

What questions, conditionals, uncertainty, and falsity share in Gitksan

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Abstract: The morpheme *ji* in Gitksan introduces a subordinate clause in a wide range of environments including conditional antecedents, embedded polar questions, and some declarative complements (Aonuki to appear, Brown 2025, Gogag, Hill & Sennott in prep, Hunt 1993, Matthewson 2026, Rigsby 1986). The distribution of *ji* is yet to receive a unified semantic analysis. Based on novel data on the interaction of *ji* with disjunction in conditional antecedents and embedded questions, this paper argues that *ji* forms a singleton set containing its propositional argument *p* and at the same time places a restriction on the status of *p* in the context set of a relevant thought or speech eventuality.

Keywords: *disjunction, conditionals, questions, attitude reports, Tsimshianic, Gitksan*

1 Introduction

A morpheme *ji* in Gitksan (Aonuki to appear, Brown 2025, Gogag, Hill & Sennott in prep, Hunt 1993, Matthewson 2026, Rigsby 1986), introduces embedded polar questions (1) and conditional antecedents (2), as do its cognates *ji/ja* in Nisga'a (Tarpent 1987) and *dzi* in Sm'algyax (Brown 2022, 2023, 2024, 2026, Sasama 2001).

- (1) Gidax-a-[-t]=s Lisa 'nii'y [***(ji)**] 'witxw-i'y go'osun ky'oots]
ask-TR[-3.II]=PN Lisa 1SG.III *ji* arrive-1SG.II here yesterday
'Lisa asked me if I came here yesterday.' (VG-v., HH; Aonuki to appear:1(1))¹
- (2) Context: "Where is Prof. X?"
[***(ji)**] nee=dii wil-t goo[-t]=hl pdo'o-t] yukw=t si-wilaay[-t]=hl git
ji NEG=FOC LVB-3.II LOC[-3.II]=CN room-3.II PROG=3.I CAUS-know[-3.II]=CN people
'If he's not in his room, he is teaching.' (VG-v.)

At the same time, *ji* has an optional occurrence in declarative attitude complements when the attitude holder is uncertain (3) or wrong (Aonuki to appear, Gogag, Hill & Sennott in prep, Hunt 1993), and similar patterns are reported for *dzi* in Sm'algyax (Brown 2022, 2023).

- (3) Context: Lisa was sick last week.
 Bisxw-i'y [(ji) am wila he[-t]=s Lisa gyuu'n]
 hope-1SG.II ji good MANR say[-3.II]=PN Lisa now
 'I hope Lisa is feeling better now.' (VG; Aonuki to appear:3(8))

In this paper, in order to narrow down the hypothesis space for the semantic contribution of *ji*, I expand the empirical scope to disjunction. I will argue that *ji* takes a proposition *p* and returns a singleton set containing it, while also constraining the status of *p* in the context set of some speech or thought eventuality. In the remainder of the paper, Section 2 introduces the language, and Section 3 and 4 provide data on *ji* in embedded polar questions, conditional antecedents, and declarative complements, most of which are also reported in Aonuki to appear. In Section 5, I discuss novel data on the interaction of *ji* with disjunction, and motivate a unified analysis of the contribution of *ji* in the environments discussed in Section 3-5. Section 7 provides a formal account, and Section 8 concludes.

2 Language background

Gitksan belongs to the Tsimshianic language family, and constitutes the Interior Tsimshianic branch along with Nisga'a. It is spoken in northern British Columbia, Canada, and it is reported to have 255 fluent speakers as of 2022 (Gessner, Herbert & Parker 2022). The word order is VSO (Rigsby 1986), and the language is morphologically tenseless (Aonuki 2021, Jóhannsdóttir & Matthewson 2008). Unless otherwise noted, data reported in this paper come from my fieldwork with Vincent Gogag (VG) and Hector Hill (HH).

3 Obligatoriness of *ji* in embedded PolQs and conditional antecedents

Obligatoriness of *ji* in embedded polar questions was seen in (1), involving a rogative verb *gidax* 'ask.' The same holds for a responsive verb like *mehl* 'tell' (4). Having *ji* in the complement clause gives rise to a polar question reading (4a), while having a declarative complementizer *win* or no overt material in place of *ji* gives rise to a declarative interpretation (4b).

- (4) Context: John is a huge Canucks fan. Their game should have finished by now but John forgot his phone and can't check the results. His friend says:
 a. Mehl-d-i[-t]=hl ligi=t naa loo-'y [(ji) xsdaa[-t]=hl Canucks]
 tell-T-TR-[3.II]=CN ligi=PN who OBL-1SG.II ji win[-3.II]=CN Canucks
 'Someone told me **whether** the Canucks won.' (VG-v.)

¹“-v.” following a speaker initial indicates that the sentence was volunteered by the speaker. Moreover, “(α)” in an example sentence indicates that the version without α was tested and accepted, while a lack of brackets simply indicates lack of data about whether α is required.

- b. Mehl-d-i[-t]=hl ligi=t naa loo-'y [(win) xsdaa[-t]=hl Canucks]
 tell-T-TR-[3.II]=CN ligi=PN who OBL-1SG.II COMP win[-3.II]=CN Canucks
 'Someone told me **that** the Canucks won.' (VG)
 (Aonuki to appear:2(6))

Similarly, a version of (2) without *ji* (5) lacks a conditional reading.

- (5) Context: "Where is Prof. X?"
 *[Nee=dii wil-t goo[-t]=hl pdo'o-t] yukw=t si-wilaay[-t]=hl git
 NEG=FOC LVB-3.II LOC[-3.II]=CN room-3.II PROG=3.I CAUS-know[-3.II]=CN people
 intended: 'If he's not in his room, he is teaching.'
 actual: 'He is not in his room. He is teaching.' (VG)

For the cognate *dzi* in Sm'algyax, Brown takes its occurrence in embedded polar questions as evidence that *dzi* is an interrogative complementizer, which takes a proposition *p* and returns $\{p\}$ (Brown 2024) or $\{p, \neg p\}$ (Brown 2026). The interrogative complementizer analysis is consistent with the Gitksan data presented so far; use of the same morpheme in embedded polar questions and conditional antecedents is a cross-linguistically observed phenomenon, as also seen with *if* in English (e.g., Bhatt & Pancheva 2006; Starr 2014). However, the analysis is challenged by occurrences of *ji* in complements of anti-rogative verbs (Section 4).

4 *Ji* in declarative complements: Uncertainty and falsity

In addition to *bisxw* 'hope' (3), *ji* is also allowed under *ha'niigoot* 'think' if the attitude holder is uncertain, as seen in the contrast between (6a) and (6b).

- (6) a. Context: Today is Thursday, and Henry usually comes to the department on Thursday.
 b. #Context: Henry told me yesterday that he would come to the department today for sure.
 Ha'niigood-i'y [(ji)² dim 'witxw[-t]=s Henry sa tun]
 think-1SG.II ji PROSP arrive[-3.II]=PN Henry today
 'I think Henry will be here today.' (VG; Aonuki to appear:3(7),(9))

Ji is also allowed and often volunteered by the consultants when the speaker knows the complement proposition to be false. (7) illustrates it with a third person subject's present attitude, and (8) with the speaker's past attitude.

- (7) Context: Someone comes in and says "I'm looking for Miss. Davis." (Referring to Henry Davis).
 Ha'niigoot-t [(ji) hanak[-t]=s Henry]
 think-3.II ji woman[-3.II]=PN Henry
 'He thinks that Henry is a woman.' (HH-v., VG-v.; Aonuki to appear:3(11))³

²To be more accurate, without *ji*, the clause should be preceded by a connective =hl, as in *Ha'niigood-i'y=hl [...]*. This applies to other cases in which *ji* is marked as optional after the predicate *ha'niigoot* 'think.'

- (8) Context: Yurika runs into Lisa after being told she left already, and says to her:
 Ha'niigood-i'y [ji ha'w-in]
 think-1SG.II ji go.home-2SG.II
 'I thought that you left.' (HH-v.; Aonuki to appear:3(10))

Against this background, I will present novel data on the occurrences of *ji* in conditional antecedents and embedded questions with disjunction. I will argue that even in embedded questions, *ji* is not an interrogative complementizer.

5 Disjunction

5.1 General purpose disjunction *oo ligi*

Before we look at the semantic contribution of *ji* in disjunction, some discussion of disjunction in the language is necessary. Gitksan has a category- and rogativity- neutral disjunction strategy *oo ligi* (see also Bicevskis, Davis & Matthewson 2017, Forbes 2013, Matthewson 2014). *Oo ligi* is volunteered in translations of conditional antecedents (9) and embedded questions (10) with disjunction.

- (9) Context: To a coworker who looks unwell:
 [Ji siipxw-in oo *(ligi) hlabixsxw-in] sgi dim ha'w-in
 ji sick-2SG.II oo ligi tired-2SG.II CIRC.NECESS PROSP go.home-2SG.II
 'If you are sick or tired, you should go home.' (VG-v.)
- (10) Context: John arrived earlier than Mary expected. Mary: "You were so fast! Did you walk, or did you run?"
 Gidax-a[-t]=s Mary=t John [ji yee-t oo *(ligi) bax-t]
 ask-TR[-3.II]=PN Mary=PN John ji walk-2.II oo ligi run-3.II
 'Mary asked John if he walked or ran.' (VG-v.)

Unlike *ji*, *oo ligi* is not limited to subordinate clauses nor clausal complements; (11) shows *oo ligi* used in sub-clausal, non-interrogative disjunction in a matrix clause.

- (11) Context: Children are treasure hunting after their father hid a treasure. They can't find the treasure for a long time, so the father gives them a hint.
 Gahlaxw[-t]=hl ha'niitxookxw oo *(ligi) ha'niit'aa
 under[-3.II]=CN table oo ligi chair
 'It's under the table or a chair.' (VG-v.)

Ligi is often judged obligatory in disjunction, as seen in (9)-(11) above. I will treat *oo ligi* as a non-decomposable lexical item. This is because, while *ligi* usually gives rise to ignorance or indifference inferences outside of disjunction (Bicevskis, Davis & Matthewson 2017 on *ligi* with indeterminate *wh* elements; Aonuki 2022 on *ligi* in translations of *ever*-free relatives), such inferences are absent (or at least not obligatory) in disjunction. This is evident in (11):

³Both HH and VG volunteered the version with *ji*. The version without *ji* was judged and accepted by VG.

ligi is obligatory, even though the context is constructed so that ignorance and indifference inferences are ruled out.

Concretely, I analyze *oo ligi* as a Junction head (den Dikken 2006) that takes two elements of the same semantic type and returns a set containing only those elements (12).

$$(12) \quad \llbracket X_\alpha \text{ oo } \text{ligi } Y_\alpha \rrbracket = \{X, Y\}$$

5.2 *Ji* in disjunction

It turns out that disjunction can be achieved without *ligi* in conditional antecedents (13) and embedded questions (14) if *ji* is present in each disjunct.

(13) Context: As in (9).

[**Ji** siipxw-in oo ***(ji)** hlabixsxw-in] sgi dim ha'w-in
 ji be.sick-2SG.II oo ji be.tired-2SG.II CIRC.NECESS PROSP go.home-2SG.II
 'If you're sick or if you're tired, you should go home.' (VG)

(14) Context: As in (10).

Gidax-a[-t]=s Mary a[-t]=s John [**ji** yee-t oo ***(ji)** bax-t]
 ask-TR-[3.II]=PN Mary PREP[-3.II]=PN John ji walk-3.II or ji run-3.II
 'Mary asked John if he walked or if he ran.' (VG)

The distribution of *ji* in disjunction provides a clue for its semantic contribution. Both conditional antecedents with disjunction and alternative questions have been analyzed as denoting a set of propositions contributed by each disjunct (e.g., Alonso-Ovalle 2006, Biezma & Rawlins 2012, Meertens 2021, Rawlins 2013, Uegaki 2018). Moreover, the fact that *ji* is required in each disjunct in (13)-(14) suggests that *oo* alone cannot achieve a set union. I propose that this is because the contribution of *oo* is to take two sets as arguments and return their union. The role of *ji* is to take a proposition *p* and return a singleton set $\{p\}$, which can then be an argument to *oo*. The proposal that *ji* returns a singleton set of propositions follows Brown's (2024) proposal for a cognate *dzi* in Sm'algyax. However, unlike Brown 2024, I will argue in the next section that *ji* is not an interrogative complementizer.

6 Motivating a unified analysis

If the semantic contribution of *ji* is to simply form a singleton set of propositions, it is not immediately clear why *ji* has optional occurrences in declarative complements. Nevertheless, there are three reasons to attempt a unified analysis of *ji* in embedded questions and conditional antecedents on the one hand and declarative complements on the other.

First, use of the same morpheme for questions and uncertainty is also observed in unrelated languages. Erlewine 2025 reports that while a disjunction morpheme *háishi* in Mandarin usually occurs in interrogative contexts, it also appears in non-interrogative disjunction with an uncertainty inference. Similarly, a Q-particle *ka* in Japanese appears in 'think' complements with a 'hedging' effect (Goodhue & Shimoyama 2022).⁴ In addition, the idea that there is a

⁴Though see Mizuno 2021 for a distinct treatment of this use of *ka*.

connection between questions and epistemic possibilities is found in previous works on alternative questions (Biezma & Rawlins 2012, Meertens 2021) as well as Inquisitive Semantics. (e.g., Ciardelli, Groenendijk & Roelofsen 2018).

Second, a cognate *dzi* in Sm'algyax also appears in declarative complements (Brown 2022, 2023), and Brown 2023 characterizes the associated discourse contexts as “the speaker likely no longer believes the embedded clause [...] to be true” or “the speaker does not know if the embedded clause is true” (6). Similar distributions and discourse effects observed with *ji* in Gitksan and *dzi* in Sm'algyax make it less likely that their occurrences in questions and conditionals on the one hand and declarative complements on the other are two independent lexical items with accidental homophony.

Third, there is evidence that even in embedded questions, *ji* is not an interrogative complementizer. A background to my discussion is an ongoing debate about whether an alternative question (AltQ) is a disjunction of two polar questions (PolQs) (Pruitt & Roelofsen 2011, Roelofsen & Van Gool 2010, Uegaki 2014) or not (Meertens 2021). One of the arguments for an AltQ being a disjunction of PolQs is that disjunction of *whether* clauses forces an AltQ interpretation (15).

- (15) I want to know whether Sally brought wine or whether she brought juice.
(Pruitt & Roelofsen 2011:7(9))

If *ji* was an interrogative complementizer, we would expect that disjunction of two *ji* clauses would similarly force an AltQ interpretation. However, such constructions are accepted even when there is an explicit contrast between AltQ and PolQ interpretations of an embedded question so that only the latter is supported by the context. (16) shows that disjunction of *ji* clauses is accepted under a rogative verb *gidax* ‘ask’ (16a) and a responsive verb *mehl* ‘tell’ (16b) in a context that supports a PolQ “Did you (either) make a dress or buy a book?” but not an AltQ that asks which of the two things the mother did.

- (16) Context: Mary says to her mom, “For my birthday, I want a handmade dress or a book. But don’t tell me which one I will get until I open the present. I want it to be a surprise.” The day before her birthday, Mary says to her mom, “I just want to know if we’re ready for my birthday party tomorrow. **Don’t tell me what you prepared, but did you prepare one of the things I mentioned? I mean, did you make a dress or buy a book?**” Her mom assures her, “Yes. Don’t worry.”

- a. *Gidax*[-t]=s Mary=t nox-t ji=t jap[-t]=hl nak oo ji=t
ask[-3.II]=PN Mary=PN mother-3.II ji=3.I make[-3.II]=CN dress oo ji=3.I
giikw[-t]=hl ha’niilitsxxw
buy[-3.II]=CN book
‘Mary asked her mother if she made a dress or bought a book.’ (VG)
- b. *Mehl*-d-i[-t]=hl nox-t loo[-t]=s Mary ji=t jap[-t]=hl nak oo
tell-T-TR[-3.II]=CN mother-3.II OBL[-3.II]=PN Mary ji=3.I make[-3.II]=CN dress oo
ji=t giikw[-t]=hl ha’niilitsxxw
if buy[-3.II]=CN book
‘Her mother told Mary if she made a dress or bought a book.’ (VG)

Similarly, in (17), the context supports a PolQ “Did you (either) touch animals or bring meat” but not an AltQ that asks which of the two things the addressee did.

- (17) Context: At the airport security, coming back from overseas. A traveler needs to fill out a customs form but forgot her glasses, so an airport worker is helping her by reading out the questions. One of the questions says: “**Did you touch animals or bring meat? Yes/No**”

Gidax-a-t 'niin ji ma-das[-t]=hl jagwasxw oo ji ma=di'witxw[-t]=hl smax
ask-TR-3.II 2SG.III ji 2SG.I-touch[-3.II]=CN animals oo ji 2SG.I-bring[-3.II]=CN meat
'It asks you if you touched animals or brought meat.' (VG)

The fact that disjunction of two *ji* clauses can be interpreted either as an AltQ or a PolQ suggests that the distinction between the two readings is made later in the semantic composition than formation of disjunction, and that *ji* cannot be an interrogative complementizer. Having shown that *ji* is not an interrogative complementizer even in embedded questions, the next section presents a formal proposal for what *ji* contributes in interrogative and declarative attitude complements as well as conditional antecedents.

7 Analysis

I propose that, in addition to returning a singleton set of propositions $\{p\}$, *ji* contributes a post-supposition regarding the relationship of p to the context set of some speech or thought eventuality. Concretely, I adopt Schlenker's (2008) idea of a 'context set' of a speech or thought eventuality: the context set of a thought eventuality is a doxastic modal base, while that of a speech event is the (reported) discourse context.⁵

The denotation of *ji* is given in (18). *ji* takes a proposition p and returns a singleton set $\{p\}$; it has a post-supposition that the context set of the eventuality assigned to the index e , $cs(g(e))$, does not entail p . That is, after an utterance of the sentence containing *ji* p , either p is false in all worlds in $cs(g(e))$ or an open issue in $cs(g(e))$.

$$(18) \quad \llbracket ji_e p \rrbracket^g = \{p\} \quad \text{Defined only if } cs(g(e)) \not\subseteq p \text{ [Post-supposition]}$$

The post-supposition of *ji* is similar to Glass's (2023) post-suppositional analysis of a belief verb *yǐwéi* in Mandarin. While *yǐwéi* relates p to the global context set, *ji* relates it to either the global context set or the context set of an embedded thought or speech eventuality, depending on its eventuality index.

As suggested in Section 5.2, I will treat *oo* as a Junction head (den Dikken 2006) that takes two sets and returns their union (von Stechow 1991).

$$(19) \quad \llbracket P_{stt} oo Q_{stt} \rrbracket = \llbracket P \rrbracket \cup \llbracket Q \rrbracket$$

Unlike earlier implementations of Hamblin alternative semantics that treat lexical items as denoting (often singleton) sets of their traditional denotations (Hamblin 1976) or employ a two-tier system (Beck 2006), in my proposal, expressions have their traditional denotations, and *ji* is responsible for 'lifting' a proposition to a singleton set containing it.

⁵See also Portner & Rubinstein 2012, Silk 2018 for proposals to treat a doxastic modal base on par with a discourse context of a speech event.

7.1 Embedded questions

In an embedded AltQ *ji p oo ji q* (14), the post-supposition of *ji* is satisfied because, with the embedded question being $\{p, q\}$, neither p nor q is entailed by the context set associated with the asking event (20).

$$(20) \quad \begin{aligned} & \llbracket [_{VP} \text{ask}_e C_{+Q} \text{ji}_e p \text{oo} \text{ji}_e q] \rrbracket^{e_0, g} \\ & = \lambda w. \text{Ask}(g(e))(w)(\{p, q\}) \quad \text{Defined only if } cs(g(e)) \not\subseteq p, q \\ & \text{where } cs(g(e)) \text{ is the context set associated with an event of asking.} \end{aligned}$$

I assume that there is a covert interrogative complementizer C_{+Q} (21) in the complement clause. Even though it is semantically vacuous, its requirement for an argument of type $\langle st, t \rangle$ explains the obligatoriness of *ji* in embedded questions.

$$(21) \quad \llbracket C_{+Q} \rrbracket = \lambda P_{stt}. P$$

When a string-identical disjunctive *ji*-construction receives a PolQ interpretation (16, 17), I assume that there is a covert existential operator (22a) (Kratzer & Shimoyama 2002:7(i)) that flattens a set of propositions into a singleton set containing a disjunction of its members.

$$(22) \quad \begin{aligned} \text{a. } & \llbracket \exists \rrbracket^{e_0, g} = \lambda Q_{stt}. \{ \lambda w. \exists \phi \in Q: \phi(w)=1 \} \\ \text{b. } & \llbracket [_{VP} \text{ask}_e C_{+Q} \exists \text{ji}_e p \text{oo} \text{ji}_e q] \rrbracket^{e_0, g} \\ & = \lambda w. \text{Ask}(g(e))(w)(\{ \lambda w'. \exists \phi \in \{p, q\}: \phi(w')=1 \}) \quad \text{Defined only if } cs(g(e)) \not\subseteq p, q \\ & \text{where } cs(g(e)) \text{ is the context set associated with an event of asking.} \end{aligned}$$

Again, the post-supposition of *ji* is satisfied in (22b) because, with the embedded question being $\{p \vee q\}$, neither p nor q is entailed by the context set of asking.

7.2 Conditional antecedents

In an indicative conditional antecedent (2, 13), *ji* is indexed with the matrix speech event e_0 , and consequently, the post-supposition of *ji* constrains the status of the preadjacent proposition in the global context set. (23) shows a schematic denotation of a conditional antecedent with disjunction (13).

$$(23) \quad \llbracket \text{ji}_{e_0} p \text{oo} \text{ji}_{e_0} q \rrbracket^{e_0, g} = \{p, q\} \quad \text{Defined only if } cs(e_0) \not\subseteq p, q$$

For concreteness, I assume that a (covert) modal takes the conditional antecedent as an argument. Setting aside the ordering source, in (24a), the modal takes the modal base f , the consequent ϕ , and the antecedent p , and returns a conditional proposition following Kratzer's (1986) restrictor analysis of conditionals.

$$(24) \quad \begin{aligned} \text{a. } & \llbracket \text{MOD} \rrbracket^{e_0, g} = \lambda f_{sst}. \lambda \phi. \lambda p. \lambda w. \forall w' \in (f(w) \cap p): \phi(w')=1 \\ \text{b. } & \llbracket \text{MOD } f_{sst} \phi \rrbracket^{e_0, g} = \lambda p. \lambda w. \forall w' \in (f(w) \cap p): \phi(w')=1 \end{aligned}$$

Given the denotations in (23) and (24b), there is a type mismatch: the modal expects the antecedent to denote a proposition, while the antecedent is a set of propositions. Here, I

propose a compositional rule (Modified Point-wise Function Application; (25)) that builds on Pointwise Function Application.⁶⁷

(25) Modified Pointwise Function Application

If α is a branching node with daughters β and γ , and $\llbracket \beta \rrbracket^g \in D_{\langle \sigma \tau \rangle}$ and $\llbracket \gamma \rrbracket^g \subseteq D_\sigma$,
then $\llbracket \alpha \rrbracket^g = \{f(x) \in D_\tau : f = \llbracket \beta \rrbracket^g \ \& \ x \in \llbracket \gamma \rrbracket^g\}$.

Composing (23) and (24b) by Modified PFA results in a set of propositions ‘if p then ϕ ’ and ‘if q then ϕ ’ (26).

$$(26) \quad \llbracket (24b) \rrbracket^{e_0, g} (\llbracket (23) \rrbracket^{e_0, g}) \quad (\text{via Modified PFA (25)})$$

$$= \{\lambda w. \forall w' \in (f(w) \cap p): \phi(w')=1, \lambda w. \forall w' \in (f(w) \cap q): \phi(w')=1\}$$

Defined only if $cs(e_0) \not\subseteq p, q$

Then, following Rawlins 2008a,b, 2013, I assume that the need to assert the sentence⁸ triggers an insertion of a covert universal operator (27a). The resulting denotation is a conjunction of two conditional propositions, ‘if p then ϕ , and if q then ϕ ’ where it is required that p and q are not entailed by the global context set.

$$(27) \quad \begin{aligned} &\text{a. } \llbracket \forall \rrbracket^{e_0, g} = \lambda Q_{stt}. \lambda w. \forall p \in Q: p(w)=1 \quad (\text{adapted from Kratzer \& Shimoyama 2002:6}) \\ &\text{b. } \llbracket \forall \text{ MOD } f_{sst} \phi [ji_{e_0} p \text{ oo } ji_{e_0} q] \rrbracket^{e_0, g} \\ &\quad = \lambda w''. \forall r [r \in \{\lambda w. \forall w' \in (f(w) \cap p): \phi(w')=1, \lambda w. \forall w' \in (f(w) \cap q): \phi(w')=1\} \rightarrow \\ &\quad \quad r(w'')=1] \\ &\quad = \lambda w. \forall w' \in (f(w) \cap p): \phi(w')=1 \wedge \forall w' \in (f(w) \cap q): \phi(w')=1 \\ &\quad \text{Defined only if } cs(e_0) \not\subseteq p, q \end{aligned}$$

Lastly, I should note that *ji* also appears in counterfactual conditionals (28). In such cases, since it is common ground that the prejacent p of *ji* is false in the global discourse context, *ji* will need to be indexed with an expanded modal base that includes both p- and $\neg$ p- worlds.

(i) Pointwise Functional Application

If α is a branching node with daughters β and γ , and $\llbracket \beta \rrbracket^{w, g} \subseteq D_{\langle \sigma \tau \rangle}$ and $\llbracket \gamma \rrbracket^{w, g} \subseteq D_\sigma$, then $\llbracket \alpha \rrbracket^{w, g} = \{f(x) \in D_\tau : f \in \llbracket \beta \rrbracket^{w, g} \ \& \ x \in \llbracket \gamma \rrbracket^{w, g}\}$. (Shimoyama 2006:153(f.n.20); see also Kratzer & Shimoyama 2002, Rooth 1985.)

⁷The same effect can be achieved with a type shifter (i) suggested in Dawson 2020 for downward-entailing operators, including conditionals. However, below, Modified PFA will be used in non-downward-entailing contexts as well.

(i) Type shifter for downward-entailing operators:

$\lambda f_{\langle \alpha, \beta \rangle}. \lambda A_{\{\alpha\}}. \forall a \in A[f(a)]$, where $A_{\{\alpha\}}$ is a set of elements of type α (Dawson 2020:136(95))

⁸This is implemented with an assertion operator which requires its sister to denote a singleton set.

(i) Assertion operator A

$\llbracket [A] \alpha \rrbracket = \llbracket \alpha \rrbracket$ defined only if $|\llbracket \alpha \rrbracket| = 1$ (adapted from Rawlins 2013:129(51))

- (28) Context: John is angry because Mary ate a slice of cake he left in the fridge. Mary says, “Come on! Don’t be so mad at me...”
 [Ji hli nee=dii=n gup-t] ii dim=t gup=hl ligi=t naa
 Ji hli NEG=FOC=1SG.I eat-3.II CCNJ PROSP=3.I eat=CN DWID=PN who
 ‘If I hadn’t eaten it, someone else would have eaten it.’ (VG)

7.3 Declarative complements

While anti-rogative predicates require a proposition as an argument, I argue that declarative complements allow *ji* because its post-supposition can constrain the status of the prejacent in the local context set. The analysis in Section 7.1-7.2 showed two indexing possibilities for *ji*: it can be indexed with the matrix subject’s speech/thought eventuality or the speaker’s utterance of the entire sentence. I will argue that the two indexing possibilities lead to inferences of uncertainty and falsity, respectively.

7.3.1 Uncertainty

When *ji* is indexed with the eventuality variable on *ha’niigoot* ‘think,’ the post-supposition of *ha’niigoot ji p* is that *p* is not entailed by the attitude holder’s doxastic state. The type mismatch between a *ji*-clause and an anti-rogative predicate is resolved by the existential operator proposed above (22a), and the need to assert the sentence triggers an insertion of a universal operator (27a) at the last step.

- (29) $\llbracket [\text{VP } ha'niigoot_e \exists ji_e p] \rrbracket^{e_0, g} = \{\lambda w. Ha'niigoot(g(e))(w)(p)\}$ (by Modified PFA)
 Defined only if $cs(g(e)) \not\subseteq p$

Readers may suspect that if the predicate *ha’niigoot* had a universal force, as suggested by its commonly used gloss ‘think,’ that would contradict the post-supposition of *ji*. I assume that *ha’niigoots* is semantically weaker than universal, akin to ‘consider it possible’/‘entertain,’ and it is strengthened to a universal reading if that would not cause contradiction. Empirically, analogous behaviours are seen in variable force modals (Bochnak 2015, Rullmann, Matthewson & Davis 2008),⁹ including in Gitksan (Matthewson 2013, Peterson 2010).

There is in fact some evidence that *ha’niigoots* has a weaker-than-universal force, which comes from an observation that a conjunction of ‘*ha’niigoots (ji) p* and ‘*ha’niigoots (ji) ¬p*’ can be true of a single attitude holder when they do not know whether *p* (30).¹⁰

⁹See also Deal 2011 for an existential model without a universal counterpart.

¹⁰Interestingly, while VG judges both occurrences of *ji* in (30) to be optional, HH judges the second occurrence to be obligatory. This suggests that the post-supposition of *ji* may also be presupposed. The first conjunct (‘Stacy entertains that Fluffy is a dog.’) contextually entails the post-supposition of the second *ji*, which is that the proposition ‘Fluffy is not a dog’ is not entailed by Stacy’s doxastic state. That would explain HH’s requirement for the second *ji* as a Maximize Presupposition effect.

- (30) Context: Stacy will be pet-sitting Fluffy. She thinks Fluffy might be a dog, so she buys some bones. She also thinks Fluffy might be a cat, so she buys some cat food.¹¹
 Ha'niigoot-t [(ji) us[-t]=s Fluffy] ii hox=dii ha'niigoot-t [(ji) nee=dii
 think-3.II ji dog[-3.II]=PN Fluffy CCNJ again=FOC think-3.II ji NEG=FOC
 us[-t]=s Fluffy
 dog[-3.II]=PN Fluffy
 Lit: 'She thinks that (ji) Fluffy is a dog, and she also thinks that (ji) Fluffy is not a
 dog.'
 (VG; Aonuki to appear:4(15))

7.3.2 Falsity

While indexing *ji* with the eventuality variable of the matrix predicate captured the uncertainty inference, indexing it with the utterance event for the entire sentence (31) gives rise to the inference that the content of belief is false.

- (31) $\llbracket [\text{VP } ha'niigoot_e \exists ji_{e_0} p] \rrbracket^{e_0, g} = \{\lambda w. Ha'niigoot(g(e))(w)(p)\}$
 Defined only if $cs(e_0) \not\subseteq p$

In the examples of *ji* with a falsity inference provided in Section 4 (7, 8), the global context $cs(e_0)$ in fact entails $\neg p$. In the report of a third-person's present attitude in (7), the interlocutors know that $\neg p$. In the report of the speaker's past attitude in (8), Lisa's presence in the context provides direct evidence that the prejacent 'Lisa left' is false. The post-supposition of *ji* guards against revising the global context with the belief content, and I argue that this is the source of the falsity inference,¹² following Glass's (2023) analysis of a belief verb *yǐwéi* in Mandarin.

The proposed analysis is consistent with a broader literature on the contribution of an attitude report to the global context. While an assertion that *x* thinks *p* does not immediately add *p* to the common ground of the discourse, it has been observed that such an utterance 'proffers' *p* (e.g., Simons 2007, Urmson 1952). The post-supposition of *ji* blocks this proffering effect.

8 Conclusion

This paper provided novel data on the interaction between disjunction and a morpheme *ji* in Gitksan, which has previously been observed in embedded polar questions, conditional antecedents, and some declarative complements involving uncertain or false attitudes (Aonuki to appear, Brown 2025, Gogag, Hill & Sennott in prep, Hunt 1993, Matthewson 2026, Rigsby 1986). I argued that the data from disjunction provides further motivation for unifying the semantic contribution of *ji* in all of the above-mentioned environments, and proposed that *ji* forms a singleton set containing its propositional argument *p* and constrains the status of *p* in the context set of a speech or thought eventuality it is indexed with. I demonstrated

¹¹Context from TFS Working Group 2012.

¹²The analysis predicts that *ji p* should also be compatible with a context in which the speaker (and not the attitude holder) is uncertain about the truth of *p*.

that the two indexing possibilities motivated in the analyses of *ji* in embedded questions and conditional antecedents respectively give rise to uncertainty and falsity inferences of *ji* in declarative complements. To the extent that a unified analysis is plausible, *ji* provides empirical evidence for a shared meaning component between questions, conditionals, uncertainty, and falsity. The proposed analysis presents a novel analytical possibility for the cross-linguistically observed affinity between conditional antecedents and embedded polar questions (Bhatt & Pancheva 2006, Starr 2014) as well as occurrences of rogativity-related morphemes in non-interrogative environments with uncertainty inferences (Erlewine 2025, Goodhue & Shimoyama 2022).

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