/epistemic distinction is not only lexically encoded in Gitksan, it has a clear grammatical reflex in the presence vs. absence of obligatory future marking.

Within circumstantial modality, there are various different flavours (which correspond to different ordering sources in the possible worlds analysis, but that will not concern us here). I outline these in the rest of this sub-section. Note that many slightly different classifications have been proposed; the choices made here are not intended to be theoretically significant, but merely to ensure broad coverage of the major types of modality.

2.1.1 Pure circumstantial

Pure circumstantial readings are those which rely only on relevant facts about the world (and have an empty ordering source in a formal analysis). An example of a possibility pure circumstantial modal is the hydrangea case in (4a). A necessity pure circumstantial modal is illustrated in (5).

- (5) Jockl has to sneeze (in view of the present state of his nose, etc.).
(adapted from Kratzer 1991)

Impersonal modality also belongs in this category. The modal in (6) does not talk about any properties intrinsic to the subject of the sentence; in this, it differs from ability interpretations, as discussed in the next sub-section.

- (6) Six people can fit in this car.

³ As observed by Kratzer (2010), anything which is known is also a fact, and therefore the distinction between circumstantial and epistemic modality is simply one of which *type* of facts are relevant.

⁴ Kratzer's original sentence contained *can*, but *could* is preferable for many speakers.

2.1.2 Ability

Ability modals are circumstantial possibility modals; an example is given in (7).

- (7) Roland can walk.

Here, the properties of the subject are relevant; unlike in (6), the truth value of (7) varies depending on who we choose for the subject noun phrase.

2.1.3 Priority

Priority modals are those which impose an ordering on the worlds quantified over, based on such things as the rules, someone's goals, or someone's desires (Portner 2009). Deontic priority modals have interpretations based on rules or requirements. Deontic possibility is permission, as illustrated in (8). In at least some worlds compatible with the rules which hold in the actual world, you eat a cookie.

- (8) You may/can eat a cookie.

Deontic necessity is obligation, as in (9). In all the worlds in which you obey the rules which hold in the actual world, you go to bed.

- (9) You have to/must/should go to bed.

Priority modality which relates to an agent's goals is called teleological. An example is given in (10).

- (10) To get to Whistler, you can/should/have to take Highway 99.

Bouletic modality relates to an agent's desires or wishes, as shown in (11).

- (11) You should try this chocolate. (Portner 2009:135)

2.1.4 Future-in-the-past / counterfactual

Circumstantial modals can be used to make claims about what might or should have happened at some time subsequent to a certain past time. Examples are given in (12).

- (12)a. At that stage, they still could have won the game. (Condoravdi 2002)
b. Given the score at half-time, they should have won.

2.1.5 Quantificational

Some authors have a separate category for quantificational modals (e.g., Brennan 1993, Portner 2009); these appear to impart quantificational force to an indefinite noun phrase. (13a) means that some spiders are dangerous, while (13b) (at least for some speakers of English) means that all spiders are dangerous.

- (13) a. A spider can be dangerous.
b. A spider will be dangerous. (Portner 2009:136)

2.2 Modal-temporal interactions

In this section I introduce two terms from Condoravdi (2002), which will be relevant when we talk about modal-temporal interactions in Gitksan. The first is *temporal perspective (T.P.)*, and is the time at which the worlds the modal quantifies over are calculated. For an epistemic modal, this is the time at which the speaker obtains the relevant evidence, or has the relevant knowledge. In (14), we have a present temporal perspective, because the evidence (the light's being on) holds at the utterance time.

- (14) She must be in her office, her light is on. PRESENT T.P.

For a circumstantial modal, the temporal perspective is the time of the relevant facts. (15) has a past temporal perspective: based on the facts at a certain past time, it was possible for them still to win. The sentence can be true even if at the utterance time, it is no longer possible for them to win (e.g., because they have already lost).

- (15) At that time, they could still have won. PAST T.P.

The second term is *temporal orientation (T.O.)*; this refers to the relation between the temporal perspective and the time of the described event. In (16), we have a present temporal orientation, because the time of the event (her being in her office) coincides with the temporal perspective (the light's being on). In (17) the temporal orientation is future, because the time of the described event (their winning) follows the temporal perspective (the time at which the relevant facts held which made it possible for them to subsequently win). We will see below that temporal orientation is overtly encoded on Gitksan modals (unlike in English).⁵

- (16) She must be in her office, her light is on. PRESENT T.O.

⁵ In Condoravdi's analysis, the temporal perspective is provided by tense. This means that the temporal orientation is a relation between the reference time (provided by tense) and the event time, and is therefore technically an aspect, in the sense of Klein (1994). This approach dovetails very nicely with the Gitksan system, as we will see below.

- (17) At that time, they could still have won. FUTURE T.O.

2.3 Cross-linguistic variation in modal systems

Recent cross-linguistic research has revealed differences in the way languages lexically divide up the semantic space in the modal domain. In languages like English or German, modal auxiliaries tend to divide up the semantic space primarily according to modal strength, leaving modality type largely up to context (cf. Kratzer 1991). For example, we see in (18) that the English modal *must* allows both epistemic and deontic interpretations.

- (18) a. Michl **must** be the murderer. (In view of what is known about the crime.) EPISTEMIC (Kratzer 1991:643)
- b. Jockl **must** go to jail. (In view of what the law provides.) DEONTIC (Kratzer 1991:640)

In terms of modal strength, *must* is always a necessity modal, and lexically contrasts in this respect with possibility modals such as *may*, *might* or *can*. Thus, (19a) means something very different (and weaker) than (18a), and similarly for (19b) vs. (18b).

- (19) a. Michl **may** be the murderer. (In view of what is known about the crime.) EPISTEMIC
- b. Jockl **may** go to jail. (In view of what the law provides.) DEONTIC

In some languages, the modal system is divided up differently. In St'át'imcets, for example, all modals are lexically specified for modality type, but are lexically unspecified for strength (Matthewson et al. 2007, Rullmann et al. 2008, Davis et al. 2009). This is illustrated in (20-21). In (20), we see the epistemic modal *k'a* (glossed as 'inferential' due to its evidential contribution). *K'a* is felicitous both in strong, necessity-type contexts as in (20a), and in weak, possibility-type contexts as in (20b). Neither of these sentences allows any interpretation other than an epistemic one.⁶

- (20) a. *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.*

⁶ The distinction between an affix and a clitic boundary has been added to the St'át'imcets data (with the symbol = indicating a clitic boundary). Some glosses have also been adjusted.

- a. *nilh=k'a* *lh(el)=(t)=en=s=wá(7)=(a)* *ptinus-em-sút*
 FOC=**INFER** from=DET=1SG.POSS=NOM=IMPF=EXIS think-MID-OOC
 'It **must** be from my worrying.' (Rullmann et al. 2008:321)
- b. *wá7=k'a* *séna7* *qwenúxw*
 IMPF=**INFER** COUNTER sick
 'He **may** be sick.' (Context: Maybe that's why he's not here.)
 (Rullmann et al. 2008:321)

A contrasting modal *ka* is illustrated in (21-22). This modal allows either deontic or counterfactual interpretations, and disallows epistemic ones. Again, we see that it fails to distinguish modal strength; it allows either strong, necessity interpretations, as in (21), or weak, possibility interpretations, as in (22).⁷

- (21) *Context: I don't remember if we ate the rabbits or not.*

t'u7 wá7=ka *n-scwákwekw=a* *ts'áqw-an'-em*
 but IMPF=**DEON** 1SG.POSS-heart=EXIS eat-DIR-1PL.ERG
nilh(=t)=s=pápt=s=a *wa7 tecwecw=wít*
 FOC(=DET)=NOM=always=3POSS=EXIS IMPF increase=3PL
lh=as *kwís-alt* *i=sqweyíts=a*
 COMP=3SBJN fall-child DET.PL=rabbit=EXIS
 'But I think we had to eat them because they were always having babies.' (Matthewson 2005:98-99, cited in Rullmann et al. 2008:329)

- (22) *lán=lhkacw=ka* *áts'x-en ti=kwtámst-sw=a,* *t'u7*
 already=2SG.SUBJ=**DEON** see-DIR DET=husband-2SG.POSS=EXIS but
áoz-as *k=wá=su* *xát'-min' k=wá=su*
 NEG=3SBJN DET=IMPF=2SG.POSS want-RED DET=IMPF=2SG.POSS
nás-al'men, *t'u7 áma*
 go-want just good
 'You may go see your husband, but you don't have to.' (literally: '... if you don't want to go, that's okay.') (Rullmann et al. 2008:329-330)

There seems to be a typological split between languages like English or German, where the modals fundamentally 'care about' modal strength, and languages like St'át'imcets (Lillooet Salish), where the modals never encode modal strength. This leads Rullmann et al. (2008) to present the following preliminary classification of modal systems:

⁷ The modal *ka* in (21) modifies the main clause *ts'áqwan'em* 'we eat them'; it merely encliticizes phonologically to the imperfective auxiliary. Note that *nscwákwekwa* 'my heart', although translated as 'I think', does not take a subordinate clause but rather is adverbial in nature.

(23)

	SELECTIVE MODALITY TYPE	UNSELECTIVE MODALITY TYPE
SELECTIVE MODAL STRENGTH	?	English
UNSELECTIVE MODAL STRENGTH	St'át'imcets	?

The table in (23) is simplified because not all languages fit neatly into one cell. Even within English or German, there are cases where modality type is lexically specified. For example, Kratzer (1991:650) observes that in German, the modal *darf* allows only deontic or teleological interpretations, while *wird* allows only epistemic ones.⁸ However, there are still many modal elements in English or German which are unspecified for modality type, including *must*, *may*, *can*, *could*, *should* and German *müssen* or *können*.⁹

Subsequent research has filled in the top left cell in (23); Vander Klok (2008) argues that Javanese modals encode both modal strength and modality type. The Javanese system is summarized in (24).

(24) Javanese modals (Vander Klok 2008)¹⁰

	NECESSITY	POSSIBILITY
DEONTIC	<i>kudu</i>	<i>ento, olèh</i>
EPISTEMIC	<i>mesthi</i>	<i>mungkin</i>

Similarly, Reis Silva (2010, in prep.) argues that Blackfoot (Algonquian) encodes both modal strength and modality type. As mentioned above, I will argue that Gitksan has a mixed system, in which modality type is lexically encoded, but modal strength is encoded only for certain modality types.¹¹

It is important to keep expanding the empirical base of this type of modality research, in order to detect cross-linguistic patterns, and also because evidence about how languages lexically divide up the modal space can shed light on formal analyses of many phenomena. One example of this arises in the

⁸ See Kratzer (2010) for more detailed discussion of modals with specified modality type in German. See also Schwager (to appear) on German, and von Stechow and Gillies (2010) and Matthewson (2010) on English.

⁹ The interpretations of these modals depend in part on syntactic position; see Hacquard (2006), among others.

¹⁰ I have changed the spatial orientation of Vander Klok's table, for consistency with (2) above, and I have also changed her 'universal' and 'existential' to the equivalent 'necessity' and 'possibility', for consistency with terminology used here.

¹¹ Another potential mixed system is Kwak'waka (Wakashan), which may possess variable-strength epistemic modals but no variable-strength circumstantial ones (Stacey Menzies, p.c.). See also Deal (to appear) on Nez Perce (Penutian), which does not make modal strength distinctions in the non-epistemic domain, and Gipper (2010) for the claim that Yurakaré (Central Bolivia, unclassified) does not express a contrast between necessity and possibility in the epistemic domain.

area of evidentiality. Earlier study of evidential systems had sometimes led to the claim that evidentials were not analyzable as modals, because evidentials typically do not make lexical distinctions based on speaker certainty (which would correspond to modal strength); see for example de Haan (1999), Aikhenvald (2004). As shown by Matthewson et al. (2007) and Rullmann et al. (2008), *all* modals in St'át'imcets fail to lexically distinguish modal strength. This discovery therefore eliminates one conceptual argument against a modal analysis of evidentials.¹²

2.4 The Gitksan language and prior research on Gitksan modality

Gitksan is a Tsimshianic language spoken in north-western British Columbia, Canada.¹³ According to Peterson (2010), there are approximately 400 speakers remaining. For a detailed discussion of the grammatical properties of Gitksan, see Rigsby (1986), and see also Tarpent (1987) on the very closely related Nisgaha.

The data to be presented here are from the author's fieldwork unless otherwise noted, and were collected using standard semantic elicitation techniques (cf. Matthewson 2004), as well as via storyboards. Storyboards are series of pictures which prompt the speaker to tell a story in their own words, and which are designed to elicit certain constructions or lexical items in specified discourse contexts.

Data are presented in the orthography developed by Hindle and Rigsby (1973); see Appendix A for details, and for a list of abbreviations used in morpheme glosses. Morpho-phonological changes sometimes obscure the base form of morphemes; one of the most ubiquitous of these is the voicing of (non-glottalized) obstruents before a vowel (see Rigsby 1986:133, Tarpent 1987:44). The orthography represents the surface pronunciation, and I follow that practice here. There are several lexical items which are pronounced differently by my consultants than the spelling in the available literature; these probably represent dialect differences, and they are listed in Appendix B.

There are variations in glossing conventions for Gitksan in the literature. For example, Rigsby (1986) glosses the *=hl* enclitic as CNN 'connective', Hunt (1993) glosses it as CN 'connective', Peterson (2010) glosses it as CND 'common noun determiner', and Tarpent (1987) glosses the Nisgaha equivalent as NC, 'non-determinate connective'. When citing data from other sources, I have in some cases altered glosses for consistency with those used here.

I turn now to some relevant features of Gitksan in the areas of tense and modality. First, Gitksan does not overtly distinguish past vs. present tense (Jóhannsdóttir and Matthewson 2007). This is illustrated in (25-26) for eventive

¹² Of course, there are other reasons why some evidentials are argued not to be modal; see Faller (2002, 2011), Murray (2010), Peterson (2010), among others, for discussion.

¹³ The native spelling for the language depends on the dialect. One of my consultants (BS) is from Kispiox and speaks Gitksanimx; the other (VG) is from Gitanyow (Kitwancool) and speaks Gyanimx.

- (30) *(**dim**) sil ga-baga=hl Canucks=hl Oilers t'aahlakxw
 *(**FUT**) with PL-try=CN Canucks=CN Oilers tomorrow
 'The Canucks play the Oilers tomorrow.' (BS)

I assume a phonologically null non-future tense morpheme in Gitksan (following Jóhannsdóttir and Matthewson 2007). This non-future tense morpheme is there in past or present-tense sentences such as (25-26), restricting the temporal reference to non-future. In cases of future time reference, the null tense co-occurs with *dim*, exactly as proposed by Abusch (1985) for English WOLL, the element which surfaces either as *will* or *would*, depending on whether it combines with present or past tense.

Previous research on Gitksan and Nisgha has identified the enclitics *ima('a)* and *gat* as epistemic modals (although not necessarily explicitly assigning them those labels).¹⁵ Tarpent (1987:497) describes Nisgha *ima('a)* as a 'dubitative' marker, an evidential which expresses that 'the speaker thinks that what he says could be true on the basis of what he knows or can infer, but does not want to commit himself as he could be proved wrong.' Tarpent (1984:359) translates *ima('a)* as 'probably', and states that it 'indicates a truth value based on inference, and therefore subject to confirmation.' Tarpent's (1984:362) description of the reportative *gat* is that 'the speaker disclaims responsibility for the truth of the utterance ... because he is only reporting information originating with others.'

In formal research on Gitksan, Peterson (2010) provides an analysis of both *ima('a)* and *gat* as epistemic modals. Section 3 is devoted to an examination of these elements, and draws heavily on Peterson's work.

There has been almost no discussion of circumstantial modality in Gitksan; an exception is a brief discussion in Davis et al. (2009). I discuss circumstantial modals in detail in Section 4.

3 Epistemic modality in Gitksan

As noted above, Peterson (2010) analyzes the second-position enclitics *ima('a)* and *gat* as epistemic modals. In this section I deal with each in turn, and then discuss modal-temporal interactions.

¹⁵ Both these modals have variant spellings in the literature. The first is spelled *ima* by Hunt (1993) and Peterson (2010), and *(i)ma'a* by Tarpent (1984) for Nisgha. Tarpent (1987) notes variant pronunciations depending on environment, and uses the citation form *(y)ima'a*. My consultants pronounce this modal in two distinct ways. One (BS) pronounces it with a long *a*, resulting in the spelling *imaa*. The other (VG) pronounces it with a short *a* and a glottal stop, resulting in the spelling *ima'*. I will use *ima('a)* as the citation form, but in the data, I will spell it according to which speaker gave the sentence. Note that historically, the form with the long vowel may have been derived from the form with the glottal stop (Henry Davis, p.c.).

For *gat*, the issue is not one of pronunciation but merely of convention, depending on whether the author cites the form as it is pronounced (with voicing of the uvular due to the following vowel; Tarpent 1984, 1987) or in its underlying form (Peterson 2010). I use the surface form here.

3.1 *Ima('a)*

A typical example of epistemic *ima('a)* is given in (31). Here, ‘a speaker is claiming that, in some possible world consistent with what they know about August, or their experience with picking berries, the berries are ripe’ (Peterson 2010:2):

- (31) mugw=**ima**=hl maa'y
 ripe=**EPIS**=CN berries
 ‘The berries might be ripe.’ (Peterson 2010:2)

More examples illustrating the epistemic nature of *ima('a)* are given in (32-34).

- (32) *Context: You hear pattering, and you're not entirely sure what it is.*

yugw=**imaa/ima'**=hl wis
 PROG=**EPIS**=CN rain
 ‘It might be raining.’ (BS, VG)

- (33) *Context: What's that noise?*¹⁶

a. limx=**imaa/ima'**=t Bob
 sing=**EPIS**=PN Bob
 ‘Bob might be singing.’ (BS, VG)

b. yugw=**imaa/ima'**=hl limx-s Bob
 PROG=**EPIS**=CN sing-PN Bob
 ‘Bob might be singing.’ (BS, VG)

- (34) yugw=**imaa**=hl ama-'mas-t gan wihl ts'aa
 PROG=**EPIS**=CN good-grow-3SG.II COORD PART PART
 'magalu=hl ii'wxwt loo-t
 crazy.PL=CN man.PL OBL.PRO-3SG.II
 ‘Maybe she is pretty, that's why the men are crazy for her.’ (BS)

Peterson provides evidence that *ima('a)* is only interpretable as epistemic; he contrasts it with the verb *da'akhlxw*, which is a circumstantial possibility modal (Peterson 2010:154). The contrast is shown in (35), which is adapted from Kratzer's (1991) hydrangea example in (4) above. This context is the circumstantial one; you have no reason to believe huckleberries might actually be growing here, you are merely reasoning based on the landscape. We see that *ima('a)* is infelicitous, and *da'akhlxw* is used.

¹⁶ The progressive/imperfective *yukw* is preferred when *ima('a)* is used. However, (33a) shows that epistemic modal sentences do not require *yukw*. More research is needed into Gitksan's aspectual system.

(35) *Context: You're up in the Suskwa and notice a burnt patch of forest. You know that huckleberries typically take seed in burnt alpine areas.*

a. **da'akhlxw**=hl dim lim_{XS}=hl maa'y go'osun
 CIRC=CN FUT grow=CN berries LOC.here
 'Berries might/can/are able to grow here.'

b. # lim_{XS}=**ima**=hl maa'y go'osun
 grow=EPIS=CN berries LOC.here
 'Berries might be growing here.' (Peterson 2010:154)

Peterson also provides evidence that *ima('a)* has variable modal strength: it can function as anything from a possibility to a necessity modal.¹⁷ Initial evidence for this comes from the wide range of English translations offered for *ima('a)*, as shown in (36). As Peterson observes (2010:157), the context here 'is simple enough that both *must* and *might* are felicitous translations in English: depending on a speaker's previous experiences with John and his rod and tackle box, John might be fishing, or he must be fishing.'

(36) *Context: You're wondering where your friend is. You notice his rod and tackle box are not in their usual place.*

yugw=**ima**=hl dim iixw-t
 PROG=EPIS=CN FUT fish-3
 'He might be going fishing.'
 'He must be going fishing.'
 'He's probably going fishing.'
 'He's likely going fishing.'
 'He could be going fishing.'
 'Maybe/perhaps he's going fishing.' (Peterson 2010:157)

Peterson observes that the default interpretation of *ima('a)* is weak (as in (31-34) above), but it is also acceptable in contexts which support or even require a necessity interpretation. One such example is given in (37). Here, it is more likely that the speaker is making a necessity claim than a possibility one.

(37) *Context: The speaker's father was away frequently when she was a child.*

¹⁷ In terms of the formal analysis, Peterson uses existential quantification plus an ordering source which derives strengthened readings. Deal (to appear) offers an alternative analysis of a variable-strength modal in Nez Perce, whereby it is simply a possibility modal. Peterson's and Deal's analyses make different empirical predictions only for downward-entailing contexts, and the relevant data to distinguish them have not yet been gathered for Gitksan.

naa'a=**ima** 'an yookxw-in-'y
 mother(informal)=**EPIS** AX eat-CAUS-1SG
 'It must've been mother who fed/cooked for me.' (Peterson 2010:157)

The variable modal strength of *ima('a)* is confirmed in my own fieldwork. Cases of *ima('a)* in situations where the evidence is strong enough to support a necessity claim are given in (38-40).

- (38) *Context: You're on the streets of Vancouver on the night of the Canucks game and you hear excited hollering coming from every house.*

yugw=**ima'**=hl xstaa-diit
 PROG=**EPIS**=CN win-3PL.II
 'They're probably winning.' (VG)

- (39) *Context: There was a bad can of fish; everyone at the dinner got sick (context adapted from Peterson 2010:158).*

yugw=**ima'**=hl nee=dii am=hl hon=hl gup-diit
 PROG=**EPIS**=CN NEG=**CONTR** good=CN fish=CN eat-3PL.II
 'The fish they ate must've been bad.' (VG)

- (40) *Context: Joe left the meeting looking really green in the face and sweaty. Someone asks you why he left.*

yugw=**imaa**=hl siipxw-t
 PROG=**EPIS**=CN sick-3SG.II
 'He must have been sick.' (BS)

Summarizing the results of this section, we have seen that Gitksan *ima('a)* is an epistemic modal which is felicitous in a range of contexts corresponding to different modal strengths. In the next sub-section we turn to a second epistemic modal, which is specialized for a particular kind of evidence, namely reports.

3.2 Gat

Examples of reportative *gat* are given in (41-42).

- (41) 'maj-i-(t)=**gat**=hl ha-'nii-guyp'ax 'a=hl lo'op
 hit-TRA-3SG.II=**REPORT**=CN INSTR-in-light LOC=CN rock
 'I hear he hit the window with a rock (and broke it).'
 'Apparently, he hit the window with a rock.' (Peterson 2010:165)

- (42) *Context: Your brother told you the berries are ripe now. Later, you tell*

me the berries are ripe, based on what your brother told you.

hlaa mukw-t=**gat**=hl maa'y
 INCEPT ripe-3SG.II=**REPORT**=CN berries
 'The berries are ripe (I heard it).' (BS)

Gat has typical reportative semantics, being felicitous only when the speaker has obtained the relevant information via a report from a third person (see also Tarpent 1984 on Nisgha *gat*). Peterson (2010) argues in detail that *gat* has the semantics of an epistemic modal, and that it has variable modal strength, just like *ima('a)*. *Gat* is felicitous both when the speaker heard the information from a very reliable source (this corresponds to a necessity interpretation: given what I heard, this *must* be the case), and also when the information was obtained from a less reliable source (a possibility interpretation: given what I heard, this *might* be the case). See Peterson (2010:165-166) for discussion and examples. Peterson also shows that *gat* is not accepted if the speaker knows the embedded proposition is false, which is predicted for a reportative with modal semantics (see Matthewson et al. 2007 for detailed discussion of a similar modal reportative in St'át'imcets).

(43) *Context: You know John was at work yesterday.*

si-hon=**gat**=t John k'yoots
 CAUS-fish=**REPORT**=PN John yesterday
 '[I heard] John canned fish yesterday.'

Consultant's comment: "Why say you heard it from someone else when you know it's not true yourself?" (Peterson 2010:123)

The conclusion – already argued for by Peterson (2010) – is that *gat* is a reportative epistemic modal, with variable modal strength. In the next subsection we turn to the issue of modal-temporal interactions in the epistemic domain.

3.3 Modal-temporal interactions with epistemic modals

Before we look at the Gitksan facts with respect to modal-temporal interactions, let's consider what we predict will happen. According to Condoravdi (2002), the *temporal perspective* of an unembedded modal is given by the tense. Assuming a null non-future tense in Gitksan as outlined above, this predicts that the temporal perspective of both *ima('a)* and *gat* should be able to be past or present. In other words, the modals should be felicitous when the claim is based on evidence gained prior to the utterance time, or when the evidence holds at the utterance time. With respect to *temporal orientation*, Condoravdi analyzes English possibility modals as being inherently future-oriented. Along with certain assumptions about the temporal interpretation of

different aspectual classes, her analysis correctly derives the core facts for an English epistemic possibility modal like *might*, namely that a future orientation is permitted with stative predicates, and required for eventive predicates (in the perfective aspect). This is shown in (44):

- (44) a. He might run. FUTURE T.O. ONLY
 b. He might be sick. PRESENT / FUTURE T.O.

(44a) makes a claim only about a potential running which takes place after the utterance time; (44b) can be talking either about a sickness which coincides with the utterance time, or will happen in the future. (See Condoravdi's paper for the formal analysis which derives these facts.) We will see below that while Condoravdi's predictions about temporal perspective are upheld (with one principled exception for present-perspective *gat*), the predictions about temporal orientation based on English do not extend to Gitksan. The data suggest that we will need a semantics for Gitksan epistemic modals which is not inherently future-oriented.

3.3.1 Modal-temporal interactions with *ima('a)*

Ima('a) is usually interpreted with a present temporal perspective. In all the cases seen so far (e.g., (31-34) above), the speaker makes an epistemic modal claim based on his/her knowledge at the utterance time. Cases of unambiguously past temporal perspective for epistemics involve situations where at some time in the past, there was evidence that something was possible or necessary, but at the utterance time, that evidence no longer holds or the speaker knows the embedded proposition to be false (no longer possibly true). Examples of this type are given in (45-46).

- (45) *Context: When you looked out your window earlier today, water was falling, so it looked like it was raining. But you found out later it was the gutters leaking.*

yugw=**imaa**=hl wis da'awhl
 PROG=EPIS=CN rain then
 'It might have been raining earlier.' PAST T.P. (BS)

- (46) *Context: The Canucks were playing last night. You weren't watching the game but you heard your son sounding excited and happy from the living room where he was watching the game, so you thought they were winning. You found out after the game that the Canucks lost 20-0, and your son was happy about something else that his friend had told him on his cellphone.*

yugw=**imaa**=hl xstaa-diit
 PROG=EPIS=CN win-3PL.II PAST T.P. (BS)
 ‘They might have been winning.’ (according to my evidence last night)

In terms of temporal orientation (the relation between the temporal perspective and the described event), Gitksan displays a strict requirement: the future marker *dim* is both necessary and sufficient for a future orientation of the modal. Thus, in the absence of *dim*, a sentence containing *ima('a)* can only make a claim about a potential event which takes place either before, or concurrently with, the time of the evidence for that event. When *dim* is present, the potential event may only occur after the time of the evidence. A typical contrast showing this is given in (47).¹⁸

(47) a. *Context: You can hear people hollering, so the Canucks might be winning.*

yugw=**imaa**=hl xstaa-diit
 PROG=EPIS=CN win-3PL.II PRESENT T.O. (BS, VG)
 ‘They might be winning.’

b. *Context: You are watching the Canucks. They might win.*

yugw=**imaa** **dim** xstaa-diit
 PROG=EPIS **FUT** win-3PL.II
 ‘They might win.’ FUTURE T.O. (BS)

(48-49) are a minimal pair showing that *dim* is necessary and sufficient for a sentence containing *ima('a)* to be accepted in a context with a future temporal orientation.

(48) yugw=**imaa/ima'**=hl wis
 IMPF=EPIS=CN rain
 ‘It might be raining.’ / ‘It might have rained.’
 ≠ ‘It might rain (in the future).’ (BS, VG)

√ *Context: You see the flowers looking fresh and damp and puddles.*

PAST T.O.

√ *Context: You hear pattering on the roof.*

PRESENT T.O.

Context: You hear thunder, so you think it might rain soon.

FUTURE T.O.

¹⁸ The Nisgha data presented in Tarpent (1984) are also consistent with the claim that epistemic future orientation is provided by the combination of *ima('a)* plus *dim*.

- (49) yugw=**imaa/ima**'=hl **dim** wis
 IMPF=EPIS=CN FUT rain
 'It might rain (in the future).'
 ≠ 'It might be raining / It might have rained.' (BS, VG)
- # Context: *You see the flowers looking fresh and damp and puddles.*
 PAST T.O.
- # Context: *You hear pattering on the roof.*
 PRESENT T.O.
- √ Context: *You hear thunder, so you think it might rain soon.*
 FUTURE T.O.

The same facts hold with stative predicates, as shown in (50-51).

- (50) yugw=**imaa/ima**'=hl siipxw-t
 IMPF=EPIS=CN sick-3SG.II
 'He might be sick (now) / He might have been sick.'
 ≠ 'He might be sick (in the future).' (BS, VG)
- √ Context: *Why wasn't Joe at the meeting yesterday?*
 PAST T.O.
- √ Context: *Why isn't Joe here?* PRESENT T.O.
- # Context: *She's wearing no coat in the rain, she might get sick.*
 FUTURE T.O.

- (51) yugw=**imaa/ima**'=hl **dim** siipxw-t
 IMPF=EPIS=CN FUT sick-3SG.II
 'He might be sick (in the future).'
 ≠ 'He might be sick (now) / He might have been sick.' (BS, VG)
- # Context: *Why wasn't Joe at the meeting yesterday?*
 PAST T.O.
- # Context: *Why isn't Joe here?* PRESENT T.O.
- √ Context: *She's wearing no coat in the rain, she might get sick.*
 FUTURE T.O.

The stative, *dim*-less case in (50) displays an interesting contrast with English. In English, temporally unmarked epistemic statives can be future-oriented, as shown in (44b) above; in Gitksan they cannot. I argue in Matthewson (2011) that this follows from the absence of any future-orientation in the lexical semantics of epistemic modals in Gitksan (unlike in English; cf. Condoravdi 2002).

(47-51) showed cases with present temporal perspectives and all possible temporal orientations, but for *past* temporal perspectives, we have so far only seen present temporal orientations, as in (45-46), where the evidence held at some past time, about a potential event taking place at that same past

time. In order to complete the paradigm, we need cases with past temporal perspectives and past or future temporal orientations. (52-55) show again that *dim* is necessary and sufficient for a future temporal orientation for *ima('a)*. (In (52), I give versions both with and without the progressive aspect on *ima('a)*.)

(52) *Context: When you looked out your window earlier today, the ground was wet, so it looked like it might have rained. But you found out later that the sprinklers had been watering the ground.*

- a. yugw=**imaa**=hl (#**dim**) wis da'awhl
 IMPF=**EPIS**=CN (#**FUT**) rain then
 'It might have rained.' [based on my evidence earlier] (BS)
- b. (#**dim**) wis=**ima'** da'awhl
 (#**FUT**) rain=**EPIS** then
 'It might have rained.' [based on my evidence earlier]
 PAST T.P., PAST T.O. (VG)

Consultant's comment: "You can't use the future tense in front of that ... 'It will rain a while ago.' It doesn't make sense."

(53) *Context: The Canucks played last night. You didn't watch the game but your son watched it at his house. You were wondering if they won or not. After the game, he called you and his voice sounded excited and happy, so you thought they might have won. But then he told you that the Canucks lost 20-0, and he was happy about something else.*

- yugw=**imaa**=hl xstaa-diit
 PROG=**EPIS**=CN win-3PL.II
 'They might have won.'
 [according to my evidence at that time last night]
 PAST T.P., PAST T.O. (BS)

(54) *Context: This morning you looked out your window and judging by the clouds, it looked like it might have been going to rain, so you took your raincoat. Later you're explaining to me why you did that.¹⁹*

- yugw=**imaa**=hl *(**dim**) wis
 PROG=**EPIS**=CN *(**FUT**) rain
 'It might have been going to rain.' PAST T.P., FUTURE T.O. (VG)

¹⁹ Both consultants reject the *dim*-less versions for (54-55); however they also do not prefer the versions with *dim*. They prefer paraphrases meaning 'I thought it was going to rain', as for example in (i).

- (i) ha'nigood-'y ji **dim** wis
 think-1SG.II IRR **FUT** rain
 'I thought it was going to rain.' (BS)

- (55) *Context: You saw your granddaughter going out into the pouring rain without any coat and you thought she might get sick from that. So you told her to take her coat. Later you're explaining to me why you did that.*

yugw=imaa=hl *(**dim**) siipxw-t
 PROG=EPIS=CN *(**FUT**) sick-3SG.II
 'She might have been going to get sick.'
 PAST T.P., FUTURE T.O. (VG)

Summarizing this sub-section, we have seen that *ima('a)* is compatible with either past or present temporal perspective, and allows past or present temporal orientation in the absence of *dim*. The addition of *dim* gives a future orientation.

3.3.2 Modal-temporal interactions with *gat*

Gat displays very similar results to *ima('a)*, with one exception: the temporal perspective is necessarily past with *gat*. Intuitively, this follows from the nature of the evidential restriction on *gat*, since the report must always have taken place before the utterance of the *gat*-sentence. Just like with *ima('a)*, *gat*-marked utterances have a future temporal orientation if and only if *dim* is present. That is, the *dim* is necessary and sufficient to ensure that the potential event takes place after the time of the report. Compare (42) above, which lacks *dim* and is present-oriented, with (56), which contains *dim* and is future-oriented.

- (56) *Context: Your brother told you the berries are going to be ripe tomorrow. Later on the same day, you tell me:*

hlaa yukw=**gat** **dim** mukw=hl maa'y ligi t'aahlakxw
 INCEPT PROG=**REPORT** FUT ripe=CN berries INDEF tomorrow
 'The berries are going to be ripe tomorrow (I heard).' (BS)

A minimal pair with and without *dim*, with judgments for all temporal interpretations, is given in (57-58).

- (57) limx=**gat** Bob
 sing=**REPORT** Bob
 '(I heard that) Bob sang.' (BS)

- √ *Context: Yesterday, Henry told you that Bob sang last week at the gathering.* PAST T.O.
 √ *Context: Yesterday, Henry told you that Bob was singing (while he was talking).* PRESENT T.O.

- # Context: Yesterday, Henry told you that Bob would be singing later that day. FUTURE T.O.
 # Context: Yesterday, Henry told you that Bob would be singing next week. FUTURE T.O.

(58) **dim** limx=**gat** Bob
 FUT sing=**REPORT** Bob
 ‘(I heard that) Bob would/will sing.’ (BS)

- # Context: Yesterday, Henry told you that Bob sang last week at the gathering. PAST T.O.
 # Context: Yesterday, Henry told you that Bob was singing (while he was talking). PRESENT T.O.
 √ Context: Yesterday, Henry told you that Bob would be singing later that day. FUTURE T.O.
 √ Context: Yesterday, Henry told you that Bob would be singing next week. FUTURE T.O.

Notice that *dim* does not require the event to take place after the utterance time, but only after the temporal perspective. This is predicted by an analysis of *dim* as ordering the event time after the reference time, which is the same as the temporal perspective in these cases (see Matthewson 2011, in prep. for such an analysis).

The same requirement of *dim* for a future temporal orientation with *gat* seems to hold in Nisgaha, as suggested by data in Tarpent (1984):

(59) ts’axw=**ga**=hl sils Peter
 considerable=**REPORT**=CN drunk Peter
 ‘They say Peter was very drunk.’ (Tarpent 1984:362)

(60) **dim** naksgwit=**gas** Peter t Lilian
 FUT marries=**REPORT.CASE** Peter PN Lilian
 ‘They say Peter is going to marry Lilian.’ (Tarpent 1984:362)

3.4 Summary of epistemic modality

The data presented in this section have shown that Gitksan possesses two epistemic modals, which differ in that one of them is restricted to allowing evidence which comes via reports. Both the epistemic modals have variable modal strength, allowing anything from possibility to necessity interpretations. Both allow past temporal perspectives, and both allow future temporal orientations only if *dim* is present. *Ima(’a)* does, but *gat* does not, allow present temporal perspectives (since for *gat* this would involve hearing the report at the utterance time). The temporal results are summarized in (61), with numbers

given for one relevant example of each type.²⁰

(61)

		TEMPORAL ORIENTATION		
		PAST	PRESENT	FUTURE
TEMPORAL PERSPECTIVE	PAST	<i>ima('a)</i> (52)	<i>ima('a)</i> (45)	<i>ima('a) dim</i> (54)
		<i>gat</i> (57a)	<i>gat</i> (57b)	<i>gat dim</i> (58c)
	PRESENT	<i>ima('a)</i> (39)	<i>ima('a)</i> (33)	<i>ima('a) dim</i> (51)

4 Circumstantial modality in Gitksan

In this section I will show how all the sub-types of circumstantial modality listed in section 2.1 above are encoded in Gitksan.

4.1 Circumstantial possibility: *da'akhlxw*

Rigsby (1987:240) glosses the verb *da'akhlxw* as 'be able to'. I show in this section that *da'akhlxw* is used for all kinds of circumstantial possibility, including pure circumstantial, ability, and priority interpretations. *Da'akhlxw* is acceptable but not preferred for expressing priority interpretations, such as bouletic or deontic readings; there is an alternative lexical item for deontic possibility, as we will see below.

Syntactically, *da'akhlxw* has two manifestations. Usually, it is an independent-order transitive verb, which takes an individual subject and a subordinate clause which functions as direct object. *Da'akhlxw* may also appear as an intransitive verb in an impersonal construction, in a structure similar to 'It is possible that ...'. No semantic differences in terms of available readings have been detected for the personal vs. impersonal construction, although further research is required.

Pure circumstantial possibility is encoded by *da'akhlxw*, as already noticed by Peterson (2010); see (31a), repeated here as (62). The version my consultant volunteers is given in (63); he also accepts (62). Notice that (62) vs. (63) contrast in the respect just noted: (62) is intransitive, (63) is transitive.

- (62) **da'akhlxw**=hl dim limxs=hl maa'y go'osun
CIRC.POSS=CN FUT grow=CN berries LOC.here
 'Berries might/can/are able to grow here.' (Peterson 2010:154)

²⁰ I exclude from consideration cases with a future temporal perspective, since for an epistemic modal, these would involve pragmatically odd meanings which express that some evidence or knowledge will arise in the future. These meanings are not expressible in English using modal auxiliaries; they would be something like 'It will might rain', meaning 'I will have evidence that it might rain.'

- (63) **da'akhlxw**-i=hl maa'y dim limxs-t
 CIRC.POSS-TRA=CN berries FUT grow-3SG.II
 'Berries could grow here.' (VG)

Recall that the pure circumstantial interpretation (unlike the epistemic) allows the speaker to know that there are not actually any berries growing here. This is shown for *da'akhlxw* in (64) (each consultant offers a slightly different version of the sentence).²¹

- (64) a. nee=dii wan=hl maa'y go'osun ii ap
 NEG=CONTR sit=CN berries LOC.here and EMPH
 da'akhlxw dim wan-t
 CIRC.POSS FUT sit-3SG.II
 'There are no berries around here, but they could grow here.' (VG)
- b. nee=dii 'wihl wan=hl maa'y goosun=sa ii
 NEG=CONTR PART sit=CN berries LOC.here=here and
 ap **da'akxw**-diit dim limxs-diit goosun
 EMPH CIRC.POSS-3PL.II FUT grow-3PL.II LOC.here
 'There are no berries around here, but they could grow here.' (BS)

In (62-64), *da'akhlxw* co-occurs with the future marker *dim*. The consultant rejects a version of (63) which lacks *dim*, commenting "No, you couldn't remove the *dim*." In fact, *da'akhlxw* in all its uses obligatorily requires *dim*; this will be seen in all the data below, and discussed further at the end of this section.

More examples of pure circumstantial possibility are given in (65-66).

- (65) **da'akxw**-i=hl t'k'alpxaa gat *(dim) luu wan-diit goo=hl
 CIRC.POSS-TRA=CN four people *(FUT) in sit-3PL.II LOC=CN
 ts'im kyaa tust
 inside car that
 'Four people can fit in this car.' (BS)

- (66) *Context: We are at a party and people are wanting rides home. I ask you if my friend Sally can go home in your car. The answer is yes, because your car is big enough, it holds five.*

ee'e, **da'akxw**-i-t *(dim) makxw-t loo-'y
 yes CIRC.POSS-TRA-3SG.II *(FUT) catch.a.ride OBL-1SG.II
 'Yes, she can come with me.' (BS)

²¹ BS pronounces the modal as *da'akxw*. I will write the longer form, *da'akhlxw*, in the data below, except where an example is only from this consultant. BS also usually does not use *da'akxw* for pure circumstantial interpretations (although she volunteered (64b)). She translates (62) as 'Berries are able to grow here' and comments "Maybe [*da'akxw*] doesn't apply to plant life."

Ability interpretations of *da'akhlxw* are shown in (67-69). A co-occurring *dim* is obligatory.

- (67) **da'akhlxw-i-s** Henry *(dim) jam-t
CIRC.POSS-TRA-PN Henry *(FUT) cook-3SG.II
 'Henry is able to cook.' / 'Henry was able to cook.' (BS, VG)

Consultant on the *dim*-less version: "Kids can speak like that. But no, you need something in there."

- (68) **da'akhlxw-i-s** Henry 'wii-'nakw *(dim) wil gos-t
CIRC.POSS-TRA-PN Henry big-long *(FUT) COMP jump-3SG.II
 'Henry can jump high.' (BS)

- (69) **da'akhlxw-i='y** *(dim) hahla'alsd-'y k'yoots
CIRC.POSS-TRA=1SG.II *(FUT) work-1SG.II yesterday
 'I was able to work yesterday.' (BS, VG)

A minimal pair which contrasts the ability interpretation of *da'akhlxw* with the epistemic interpretation, rendered by *ima('a)*, is given in (70-71) (adapted from von Stechow and Heim 2007).

- (70) *Context: You are talking about the ability of your friend Cathy to make cheese.*

da'akhlxw-i-s Cathy dim(-t) jap=hl tsiiz a=hl
CIRC.POSS-TRA-PN Cathy FUT(-3SG.II) make=CN cheese LOC=CN
 miilik tun²²
 milk DEM
 'Cathy can make cheese out of this milk.' (BS, VG)

- (71) *Context: I ask you if I can drink this milk, and you think Cathy might actually make cheese out of it.*

yugw=**imaa** dim-t jap-s Cathy tsiiz loo-t
PROG=EPIS FUT-3SG.II make-PN Cathy cheese OBL-3SG.II
 'Cathy might make cheese out of this milk.' (BS)

One often-discussed property of ability attributions is whether they have actuality entailments (cf. Bhatt 1999, Hacquard 2006, Davis et al. 2009). Actuality entailments (AEs) are when a perfective/past tense circumstantial possibility modal gives rise to an entailment that the relevant event took place. As shown in (72), Gitksan *da'akhlxw* does not give rise to AEs. This makes it

²² Both consultants volunteered the same sentence here, but with slight differences in pronunciation due to dialect differences.

similar to the St'át'imcets circumstantial modal *ka-...-a* as discussed by Davis et al. (2009). See Matthewson (2011, in prep.) for an explanation for the absence of AEs with *da'akhlxw* which relies on the presence of *dim*.

- (72) **da'akhlxw-i='y** *(dim) hahla'alsd-'y (k'yoots), ii (ap)
CIRC.POSS-TRA-1SG.II *(FUT) work-1SG.II (yesterday) and (EMPH)
 nee=dii wil-'y
 NEG=CONTR COMP-1SG.II
 'I was able to work yesterday, but I didn't.' (BS, VG)

Ability-like interpretations with non-agentive subjects are also possible, as shown in (73-74).

- (73) **da'akxw-i=hl** aats'ip tun=sa dim **k'ak'-t**
CIRC.POSS-TRA=CN door DEM=here FUT open-3SG.II
 'The door can open.' (BS)

- (74) **da'akxw-i=hl** t'uuts'xw tun *(dim) **k'oj-a-t**
CIRC.POSS-TRA=CN knife DEM *(FUT) cut-TRA-3SG.II
 'This knife can cut.' (BS)

Turning to priority interpretations, we see that *da'akhlxw* allows bouletic interpretations, as shown in (75). Both consultants originally offered plain future sentences lacking *da'akhlxw* when translating from English in this discourse context. However, they offered (75a,b) when they were asked if a statement in this context could begin with *da'akhlxw*. This suggests that *da'akhlxw* is possible but dispreferred with a bouletic interpretation.

(75) *Context: Given that you want to be thinner, ...*

- a. **da'akhlxw-i-n** dim sa-yeed-n=hl gabii=hl
CIRC.POSS-TRA-2SG.II FUT PV-lesssen-2SG.II=CN amount=CN
 cake=hl gub-n
 cake=CN eat-2SG.II
 'You could eat less cake.' (VG)
- b. **da'akxw-i-n** mi=dim ha'w-din=hl ixsda-m anaax
CIRC.POSS-TRA-2SG.II 2SG.I=FUT stop-TRA=CN sweet-ATTRIB bread
 'You could stop eating cake.' (BS)

Da'akhlxw is also possible in teleological contexts, as shown in (76).

- (76) *Context: We are burglars in someone's house, and we discover the residents are still at home, so we have to be quiet if we don't want to be caught. Finally the people leave, so we can make noise now.*

- a. woy hlaa dim **da'akhxw**-²³m dim ha'jimuxw²³
 okay INCEPT FUT CIRC.POSS-1PL.II FUT once.again
 gats'eekxw-²³m
 make.noise-1PL.II
 'Now we can make noise.' (VG)
- b. hlaa dim dip **da'akxw** dim hoo g'ats'eekxw-²³m gyu'un
 INCEPT FUT 1PL.I CIRC.POSS FUT also make.noise-1PL.II now
 'Now we can make noise.' (BS)

In deontic possibility (i.e., permission) contexts, *da'akhxw* is possible, but competes here with a specialized deontic possibility modal, *anook(xw)* (discussed in the next section). Examples showing *da'akhxw* in permission contexts are given in (77-78).

- (77) mahl-di-s noox-²³y **da'akhxw**[-i]-²³y dim ma'us-²³y
 tell-TRA-PN mother-1SG.II CIRC.POSS[-TRA]-1SG.II FUT play-1SG.II
 'My mother told me I could play.' (VG)
- (78) ii he-s Mary, "mahl-di-s noo-²³y dim
 and say-PN Mary tell-TRA-PN mother-1SG.II FUT
da'akxw dim ma'us-²³y"
 CIRC.POSS FUT play-1SG.II
 'And Mary said, "My mother told me I could play."' (BS, Totem Field Storyboard Collection, "Chore Girl")

I have claimed that *da'akhxw* has a specified modal strength, as a possibility modal. This is supported by all the data shown so far. Further evidence that *da'akhxw* is a specialized possibility modal comes from the fact that it is rejected when the context warrants a necessity claim instead:

- (79) *Context: Bob ate bad chicken last night. He should be sick now.*

?? **da'akxw**=hl dim sim siipxw-t
 CIRC.POSS=CN FUT very sick-3SG.II
 Attempted: 'He should be very sick.'

Consultant's comment: "Not very good. Nothing wrong with [the sentence] because *da'akxw* is 'able'. He's able to be very sick."

Examples showing the interaction of *da'akhxw* with negation are shown in (80-83). We obtain a 'not possible' reading, just like for English *can't* (see Horn 1989).

²³ The morpheme breakdown of this word is unclear, and I have not been able to find the form in the published literature.

(85) *Context: You were watching the Canucks and at one point in the first period they were up 2-1. At that point, they might have still won (but they didn't in the end).*

- a. k'ay **da'akxw**-diit *(dim) xstaa-diit, ii ap
 still CIRC.POSS-3PL.II *(FUT) win-3PL.II and EMPH
 nee=dii xstaa-diit
 NEG=CONTR win-3PL.II
 'They still could have won, but they didn't win.' (BS)
- b. **da'akhlxw**-diit dim xstaa-diit, ii nee=dii wil-diit
 CIRC.POSS-3PL.II FUT win-3PL.II and NEG=CONTR do-3PL.II
 'They could have won but they didn't.' (VG)

Da'akhlxw always obligatorily co-occurs with the future marker *dim*; this holds regardless of whether the temporal perspective is present or past, and can be verified by all the data in this section. The presence of *dim* correlates with an obligatory future temporal orientation, something which is often observed to hold for circumstantial modals, particularly possibility ones (cf. Werner 2006, Kratzer 2010, Vander Vate 2010, and, for the metaphysical subtype of circumstantial modality, Condoravdi 2002, Copley 2006). Having a future orientation means that *da'akhlxw* always makes a claim about a possible event subsequent to the time at which the modal claim is assessed. For example, an ability claim with a present temporal perspective entails that it is possible for the event to happen after the utterance time. This is shown in (86).

- (86) **da'akxw**[-i]-'y dim ayee=hl bax-'y
 CIRC.POSS[-TRA]-1SG.II FUT fast=CN run-1SG.II
 'I can run fast.' (BS)

Rejected in context: You were always a fast runner, but you have become permanently paralysed.

The final case to consider is *da'akhlxw* with a future *temporal perspective* – cases where the speaker makes a claim about a possibility which does not yet hold at the utterance time, but which will hold in the future. So far I have claimed that the (null) tense provides the temporal perspective for modals in Gitksan. This predicts that if we want a future temporal perspective with *da'akhlxw*, we will need 'double *dim*': first, the obligatory *dim* which gives future temporal orientation, and second, a higher *dim* which appears before *da'akhlxw* and moves the temporal perspective into the future. This is exactly what we find, as shown in (87).

- (87) *Context: He can't cook now, but he will be able to cook (after taking this cooking course).*

would say it. Sounds like a three-year-old.”

- (89) **anookxw**-diit *(dim) ha'wi-s Savanna
DEON.POSS-3PL.II *(FUT) go.home-PN Savanna
 ‘Savanna is / was allowed to go home.’
 (literally: ‘They allow(ed) Savanna to go home.’) (BS, VG)
- (90) **anoog**-i-s nox-s Savanna dim ha'wi-t gyu'un
DEON.POSS-TRA-PN mother-PN Savanna FUT go.home-3SG.II now
 ‘Savanna’s mother allows her to go home now.’ (BS)
- (91) ii-t **anook**-s nox-t dim ma'us-t galk
 and-3SG.II **DEON.POSS-PN** mother-3SG.II FUT play-3SG.II outside
 ‘And her mother let her play outside.’
 (BS, Totem Field Storyboard Collection, “Sick Girl”)
- (92) nee=dii-t **anook**=s naa'a dim ligi kw'ihl
 NEG=CONTR-3SG.II allow=CN Mum FUT INDEF about
 Amksiwaa-max-dii gosun
 whiteman-language-IMPERS LOC=this
 ‘Mama don’t allow no English-speaking ‘round here!’
 (Rigsby 1986:416)
- (93) ii nee=dii **anookxw** *(dim) xsaw-'y
 and NEG=CONTR **DEON.POSS** *(FUT) go.out-1SG.II
 ‘And I am not allowed to go out.’
 (BS, Totem Field Storyboard Collection, “Chore Girl”)

An embedded example is given in (94).

- (94) ii he-s Mary, “mahl-di-s noo-'y **anook**-t
 and say-PN Mary tell-TRA-PN mother-1SG.II **DEON.POSS-3SG.II**
 *(dim) ma'us-'y”
 *(FUT) play-1SG.II
 ‘And Mary said, “My mother told me I could play.”’
 (BS, Totem Field Storyboard Collection, “Chore Girl”)

We saw above that when permission is involved, *anook(xw)* is not the only option; the plain circumstantial *da'akhlxw* is possible as well. One example is repeated in (95).

- (95) mahl-di-s noox-'y **da'akhlxw**[-i]-'y dim ma'us-'y
 tell-TRA-PN mother-1SG.II **CIRC.POSS**[-TRA]-1SG.II FUT play-1SG.II
 ‘My mother told me I could play.’ (VG)

Summarizing this section, we have seen that in addition to the general circumstantial possibility modal *da'akhlxw*, there is a specialized deontic possibility modal *anook(xw)*. The temporal properties of *anook(xw)* match those for the other modals examined so far, namely that either a past or a present temporal perspective is possible. Like *da'akhlxw* but unlike the epistemic modals *ima('a)* or *gat*, *anook(xw)* obligatorily requires a future orientation and therefore obligatorily requires *dim*. Future temporal perspective is achieved via an additional *dim* preceding the modal.

4.3 Circumstantial (weak) necessity: *sgi*

Circumstantial necessity and weak necessity interpretations are rendered in Gitksan by the modal *sgi*, which obligatorily co-occurs with the future marker *dim*. Syntactically, *sgi* is a 'dependent marker'. It does not take its own pronominal endings, but the rest of the clause following it is in the dependent clause type (see Rigsby 1986:251ff., Tarpent 1987:224ff, and Hunt 1993: ch. 4 for discussion of clause types).

One of the most common uses of *sgi* is to express deontic necessity (obligation), as in (99-102). As predicted, either a past or a present temporal perspective is allowed; the obligation can either hold at the utterance time, or have held in the past.

- (99) **sgi** *(dim) ap ha'w-s Lisa
CIRC.NECESS *(FUT) EMPH go.home-PN Lisa
 'Lisa should go home.' / 'Lisa should have gone home.' (BS, VG)
- (100) **sgi** *(dim) ap ha'w-t wil ban=hl t'imges-t²⁷
CIRC.NECESS *(FUT) EMPH go.home-3SG.II COMP hurt=CN head-3SG.II
 'She should go home, she has a headache.' (BS)
- (101) **sgi** dim ha'w-s Lisa gi, wil ban=hl t'imges-t
CIRC.NECESS FUT go.home-PN Lisa DISTCOMP hurt=CN head-3SG.II
 'Lisa should have gone home, she had a headache.' (BS)
- (102) **sgi** dim-t sga'wa-sLisa=hl hlguuhlxwm gat-t
CIRC.NECESS FUT-3SG.II meet-PN Lisa=CN child man-3SG.II
 'Lisa should have met her son (he was all alone).' (BS)

Rigsby (1986) translates the combination *sgidim* as 'have to, must' and gives the following, deontic example:

²⁷ VG gives a similar sentence, but prefers *siipxwhl t'imgest* rather than *banhl t'imgest* for 'headache'.

- (103) **sgidim** t'aa=hl hanak' go'o=hl an-t'aa-t
have.to sit=CN woman LOC=CN place-sit-3SG.II
 'The woman has to, must sit in her reserved place.' (Rigsby 1986:379)

Sgi is also freely used for non-deontic circumstantial necessity readings, as in (104-106). Here, the speaker is saying that given the relevant facts, it should be the case that Bob is sick / the cake is ready / the grandmother is home. Both present and past temporal perspectives are possible: the modal claim is made based either on past information, or information which holds at the utterance time (as in (105)).

- (104) *Context 1: Bob ate bad chicken last night. He should be sick now.*
Context 2: Bob ate bad chicken last week. He should have been sick (but he was ok).

sgi *(dim) sim siipxw-t
CIRC.NECESS *(FUT) very sick-3SG.II
 'He should be very sick' / 'He should have been very sick.' (BS)

- (105) *Context: You have just walked into the house and see a cake in the oven. You find a note saying 'I put the cake in at 2:30. It takes half an hour to bake.' You look at your watch and see that it's 3pm. You say:*

sgi *(dim) hliisxw-t gyu'un
CIRC.NECESS *(FUT) finished-3SG.II now
 'It should be ready now.' (BS)

- (106) *Context: Your grandmother is a little forgetful. Your grandfather calls you on the phone.*

Grandfather: Where is your grandmother? She's not home yet.
You: I didn't even know she was out; she wasn't with me.
Where did she go?
Grandfather: She went bowling four hours ago, and she only bowls for an hour.
You: She should have got home long ago!

sgi dim 'yagay-t ligii 'witxw-t da'awhl
CIRC.NECESS FUT already-3SG.II INDEF arrive-3SG.II then
 'She should have got home long ago.' (BS)

Sgi also allows teleological (weak) necessity interpretations, as shown in (107-108) (adapted from von Fintel and Iatridou 2008), as well as bouletic interpretations, as in (109-110).

- (107) *Context: There is only one way to get to Whistler: Highway 99.*

NECESSITY

ji daa hasak-t dim yee-t goo=hl Whistler ii
 IRR ever want-3SG.II FUT go-3SG.II LOC=CN Whistler and
sgi *(dim)-t yuxw=hl genim 99
CIRC.NECESS *(FUT)-3SG.II follow=CN road 99
 ‘If he wants to go to Whistler, he has to take Highway 99.’ (BS)

- (108) *Context: There are two ways to get to Lillooet: 99 or 1. 99 is better.*

WEAK NECESSITY

ji daa dim yee-n goo=hl Lillooet ii **sgi** *(dim)
 IRR ever FUT go-2SG.II LOC=CN Lillooet and **CIRC.NECESS** *(FUT)
 yuxw=hl genim 99
 follow=CN road 99
 ‘If you go to Lillooet, you should take Highway 99.’ (BS)

- (109) **sgi** mi=dim bak=hl cake tun
CIRC.NECESS 2SG.III=FUT try=CN cake DEM
 ‘You should try this cake.’ (VG)

- (110) k’ap sim **sgi** mi=dim bak=hl cake tun
 EMPH really **CIRC.NECESS** 2SG.III=FUT try=CN cake DEM
 ‘You MUST try this cake.’ (VG)

Rigsby notes that *sgidim* ‘seems to be composed of *sgi* ‘lie, be in a lying position’²⁸ and the future marker *dim*, but suggests that it may have been reanalyzed as *sgit-im*. The latter suggestion would not account for (109-110) and (111), which show that the *sgi* and the *dim* may be separated by pronominal morphology:

- (111) nee=dii **sgi** mi=**dim** yo’oxs no’ohl
 NEG=CONTR **CIRC.NECESS** 2SG.I=FUT wash dishes
 ‘Don’t wash the dishes.’ (BS, VG)

With respect to whether the *sgi* which I am analyzing as a circumstantial necessity modal is the same element as the locational verb *sgi*, there are several ways to tell them apart, and it is clear that (at least synchronically) this is a case of homophony. See Appendix C for the argumentation.

Returning to the interpretations available for the modal *sgi*, my claim that it is a circumstantial (weak) necessity modal predicts that it cannot be used for possibility meanings, such as permission or ability. This is correct, as shown in (112) and (113) respectively. In (112), the consultant accepts the sentence in

²⁸ Tarpent (1987:59) also notes a Nisgha verb *sgi* meaning ‘(object) to be somewhere’.

the given context, but makes it clear that the permission interpretation is not what is meant.

(112) *Context: Savanna is in prison and she gets her parole.*

sgi dim ha'w-s Savanna gyu'un
CIRC.NECESS FUT go.home-PN Savanna now
 'Savanna should go home now.' (BS)

Consultant's comment: "Yeah, if she's already been passed by the parole board. The [version with *anook(xw)*] says she was allowed to go home. So now, she *should* go home."

(113) *Context: Henry took a cooking class.*

sgi dim jam-s Henry gyu'un
CIRC.NECESS FUT cook-PN Henry now
 'Henry should cook now.' (BS)

Elicitor: "Can this mean that he is able to cook now?"

Consultant: "He should cook now. Especially if it's salmon!"

There is one circumstantial necessity interpretation which *sgi* does not seem to instantiate, and that is pure circumstantial strong necessity: the sneeze case (see (5) above). In Gitksan, such sentences are expressed using a plain future, as shown in (114a), or by using *'nim* 'want', as in (114b).

(114)a. **dim** ha'jiswa-'y²⁹
FUT sneeze-1SG.II
 'I have to sneeze.' (BS, VG)

b. **'nim** ha'jiswa 'nii'y
want sneeze 1SG.III
 'I have to sneeze.' (BS)

The speakers do not like *sgi* in this context, as shown in (115).

(115) **sgi** dim ha'jiswa-'y
CIRC.NECESS FUT sneeze-1SG.II
 'I should sneeze.' (BS)

²⁹ One consultant prefers *dim ha'jiswa 'nii'y* here, using the independent order series III pronoun. There is a certain amount of flexibility in when dependent and independent order pronouns may be used; see Rigsby (1986), Tarpent (1987) and Hunt (1993) for discussion.

Consultant's comment: "Sgidim says I should sneeze. You wouldn't say it if you just mean you have to sneeze because you have something in your nose."

The same effect, namely a circumstantial necessity modal not being felicitous in the sneeze case, is also observed for St'át'imcets by Davis et al. (2009). They point out that even in English, the use of *must* here is marginal (although for some reason *have to* is fine), and postulate that the infelicity of necessity circumstantial modals in these cases results from an interference from the plain future (see their paper for details). Their analysis correctly predicts that in St'át'imcets, if we place a sneeze case into the past, or the habitual aspect, the circumstantial necessity modal becomes felicitous. However, in Gitksan even these measures do not suffice to license *sgi*, as shown in (116-118). In each case, the consultants volunteer sentences without *sgi*. When asked about a version with *sgi* in, as in (116b) or (118b), they indicate that the sentence does not have the intended meaning.

(116)a. 'yim-i-s Gertie=hl *pepper* ts'im ts'ak-t ii
 sniff-TRA-PN Gertie=CN pepper inside nose-3SG.II and
 'nim/dim ha'jiswa-t
 want/FUT sneeze-3SG.II
 'Gertie got pepper in her nose and she had to sneeze.' (VG)

b. 'yim-i-s Gertie=hl *pepper* ts'im ts'ak-t ii
 sniff-TRA-PN Gertie=CN pepper inside nose-3SG.II and
 sgi dim ha'jiswa-t
 CIRC.NECESS FUT sneeze-3SG.II
 'Gertie got pepper in her nose and she should sneeze / should have sneezed.' (BS, VG)

(117) xsit 'niiy hlis 'naa gup=hl loga hon
 vomit 1SG.III finish complete eat=CN rotten fish
 'I had to throw up after eating that rotten fish.' (BS, VG)

(118)a. ts'ahlx nii'y goo Gitxsanimx-s Lisa
 laugh 1SG.III LOC Gitxsanimx-PN Lisa
 'I have to laugh when I hear Lisa try to speak Gitxsanimx.' (BS)

b. **sgi** dim ts'ahlx-y goo Gitxsanimx-s Lisa
CIRC.NECESS FUT laugh-1SG.II LOC Gitxsanimx-PN Lisa
 'I should laugh whenever Lisa speaks Gitxsanimx.' (BS)

It is not yet clear why the sneeze-type cases are bad in Gitksan with *sgi*, even when in the past or in the habitual. Two possible explanations come to mind. The first, suggested by Peterson (2011), is that *sgi* is only a *weak* necessity modal, and strong necessity interpretations are best rendered with a

plain future. Some support for this comes from the fact that the preferred translation for *sgi* is ‘should’, which is a weak necessity modal in English. However, notice above that in the strong necessity cases in (107) and (110), *sgi* is volunteered. Notice also that a strong necessity, apparently pure circumstantial, use of *sgi* is felicitous in (119):

- (119)a. *k*'ap **sgi** dim gwalga³⁰ daxw-'m
 EMPH CIRC.NECESS FUT all die.PL-1PL.II
 ‘We must all die.’ (VG)
- b. ap **sgi** dim ap 'walga di-daw-'m
 EMPH CIRC.NECESS FUT EMPH all PL-die.PL-1PL.II
 ‘We must all die.’ (BS)

The reason for the infelicity of *sgi* in some cases of circumstantial necessity does not seem to be an issue of modal strength. It seems more likely that it is an issue of type of modality. Perhaps *sgi* requires a priority interpretation (i.e., it requires a non-empty ordering source), but further investigation is required.

Sgi can co-occur with other modals; examples are given in (120-122). Notice that each modal takes its own *dim*, if it requires it due to being circumstantial.³¹

- (120) nee=dii wan=hl maa'y go'osun, ii ap **sgi**
 NEG=CONTR sit=CN berries here and EMPH CIRC.NECESS
 dim **da'akhlxw** dim wan-t
 FUT CIRC.POSS FUT sit-3SG.II
 ‘There are no berries here, but they should be able to grow here.’ (VG)
- (121) **sgi=imaa** dim ha'w-s Lisa gi (wil ban=hl
 CIRC.NECESS=EPIS FUT go.home-PN Lisa DIST (COMP hurt=CN
 t'imges-t)
 head-3SG.II)
 ‘She should have maybe gone home (she had a headache).’ (BS)
- (122) **sgi=imaa** dim-t sga'wa-s Lisa=hl hlguuhlwxm gat-t
 CIRC.NECESS=EPIS FUT-3SG.II meet-PN Lisa=CN child man-3SG.II
 ‘Lisa maybe should have fetched her son.’ (BS)

With regard to the temporal properties of *sgi*, we have seen that like all

³⁰ My consultants pronounce the word for ‘all’ differently from each other. I cannot find this lexical item in Hindle and Rigsby (1973), Rigsby (1986) or Tarpent (1987); Hunt (1993) spells it *'walga*.

³¹ Other modals can also co-occur, as for example in (i).

- (i) yugw=**imaa-t** **da'akxw-i-s** Henry=hl jam
 PROG=EPIS-3SG.II CIRC.POSS-TRA-PN Henry=CN cook
 ‘Perhaps Henry knows how to cook.’ (BS)

the other modals, *sgi* allows both past and present temporal perspectives. Like the other circumstantial modals, *sgi* always co-occurs with the future marker *dim*, and this correlates with a future orientation. If an obligation is imposed, for example, it is an obligation to do something after the time at which the obligation is imposed.³²

As with the other circumstantial modals, we predict double *dim* in cases of future temporal perspective (e.g., cases where an obligation will arise in the future). The prediction is upheld, as shown in (123).

(123) *Context: Your son is going to military school. You are telling him that things are going to change; he's going to have to get up early.*

dim sgi dim hlookx 'niin hlaa dim suwilaaks-'n
 FUT CIRC.NECESS FUT early 2SG.III INCEPT FUT learn-2SG.II
 go'o=hl military
 LOC=CN military
 'You will have to get up early when you go to military school.' (VG)

5 Conclusions and future research

In sections 3 and 4 we have seen evidence for the following categorization of Gitksan modals:

(124)

		POSSIBILITY	(WEAK) NECESSITY
CIRCUMSTANTIAL	PLAIN	<i>da'akhlxw</i>	<i>sgi</i>
	DEONTIC	<i>anook(xw)</i>	
EPISTEMIC	PLAIN	<i>ima('a)</i>	
	REPORTATIVE	<i>gat</i>	

Gitksan lexically encodes both modal strength and type of modality, possessing two purely epistemic modals (following Peterson 2010), a general circumstantial possibility modal, a deontic possibility modal, and a (weak) necessity circumstantial modal. Gitksan is thus a 'mixed' system: it encodes modal strength distinctions only within the circumstantial domain.

In the remainder of the paper I will outline some theoretical questions raised by the Gitksan results reported on here, as well as some further empirical issues.

³² Not *all* circumstantial modals have future orientations, cross-linguistically. As mentioned above, some modals display actuality entailments, and these are not future-oriented; the ability coincides temporally with the actual event (see Hacquard 2006). I return briefly to this in section 5.

5.1 Plain *dim*: modal or not?

I have been assuming that the future marker *dim* is analogous to Abusch's (1985) WOLL predicate, in that it co-occurs with a (null) tense marker rather than itself being a tense. This makes correct temporal predictions, including for example that future-in-the-past readings will be possible for *dim*; see Jóhannsdóttir and Matthewson (2007), Matthewson (2011). However, the question arises as to whether *dim* expresses modality as well as temporal ordering (like, for example, most people's analysis of English *will/would*). In Matthewson (2011, in prep.) I propose that *dim* is non-modal, but Peterson (2011) argues that *dim* is modal. Initial evidence in support of Peterson's proposal comes from deontic uses of *dim*, as shown in (125-128).³³

(125) **dim** ha'w 'niin ji gyu'un
 FUT leave 2SG.III IRR now
 'You have to leave now.' (BS)

(126) *Context: I tell you that Bob stole a book from the store.*

dim ap guuxs mak-di-s Bob
 FUT EMPH back give-TRA-PN Bob
 'He has to give it back.' (BS)

(127) *Context: According to the laws of the feast hall ...*

dim ts'ilayxw-i-n=t Mary
 FUT visit-TRA-2SG.II=PN Mary
 'You will/must go visit Mary.' (Peterson 2011)

(128) *Context: John's friends ask if John can stay out past his 10pm curfew, set by his father, but John's father replies:*

dim t'a=t John
 FUT at.home=PN John
 'John must be at home.' (Peterson 2011)

A non-modal analysis of *dim* would have to claim either that there is a null modal element in (124-128), or that these sentences really only make predictions, rather than true deontic claims. Further research is required.

5.2 The (absence of) inherent future orientation for modals

Recall that Gitksan epistemic modals cannot be future-oriented without

³³ Rigsby (1986) and Tarpent (1987) also give many examples of *dim*-sentences translated into English as imperatives.

the presence of *dim*; this holds even for stative predicates, as shown in (50) above, repeated here.

- (129) yugw=**imaa**=hl siipxw-t
 IMPF=**EPIS**=CN sick-3SG.II
 ‘He might be sick (now) / He might have been sick.’
 ≠ ‘He might be sick (in the future).’ (BS, VG)

These data differ from English, and suggest that we need a semantics for Gitksan epistemic modals which is not inherently future-oriented, unlike English *might* as analyzed by Condoravdi (2002).

Circumstantial modals in Gitksan also have the potential to shed light on the correct analysis of the temporal interpretation of modals. Many authors have observed the preference for circumstantial modals to be future-oriented (see for example Kratzer 2010); this future-orientation could be either built into the lexical entry of the modal itself (Enç 1996, Abusch 1998), or it could come for free from general mechanisms (Werner 2006, and for metaphysical modality, Condoravdi 2002, Copley 2006). (See Portner (2009:230ff.) for an overview.) The Gitksan data seem to support an analysis whereby the futurity comes not from the modal itself, but rather from the temporal ordering predicate *dim*. Gitksan would then be an overt spell-out of an analysis independently proposed for English by Kratzer (2011), according to which a null prospective aspect which can co-occur with circumstantial modals provides the future orientation (and removes actuality entailments). Note that although I have been calling *dim* a future marker, in a technical sense it is a prospective aspect, because it orders the reference time with respect to the event time (see fn 5).

Here as well, however, there is a competing analysis, sketched by Peterson (2011). If *dim* is itself modal, then we could say that the elements which I have been calling modals instead merely provide the modality type (the ordering source, in a Kratzerian analysis). *Dim* would then contain both modality (quantification over possible worlds) as well as futurity. The empirical differences between these two ideas are subtle, and future research is required.

5.3 The irrealis marker *ji*

Throughout section 4, I claimed that circumstantial modals in Gitksan obligatorily require *dim*. Some refinement of this claim is required. Firstly, while neither of my consultants have ever volunteered a circumstantial modal without *dim*, one of my consultants (VG) occasionally does accept *dim*-less circumstantial modals. (The other consultant never does.) Perhaps more interestingly, some modal constructions allow the substitution of the irrealis marker *ji* for *dim*. This is illustrated in (130-131), which consultants accept but so far have not volunteered in my data.

- (130) **sgi** **ji-t** sga'wa-s Lisa=hl hlguuhl xwm gat-t
 CIRC.NECESS IRR-3SG.II meet-PN Lisa=CN child man-3SG.II
 'Lisa should have fetched her son.' (BS)
- (131) **anookxw**-diit **ji** ha'w-s Savanna
 DEON.POSS-3PL.II IRR go.out-PN Savanna
 'Savanna is allowed to go out.' (BS)

The *ji* constructions are definitely not the preferred way to express circumstantial modality, and *ji* is not always substitutable for *dim* under modals, as shown in (132-133).

- (132) * **anookxw** **ji** ha'w-s Savanna k'yoots
 DEON.POSS IRR go.home-PN Savanna yesterday
 'Savanna was allowed to go home yesterday.' (BS)

Consultant's comment: "No *ji*. *K'yoots* and *ji* don't jibe."

- (133) ? ii nee=diin **da'akxw** **ji** xsaw-'y
 and NEG=CONTR DEON.POSS IRR go.out-1SG.II
 'And I am not able to go out.' (BS)
- (134) * yugw=**imaa** **ji** wis
 PROG=EPIS IRR rain
 'It might be going to rain.' (BS)

My proposal that *dim* normally provides the future-orientation of circumstantial or epistemic modals, and that this future orientation is not intrinsic to the modal itself, may require me to assume that *ji* also contains future semantics. This is not completely implausible, but more work is required.³⁴ (See Tarpent 1987:466-471 for discussion of *ji*.)

5.4 Syntax

I have largely ignored matters of syntax in this paper. One interesting question concerns whether Gitksan modals can shed any light on the debate about whether modals display syntactic differences which correlate with interpretive differences (cf. Brennan 1993, Bhatt 1998, Wurmbrand 1999, Lechner 2005, Hacquard 2006, among others). For example, it has often been argued that epistemic modals sit higher in the tree than most circumstantial ones, and that epistemic modals take an entire proposition in their scope, while some circumstantial ones are relativized to individuals. For Gitksan, there is

³⁴ *Ji* cannot function on its own as a future marker, as shown by the contrast in (i).
 (i) **dim**/***ji** yookxw-t James t'aahlakxw
 FUT/*IRR eat-3SG.II James tomorrow
 'James will eat tomorrow.' (BS)

suggestive evidence that some version of these proposals might be on the right track. The epistemic modals are second-position clitics, hence plausibly take scope over the entire proposition, whereas *da'akhlxw* is a verb which usually takes an individual subject argument (cf. (63), (67), (69)). As noted above, however, *da'akhlxw* sometimes seems to appear in an impersonal construction, taking the entire proposition as its argument (cf. (62), (80), (81)). So far, no interpretive differences have been detected between the different structures with *da'akhlxw*; further research is required.

Appendix A: Hindle and Rigsby orthography and abbreviations

Orthography

Orth.	IPA	Orth.	IPA	Orth.	IPA	Orth.	IPA	Orth.	IPA
a	a	hl	ɬ	l	l	s	s	x	x
aa	a:	i	ə	'l	l'	t	t	<u>x</u>	χ
b	b	ii	i:	m	m	t'	t'	xw	x ^w
d	d	j	ɟ	'm	m'	tl'	ʎ'	y	y
e	e	k	k	n	n	ts	ts	'y	y'
ee	e:	k'	k'	'n	n'	ts'	ts'	'	?
g	g	<u>k</u>	q	o	o	u	u		
<u>g</u>	G	<u>k'</u>	q'	oo	o:	uu	u:		
gw	g ^w	kw	k ^w	p	p	w	w		
h	h	kw'	k ^w '	p'	p'	'w	w'		

Note: Velar and uvular (unrounded) stops are palatalized before any vowel other than (long or short) *o* or *u*, so this palatalization is not written in the orthography (Rigsby 1986:123). For example, the *g* is actually pronounced [g^y] in both (i) and (ii):

(i) gyu'un 'now'

(ii) gat 'man'

Abbreviations

ATTRIB = attributive	IMPERS = impersonal
AX = agent extraction	INCEPT = inceptive
CAUS = causative	INDEF = indefinite
CIRC = circumstantial modal	INSTR = instrumental
CN = connective	IRR = irrealis
CNN = connective	LOC = locative
COMP = complementizer	NECESS = necessity
CONTR = contrastive	NEG = negation
DEM = demonstrative	PART = particle
EMPH = emphasis	PN = proper noun
EPIS = epistemic modal	POSS = possibility

FUT = future	PROG = progressive
I = series I pronoun	PV = pre-verb
II = series II pronoun	REPORT = reportative
III = series III pronoun	TRA = transitivizer

Appendix B: Pronunciation differences

English gloss	Rigsby (1986) / Hindle & Rigsby (1973)	My consultants
tomorrow	t'aahlakw	t'aahlakxw
cut	k'oj-i	k'oj-a
go out	xsaxw	xsaw (BS only)
locative	go'o	goo (BS only)
sneeze	hat'iswa	ha'jiswa
die (pl)	daxw	daw (BS only)
early	hlook	hlookx

Appendix C: The two *sgis*

The first distinction between the two *sgi*'s is semantic: the modal *sgi* has circumstantial necessity readings, while the verb *sgi* has locational or possession readings; the latter are illustrated in (1).

- (1) a. **sgi**=lh ha-'nii-t'aa loo-t
lie=CN INSTR-in-sit OBL-1SG.II
 'He/she has a chair.' (BS; elicited by Henry Davis)
- b. ee'e, **sgi**=hl gwila-'y
 yes **lie**=CN blanket-1SG.II
 'Yes, I have a blanket.' (Rigsby 1986:298)

The second way to tell the two *sgi*'s apart is that only the location/possessive one has a suppletive plural form (Rigsby 1986:76). This is shown in (2), which contains the suppletive plural, vs. (3), which shows that the modal *sgi* does not turn to *dox* in the plural.

- (2) **dox**=hl ha-'nii-wan loo-'m³⁵
lie.PL=CN INSTR-in-sit.PL OBL-1PL.II
 'We have chairs.' (BS)

³⁵ VG prefers *ha'nii't'aa* here for 'chair'; he reserves *ha'niivan* for 'floor' (cf. Hindle and Rigsby 1973:23).

(3) *Context: You were watching the Canucks and at one point in the first period they were up 2-1. They should have still won (but they didn't in the end).*

a. **sgi** dim xstaa-diit, ii nee=dii wil-diit
 CIRC.NECESS FUT win-3PL.II and NEG=CONTR do-3PL.II
 'They should have won, and they didn't.' (BS, VG)

b. * **dox** dim xstaa-diit, ii nee=dii wil-diit
 lie.PL FUT win-3PL.II and NEG=CONTR do-3PL.II
 'They should have won, and they didn't.' (BS, VG)

The third distinction between the two *sgi*'s is that only the modal *sgi* obligatorily co-occurs with *dim*. (1) and (2) show that location/possession *sgi/dox* does not require the presence of *dim*.

As predicted by the claim that there are two homophonous *sgis*, they can co-occur, as shown in (4).

(4) **sgi** dim **sgi**=hl ha'nit'aa loo-'y
 CIRC.NECESS FUT **lie**=CN INSTR-in-sit OBL-1SG.II
 'I should have a chair.' (BS, VG)

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