

# Basic pieces, complex meanings: Building attitudes in Navajo and beyond

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Polysemy and coercion of clause-embedding predicates  
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## 1 Introduction

“Languages agree on communicative goals, but disagree on grammatical means” (Bittner 2014) (Sapir 1949, Benthem 1991, von Stechow & Mathewson 2008, ...).

### One lens through which to map disagreement:

- What does the lexicon encode in the entries of individual morphemes?
- What information must be filled in by context?
- Do multiple morphemes work in concert to determine a meaning?

### Previous case study: Crosslinguistic expression of possibility and probability

- What parts of meaning is specified in modals’ lexical entries? By context?
  - Kratzer 1981, Rullmann et al. 2008, *among others*
- What parts of meaning come from interaction with tense, aspect, mood, or adverbial modifiers?
  - Condoravdi 2002; Hacquard 2006; Anand & Brasoveanu 2010; Matthewson 2010; Huitink 2012; Giannakidou & Mari 2016; *among others*.

### Attitude reports and clause-embedding verbs

- Expression of **belief** and **desire** — and distinguishing between them — seem like plausible universal communicative goals.
- Perhaps BELIEF and DESIRE should even be considered semantic primitives (Goddard & Wierzbicka 2002)?

Where do we find crosslinguistic disagreement in attitude reports?

- Languages differ in the size and contents of their attitude verb inventories.
- Languages differ in the diversity seen in their complementation strategies.

### Today’s talk:

- Explore Navajo attitude reports of belief and desire with the verb (*nízin*), where shape of the complement clause correlates with attitude expressed.
- Argue against a polysemy account where *nízin* encodes either belief or desire (either due to lexical ambiguity or contextual influence). Instead:
  - Verb *nízin* denotes situations of general mental attitude.
  - Attitude constrained by embedded (modal) material which also occurs — with related meaning — in main clauses.
- Consider precedent for analysis of *nízin*-sentences and their position in the typological and theoretical landscape.
  - *Nízin* compared to attitude verbs with a ‘parenthetical’ function (Urmson 1952, Hooper 1975, Rooryck 2001, Simons 2007, Lewis 2013).
  - *Nízin*-sentences as a **limiting case** within the landscape predicted by Kratzer’s (2006,2013) and Moulton’s (2009) analysis of English and German attitude reports and verbs of saying in terms of lighter verbs and embedded functional structure.
- Navajo expresses two very familiar attitudes (belief, desire) via a (heretofore) unfamiliar strategy: light verb + heavy complements.

### Acknowledgments:

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## 2 The apparent polysemy of *nízin*

Navajo has a number of specialized clause-embedding verbs, including:

- (1) a. Jáan [’ashkii léecháá’í yiyiiltsán]-ígíí bíl bééhózin.  
John boy dog 3O.3S.see.PERF-COMP 3O.3S.know.IMPF  
‘John knows that the boy saw the dog.’ (Schauber 1979: 17)<sup>1</sup>
- b. Mary [Bíl dibé yiyiisxín]-ígíí yoodlá.  
Mary Bill sheep 3O.3S.kill.PERF-COMP 3O.3S.believe.IMPF  
‘Mary believes that Bill killed the sheep.’ (Schauber 1979: 26)
- c. Kii [naakaii tl’óol yizhbizh]-ígíí yiyíinii’.  
Kii Mexican rope 3O.3S.braid.PERF-COMP 3O.3S.hear.PERF  
‘Kii heard that the Mexican braided the rope.’ (Schauber 1979: 31)
- d. [Mary Bíl yich’i’ yálti’]-go baa ’ákonisin.  
Mary Bill 3O.to 3S.talk.IMPERF-COMP 3O.about 1S.aware.IMPF  
‘I am aware that Mary is talking to Bill.’ (Schauber 1979: 231)
- e. [Mary kinlánígóo] na’asbáa]-go Bíl  
Mary Flagstaff.to 3S.drive.back.PERF-COMP Bill  
bíł yá’át’éeéh.  
3O.3S.happy.IMPF  
‘Bill is happy that Mary drove to Flagstaff.’ (Schauber 1979: 231)
- f. [Shiljí’ ’altso dínóonéel]-go ’ádzaa.  
1poss.horses all 3S.die.FUT-COMP 3O.1S.imagine.PERF  
‘I imagined that all my livestock would die.’ (Schauber 1979: 241)

**However**, sentences translated into English with *think*, *want*, and *wish* all contain (what appears to be) the same verb, *nízin* (first person: *nisin*). Translations correlate with morphology in the complement.

- (2) a. Mary [nahałtin] nízin.  
Mary 3S.rain.IMPF 3S.ATT.IMPF  
‘Mary **thinks** it is raining.’ (Verb in non-future form)

- b. [Nahodooltííł sha’shin] nisin.  
ArealS.rain.FUT probably 1S.ATT.IMPF  
‘I **think** it will probably rain.’ (Particle *sha’shin*)
- c. Alice [nisneez laanaa] nízin.  
Alice 1S.tall.IMPF wishful 3S.ATT.IMPF  
‘Alice **wishes** she (I) were tall.’ (Particle *laanaa*)

Sentences with *nízin* that contain future-marked verbs in the complement (and no particles) can be translated with either *think* or *want*:

- (3) Alice [nahodooltííł] nízin.  
Alice 3S.rain.FUT 3S.ATT.IMPF  
(i) ‘Alice **thinks** it will rain.’ (ii) ‘Alice **wants** it to rain.’  
(Future-marked verb, no particle)

Sentences like (3) are truly ambiguous.

- Conjunction of (3) with its negation is noncontradictory (4).
- Order of *think* vs. *want* in translation depends on context.

- (4) a. *Context*: Alice looks outside and sees dark clouds gathering. It is monsoon time, too, so it has been frequently raining in the afternoon. Alice thinks it will rain. However, Alice must drive to Flagstaff today and she hates driving in rain, so she doesn’t want it to rain.
- b. [Alice [nahodooltííł] nízin] ’ákonidi [[doo nahodooltííł da] nízin].  
Alice 3S.rain.FUT 3S.ATT but NEG 3S.rain.FUT NEG 3S.ATT  
‘Alice thinks it will rain but wants for it not to rain.’
- c. *Other consultant who didn’t hear context in (4-a)*:  
‘I thought you said ‘she wants it to rain, but she doesn’t think it will.’”

<sup>1</sup>Abbreviations in glosses: ATT: ‘attitude verb’; IMPF: imperfective aspect; FUT: future tense/prospective aspect; OPT: optative; PERF: perfective aspect; PAST: past particle; COMP: complementizer; 1poss: 1st person possessive pronoun; 2S: 2nd person subject; 3O: 3rd person object.

### Hypotheses to be considered:

- 1: Attitude determined by *nízin*, which is lexically ambiguous.
  - Separate entries for *nízin*, e.g. *think-nízin* and *want-nízin*.
- 2: Attitude determined by *nízin*, which is underspecified.
  - Context fills in which attitude is expressed, similar to English *must/might*.
- 3: Attitude not determined by *nízin*, but by material in embedded clause.
  - *Nízin* expresses meaning to both beliefs and desires.

### 3 Against the polysemy of *nízin*

I will first argue against the first two hypotheses above, expanded as follows:

1: Multiple lexical entries for *nízin*, minimally one that expresses belief and one that expresses desire.

- Embedded clause shape could still affect the interpretation of the *nízin*-sentence as a whole (if minimal number of *nízin*'s posited) or be selected (if maximal number of *nízin*'s posited).

(5) a.  $\llbracket \text{'think'-}n\acute{i}z\acute{i}n \rrbracket = \lambda p_{st} \lambda x_e \lambda w \forall w' \in \{w\}: w' \text{ is consistent with } x\text{'s beliefs in } w\} : p(w')$

b.  $\llbracket \text{'want'-}n\acute{i}z\acute{i}n \rrbracket = \lambda p_{st} \lambda x_e \lambda w \forall w' \in \{w\}: w' \text{ is consistent with } x\text{'s desires in } w\} : p(w')$

2: Single lexical entry for *nízin* which is underspecified for, e.g., modal quantificational domain (if attitude verbs are modeled in terms of possible worlds).

- Under this account, *nízin* would be similar to entries for English *must/might* where contextual parameters determine the modal base (Kratzer 1981, 1991).

(6)  $\llbracket n\acute{i}z\acute{i}n \rrbracket^c = \lambda p_{st} . \lambda x . \lambda w . \forall w' : w' \in \cap ACC^{c,x}(w) . p(w')$

However, **neither hypothesis will suffice.**

### The improbability of verbal homophony in Navajo:

The account in (5) is particularly improbable given Navajo's lack of verbal homophony, both in general and (in particular) across different aspectual forms.

- A full survey of the comprehensive Young and Morgan (1980, 1987) dictionaries returns only four pairs of verbs like those below, which are homophonous in a single aspectual form. In other aspectual forms, homophony disappears.

Table 1: *Homophony between two verbs in perfective aspectual form only:*

Imperfective aspect	Perfective aspect
<i>háníshááh</i> 'I am going after it'	<i>haséyá</i> 'I went after it'
<i>haashááh</i> 'I am climbing up'	<i>haséyá</i> 'I climbed up'

(entries from Young and Morgan 1980)

We would have to say that homophony persists for *nízin* (uniquely and exceptionally) across all aspects:

Table 2: *Imperfective aspect (excerpt):*

Person	Verb	Translations
1S	<i>nisin</i>	'I think, want, wish, hope'
2S	<i>nínizin</i>	'you think, want, wish, hope'
3S	<i>nízin</i>	'he/she thinks, wants, wishes, hopes'
1pl	<i>niidzin</i>	'we think, want, wish, hope'

Table 3: *Perfective aspect (excerpt):*

Person	Verb	Translations
1S	<i>niizíí'</i>	'I thought, wanted, wished, hoped'
2S	<i>nínizíí'</i>	'you thought, wanted, wished, hoped'
3S	<i>niizíí'</i>	'he/she thought, wanted, wished, hoped'
1pl	<i>niidzíí'</i>	'we thought, wanted, wished, hoped'

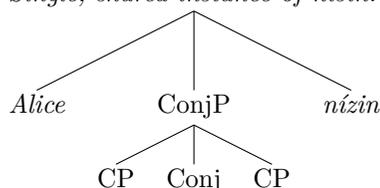
## The challenge of conjoined clauses under single *nízin*

Data like (7) are problematic for both (5) and (6), where two clauses are **conjoined and embedded** beneath a single overt instance of *nízin*.

- First embedded clause describes situation that Alice **believes** to be true.
  - Second embedded clause describes situation that Alice **wants** to be true.
- (7) a. *Context:* Alice thinks Bill moved to Flagstaff. She wants to go visit him some time, but she does not have any definite plans to do so and knows it is very likely it will not happen.
- b. Alice [Bill Kinlánígóó 'íiná] 'ákondi [bich'į deesháál]  
 Alice Bill Flagstaff.to 3S.move.PERF but.even.so 3O.to 1S.go.FUT  
*nízin*.  
 3S.ATT.IMPF  
 'Alice thinks Bill moved, but even so she wants to go see him.'

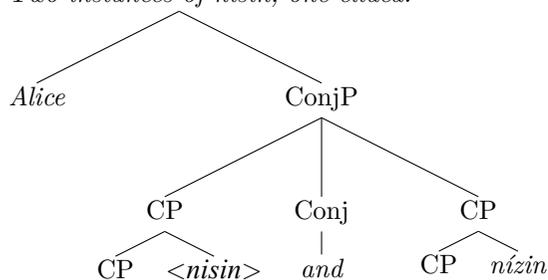
The challenge posed by (7) persists regardless of the syntax for (7): single *nízin* (8) or ellipsis of second *nízin* (9).

- (8) *Single, shared instance of *nízin*:*



In the single-*nízin* tree in (8), the entry of *nízin* would resolve to express either belief or desire. The interpretation attested for (7-b) should not be possible.

- (9) *Two instances of *nízin*, one elided:*



Ellipsis of one instance of *nízin* as in (9) is predicted to fail given semantic identity conditions frequently linked to ellipsis (Keenan 1971, Sag and Hankamer 1984, Dalrymple et al. 1991, Fiengo and May 1994, *among others*).

- After ellipsis of one modal in English (assuming underlying structure like (9)), only one modal interpretation is available:
- (10) Mary may be at the park now and go to the fair tomorrow.
- a. *Priority (rule-oriented) interpretation:* Given the rules, Mary is allowed to be at the park right now, and she is allowed to go to the fair tomorrow.
  - b. *Epistemic interpretation:* Given my evidence, Mary might be at the park now and she might go to the fair tomorrow.
  - c. *#Mixed interpretation:* It is possible that Mary is at the park now, and she is allowed to go to the fair tomorrow.

**Section conclusion:** One **constant** entry for *nízin* is needed, while still allowing for attested range of interpretations of *nízin*-sentences.

## 4 Against the vagueness of belief and desire

If we posit a single entry for *nízin*, we must be sure to avoid the conclusion that Navajo speakers do not distinguish between attitudes of belief and desire.

- That is, sentences like (11) would be **vague** (e.g. expressing some general 'feeling' towards the proposition *that Obama will win*).
- (11) Kii [Obama hodínóohnéél] *nízin*.  
 Kii Obama 3S.win.FUT 3S.ATT.IMPF  
 (i) 'Kii thinks Obama will win.' (ii) 'Kii wants Obama to win.'

Two types of evidence point away from a vague account.

**First:** Recall that conjunctions of the following form are not contradictory.

- If the two *nízin*-sentences expressed the same (vague) meaning, the lack of contradiction is mysterious.
- (12) [Alice [nahodoołtįįł] *nízin*] 'ákondi [[doo nahodoołtįįł da]  
 Alice ArealS.rain.FUT 3S.ATT but NEG ArealS.rain.FUT NEG  
*nízin*].  
 3S.ATT.IMPF  
 'Alice thinks it will rain but wants for it not to rain.'  
 'Alice wants it to rain, but thinks it will not rain.'

**Second:** It is not possible for two subjects to share a single *nízin* if each has a different attitude towards the embedded proposition.

- (13) a. *Context:* It is 2012 before the presidential election. Given the evidence he’s seen, Ron thinks that Obama will win. However, Ron doesn’t want Obama to win. Ron’s friend Kii really wants Obama to win, but he firmly believes that Obama will not win.
- b. #Ron dóó Kii [Obama hodínóolnéé] nízin.  
 Ron and Kii Obama 3S.win.FUT 3S.ATT.IMPF  
*(Intended:* ‘Ron and Kii have some feeling about Obama winning’)  
*Comment:* “They want for him to win. One doesn’t think and the other one want. I don’t think you can have ‘think’ and ‘want’ in the same sentence. One’s going to win out over the other.”

**Section conclusion:** One entry for *nízin*, but distinguish belief and desire.

## 5 Lighter *nízin*, heavier complements

### 5.1 The meaning of *nízin*

**Proposal:** *Nízin* ‘hosts’ the individual and temporal perspective used to evaluate the embedded clause. *Nízin* denotes a set of **mental attitude situations** experienced by the **attitude holder** (subject of *nízin* (Kratzer 2006, 2013)).

- §6.4 gives denotation for *nízin* modeled on entries for attitude verbs in Kratzer (2006, 2013) and Moulton (2009).

**Question:** If *nízin* does not determine the attitude expressed, what does?

**Answer:** Material (overt or covert) within the embedded clause.

- All clauses embeddable by *nízin* have **main clause counterparts** with **related meanings**.

### 5.2 Sentences with particles

The most obvious semantic and structural parallels hold between main clauses and *nízin*-sentences that contain particles *laanaa* (14) or *sha’shin* (15).

- (14) a. Nahaltin laanaa.  
 ArealS.rain.IMPF wishful  
 ‘I wish it were raining.’ (Speaker’s desire)
- b. Kii [nahaltin laanaa] nízin.  
 Kii ArealS.rain.IMPF wishful 3S.ATT.IMPF  
 ‘Kii wishes it were raining.’ (Subject’s desire)
- (15) a. Nahaltin sha’shin.  
 ArealS.rain.IMPF probably  
 ‘It’s probably raining,’ ‘It must be raining.’  
 (Epistemic likelihood given speaker’s beliefs)
- b. Kii [nahaltin sha’shin] nízin.  
 Kii ArealS.rain.IMPF probably 3S.ATT.IMPF  
 ‘Kii thinks it is probably raining,’ ‘Kii thinks it must be raining.’  
 (Epistemic likelihood given subject’s beliefs)

When *nízin* is **absent** as in the (a)-sentences above, the desires or epistemic possibilities expressed are those of the **speaker** at **utterance time**.

- This is the case even in contexts that strongly favor an individual (16) or temporal (17) perspective other than that of the speaker.

- (16) a. *Context:* I don’t want it to be raining, but Kii does (he is a farmer and his crops are going dry). We are discussing what Kii wants to be going on. Kii wants the temperature to cool, he wants the wind to quiet, and:
- b. #Nahodootjil laanaa.  
 ArealS.rain.FUT wishful  
*(Intended:* ‘Kii wishes it would rain.’)  
*Can only mean:* ‘I wish it would rain.’
- c. Kii [nahaltin laanaa] nízin.  
 Kii ArealS.rain.IMPF wishful 3S.ATT.IMPF  
 ‘Kii wishes it were raining.’

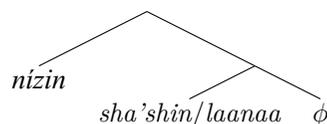
- (17) a. *Context:* It is Thursday. On Monday, I wanted it to rain next Saturday. Now, however, I have plans to go hiking next Saturday and no longer want it to rain. I am telling you how I used to feel:
- b. #Nahodoołtjįł laanaa.  
ArealS.rain.FUT wishful  
(*Intended:* ‘I wished that it would rain.’)  
*Can only mean:* ‘I wish that it would rain.’
- c. [Nahodoołtjįł laanaa] niizjį.  
ArealS.rain.FUT wishful 1S.ATT.PERF  
‘I wished that it would rain.’

By contrast, the *nizin*-sentences in (16-c) and (17-c) can only express desires of the **subject** at the time when the subject had this thought, not desires of some other salient person or at some other time.

**Proposal for particles:** *Sha’shin* and *laanaa* are modal quantifiers that are evaluated relative to the mental attitude situation introduced by *nizin*.

- When embedded, the subject of *nizin* (the mental attitude holder) will provide the perspective relative to which *sha’shin* and *laanaa* are evaluated.
- §6.4 gives denotations for *laanaa* and *sha’shin* modeled on Kratzer (2006, 2013) and Moulton (2009).

- (18) a. *Skeleton of nizin-sentence:*



- b. *Skeleton of main clause:*



**Precedent for attitude verbs as perspective setters for modals:**

- Speas (2004), Stephenson (2007), and Hacquard (2010) discuss sentences like (19), where the perspective for the embedded modal seems to obligatorily be the subject of the attitude verb.

- (19) a. John might<sub>speaker</sub> be home.  
b. Mary thought that John might<sub>Mary</sub> be home.

### 5.3 Sentences without particles

Main clauses and *nizin*-sentences that contain **non-future-marked verbs** unambiguously express assertions (20-a) and beliefs (20-b).

- (20) a. Mary hooghandi sidá.  
Mary home.LOC 3S.sit.IMPF  
‘Mary is at home.’
- b. Kii [Mary hooghandi sidá] nizin.  
Kii Mary home.LOC 3S.sit.IMPF 3S.ATT.IMPF  
‘Kii thinks Mary is at home.’

Main clauses and *nizin*-sentences with **future-marked verbs** are ambiguous between assertions or priorities/obligations (21-a) and beliefs or desires (21-b).

- (21) a. ‘Atiin t’áá yá’adát’ééhígíí ’ádadoolníł.  
road 3plS.good 3plS.be.FUT  
(i) ‘There will be new roads.’ (ii) ‘There ought to be new roads.’
- b. Alice [’atiin t’áá yá’adát’ééhígíí ’ádadoolníł] nizin.  
Alice road 3plS.good 3plS.be.FUT 3S.ATT.IMPF  
(i) ‘Alice thinks there will be new roads.’  
(ii) ‘Alice wants there to be new roads.’

Recall that the ambiguity of *nizin*-sentences like (21-b) was motivated by the noncontradiction of e.g. Alice [ $\phi$ ] *nizin*, but Alice [ $\neg\phi$ ] *nizin* (4).

- We can reproduce this for main clauses like (21-a) as in (22).

- (22) a. *Context:* You and I are town inspectors. We visit towns and tell them what they should fix per safety standards, and what will be possible given their budgets. You say the roads in this town need to be fixed in order to meet safety standards, but you have seen that the town is very low on money and will not be able to afford it. You’re telling me about the situation.
- b. [’Atiin t’áá yá’adát’ééhígíí ’ádadoolníł] ’ákondi [doo ’ádadoolníł road 3plS.good 3S.be.FUT but NEG 3S.be.FUT da].  
NEG  
‘There need to/should be new roads, but it’s not going to happen.’  
*Lit.* #‘There will be new roads, but there won’t be.’

### 5.3.1 Priorities and desires

I propose that the desire and priority interpretations of sentences like (21) have the same source: both contain the same modal operator.

There is precedent for relating desires and more general priority modality:

- Portner (2009): Priority modals are modal expressions that are goal-, rule-, and/or desire-oriented (teleological, deontic, bouletic).
- Rubinstein (2012): Deeper semantic similarities between English *want* and *need/should/ought*.

Intuition: General priorities are restricted to desires in the presence of *nízin*.

- That is, main clauses express a broader notion of priority modality that can include goals that conflict with the desires of the speaker.

In (23), the subject of *nízin* (*nisin*) in the second clause is the speaker. The main clause expresses the speaker's more general obligations whereas the *nízin*-sentence expresses the more restricted set of the speaker's personal desires.

- (23) a. *Context:* Society tells us that one should eat cabbage to be healthy. But you hate cabbage and don't want to eat it. You say:
- b. Ch'il ligaaí deeshííł ndi [doo deeshííł da]  
 cabbage 3O.1S.eat.FUT but NEG 3O.1S.eat.FUT NEG  
 nisin.  
 1S.ATT.IMPF  
 'I should eat cabbage, but I don't want to eat it.'

**Proposal:** Main clauses and *nízin*-sentences can contain a covert PRIORITY modal operator, which quantifies over worlds consistent with priorities held in the situation of evaluation.

- When embedded by *nízin*, the subject of *nízin* (the mental attitude holder) will provide the perspective relative to which PRIORITY is evaluated.

- (24) a. *Skeleton of nízin-sentence:*



- b. *Skeleton of main clause:*



§6.4 defines PRIORITY modeled on Kratzer (2006, 2013) and Moulton (2009).

**Question:** Should priority modality be included in the entry of future marking? Or should PRIORITY select for future-marked verbs?

### 5.3.2 Assertions and beliefs

I likewise propose that the belief and assertion interpretations of sentences like (20) and (21) have the same source: both contain the same modal operator.

There is significant precedent in the semantic and philosophical literature for a link between assertions and attitudes of belief (Kissine 2009, Stalnaker 1978).

- Structurally, both kinds of expressions have been claimed to contain a covert epistemic (belief-oriented) modal (Alonso-Ovalle & Menéndez-Benito 2010; Hacquard 2010; Chierchia 2006; Kratzer & Shimoyama 2002).

– E.g. ASSERT from Alonso-Ovalle & Menéndez-Benito 2010:

$$(25) \quad \llbracket \text{ASSERT} \rrbracket^c = \lambda p. \lambda w. \forall w' \in \text{Epistemic}_{\text{speaker-in-}c}(w). p(w')$$

(Alonso-Ovalle & Menéndez-Benito 2010: (20))

**In fact**, while I have been describing *nízin*-sentences as expressing beliefs, they actually carry rather stronger meanings than what we might allow for English belief reports.

- This strength is consistent with an analysis in which *nízin*-sentences expressing 'beliefs' actually express **assertable content** attributed to the subject of *nízin*.
- Navajo *nízin*-sentences can express propositions for which the subject has direct evidence (i.e. something which the subject could assert) (26-b). By contrast, the English translation of (26-b) is questionable.<sup>2</sup>

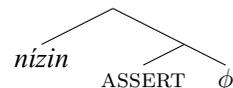
<sup>2</sup>I thank Angelika Kratzer and Barbara Partee for raising this point.

- (26) a. *Context:* We are all talking about where Mary is. I do not know. Kii says he saw Mary at her home just a moment ago. I report Kii's thinking to you, saying:
- b. Kii [Mary hooghandi sidá] nízin.  
 Kii Mary home.LOC 3S.sit.IMPF 3S.ATT.IMPF  
 ? 'Kii thinks Mary is at home.'  
*Comment:* "You're reporting that's what he's thinking, it's okay."

**Proposal:** Main clauses and *nízin*-sentences can contain a covert ASSERT modal operator, which quantifies over worlds consistent with beliefs held in the situation of evaluation.

- When embedded by *nízin*, the subject of *nízin* (the mental attitude holder) will provide the perspective relative to which ASSERT is evaluated.
- §6.4 gives denotation for ASSERT modeled on Kratzer (2006, 2013) and Moulton (2009).

(27) a. *Skeleton of nízin-sentence:*



b. *Skeleton of main clause:*



In contrast with PRIORITY, ASSERT imposes no selectional restrictions on the temporal form of embedded verbs.

- ASSERT can embed clauses containing future- and non-future-marked verbs.

## 6 *Nízin* in the landscape of clause-embedding verbs

### 6.1 Summary of proposal for *nízin*

#### Empirical observations:

- *Nízin* is constant in meaning across attitudes (§3).
- Navajo does not fail to differentiate belief from desire (§4).
- Systematic — still intuitively described — parallels hold between main clauses and clauses embedded by *nízin* (§5).

#### Theoretical claims:

- The function of *nízin* is only to introduce the **individual** and **temporal** perspective according to which embedded material in the complement clause is evaluated.
- When embedded by *nízin*, overt and covert modal operators (ASSERT, PRIORITY, *laanaa*, *sha'shin*) determine the attitude expressed.

#### Claims to be made below:

- Navajo *nízin*-sentences don't lend themselves to views of attitude reports where attitude is determined by the choice of attitude verb.<sup>3</sup>
- Navajo **builds** its attitudes of belief and desire from **more basic pieces**.
- The strategy exhibited by Navajo is one which we find precedent for. The next subsections consider:
  - *Nízin* as compared with with attitude verbs in English with a 'parenthetical' or 'evidential' function
  - *Nízin* as a limiting case within the landscape predicted and formalized by Kratzer (2006, 2013) and Moulton (2009).

### 6.2 Attitude verbs with a 'parenthetical' function

Simons (2007) observes that different utterances of sentences like (28) can differ in their 'main point.'

(28) Henry thinks that Louise was with Bill last night.

**Key for us:** Attitude verb in (28) can be interpreted 'parenthetically,' so the main point is carried by the embedded clause (Urmson 1952, Hooper 1975, Rooryck 2001, Simons 2007, Lewis 2013, Denis 2015).

- (28) is a felicitous answer to questions which concern the content of the embedded clause (29).

<sup>3</sup>Authors who develop, or assume, a verb-driven view of attitude reports include Cresswell and von Stechow (1982), Heim (1992), Moltmann (1997), Schlenker (1999), von Stechow (2002), van Geenhoven and McNally (2005), Hacquard (2006, 2010), Villalta (2008), Condoravdi and Lauer (2010), Stephenson (2010), Rubinstein (2012), Anand and Hacquard (2013), Charlow and Sharvit (2014), Grano (2015), and Pearson (to appear).

- (29) a. A: Who was Louise with last night?  
 b. B: Henry thinks/I think that she was with Bill.  
 (Simons 2007: (2))

Contrast (29) with the use of *think* in a non-parenthetical manner:

- (30) a. A: Why is Henry upset?  
 b. B: Henry thinks that Louise was with Bill last night.  
 (adapt. Simons 2007: (3))

When used parenthetically, attitude verbs function help to identify the “source and reliability of the embedded claim” (Simons 2007: 1034).

- Urmson (1952): The identification of source and reliability is something we associate with evidentials (Rooryck 2001).
- Other verbs that can be used in this way: *hear, say, imagine, regret, discover* (Simons 2007).

In addition to belief-related uses (30), parenthetical *think* also permits desire-like uses (31).<sup>4</sup>

- As in Navajo, the desire-like interpretation hinges on future marking.
- (31) a. A: What will you get from the buffet?  
 b. B: I think that I will get spinach soup.  
 ≈ I am disposed to get (i.e. have a preference for) spinach soup.

### What *nízin* adds to the picture:

- Previous work disagrees whether English lexicon has special light lexical entries for *think* when used parenthetically.
  - Simons (2007) and Lewis (2013) argue that attitude verbs have only one semantic denotation, but come by their parenthetical/evidential-like use due to a process of pragmatic reasoning. (Cf. ambiguity account by Thompson & Mulac (1991)).
- By contrast, *nízin* **only** has a ‘light’ or ‘evidential’ meaning.
- **Crosslinguistic variation?** Some languages (e.g. Navajo) may encode as new lexical items the kinds of meanings said to arise through pragmatics or grammaticalization in other languages.

<sup>4</sup>I thank Peggy Speas and Angelika Kratzer for bringing these examples to my attention.

## 6.3 Lighter attitude verbs (Kratzer, Moulton)

Kratzer (2006, 2013) — and later Moulton (2009) — present an alternative to familiar compositional accounts of attitude reports and communicative attitudes in which the verb alone determines the attitude reported.

- A modal semantics is maintained for attitude reports in their entirety, but modal meaning comes from functional material in the periphery of the embedded clause.
- This proposal is the starting point for the formal investigation of *nízin*.

One of the constructions that Kratzer (2013) considers is noise-making verbs — not taken to be inherently modal expressions — which take on reportative interpretations when they embed clauses.

- (32) a. I { sighed / growled / chirped / squeaked / brayed / barked }.  
 b. I { sighed / growled / chirped / squeaked / brayed / barked } that Orcutt was a traitor.  
 (Kratzer 2013)

Kratzer proposes that all verbs in (32-a) and (32-b) have entries like (33) (no polysemy): *sigh* describes situations of ‘sighing.’

- The subject is added later in the derivation via composition with a head which introduces an external argument (Kratzer 1996).

- (33)  $\llbracket \textit{sigh} \rrbracket = \lambda s. \textit{sighing}(s)$  (Kratzer 2013a: 52)

(33) composes with clause containing functional head *SAY*, a covert modal.

- (34) a. Ralph sighed [ *SAY* [that Orcutt was a spy] <sub>$\phi$</sub>  ].  
 b.  $\llbracket \textit{SAY} \rrbracket = \lambda p. \lambda s. \forall w \in f_{\textit{content}}(s) \rightarrow \exists s' \leq w \ \& \ p(s')$   
 c. [ *SAY* [that Orcutt was a spy] <sub>$\phi$</sub>  ] describes situations that carry the information (content) that Orcutt was a spy.  
 (adapt. Kratzer 2013a)

Kratzer (2006, 2013a) and Moulton (2009) consider similarly ‘light’ entries for many other verbs, including *believe, see, and claim*.

For German, Kratzer proposes that the embedded SAY may be overtly realized as reportative marker *sollen* (35).

- (35) a. Ralph behauptet [Ortcutt soll ein Spion sein].  
 Ralph 3S.claims Orcutt REPORT a spy 3S.be  
 ‘Ralph claims that Orcutt is a spy.’ (Kratzer 2013a: 57)
- b.  $\llbracket \textit{claim} \rrbracket = \lambda s.\textit{claiming}(s)$

### What *nizin* adds to the picture:

Navajo *nizin* is a ‘limiting case’ in the typological picture in which all meaning specific to a particular attitude is located in the embedded clause.

In English and German by contrast, embedding verbs are no longer modal, but they still determine certain aspects of the attitude report.

- *Sollen* has selectional restrictions: cannot be embedded by mental states (Kratzer 2013: 58)
- *Behauptet* and *soll*: “not redundant, but matching” (Kratzer 2013: 56).

## 6.4 Spelling out the system for *nizin*

**Attitude verb:** *Nizin* contributes the part of meaning held in common by beliefs and desires: it denotes ‘mental attitude’ situations.

- In (36), I have added worlds of evaluation back in, whereas they were suppressed in entries above.

(36)  $\llbracket \textit{nizin} \rrbracket = \lambda s.\lambda w.\textit{mental-attitude}(s)(w)$

### Simplified<sup>5</sup> inventory of modal operators:

- (37) a.  $\llbracket \textit{sha'shin} / \textit{ASSERT} \rrbracket = \lambda p.\lambda s.\lambda w.\forall w' : w' \in \text{EPI}(s)(w).\textit{p}(w')$   
 b.  $\llbracket \textit{laanaa} \rrbracket = \lambda p.\lambda s.\lambda w.\forall w' : w' \in \text{DES}(s)(w).\textit{p}(w')$   
 c.  $\llbracket \textit{PRIORITY} \rrbracket = \lambda p.\lambda s.\lambda w.\forall w' : w' \in \text{PRI}(s)(w).\textit{p}(w')$

<sup>5</sup>These entries do not represent differences between *ASSERT* and *sha'shin*; see Bogal-Allbritten (2016, §3.3).

### Illustration of composition of (38):

- Composition follows steps from Kratzer (2006, 2013).

- (38) Alice [nahaltin] *nizin*.  
 Alice ArealS.rain.IMP 3S.ATT.IMPF  
 ‘Alice thinks it is raining.’

- (39) **Step 1:** *ASSERT* and  $\phi$  compose via Function Application:

$$\begin{array}{c} \text{ASSERT} \quad \phi \\ \diagdown \quad \diagup \\ \llbracket \textit{ASSERT} \rrbracket (\llbracket \textit{it is raining} \rrbracket) \\ = [\lambda p.\lambda s.\lambda w.\forall w' : w' \in \text{EPI}(s)(w).\textit{p}(w')] (\llbracket \textit{it is raining} \rrbracket) \\ = \lambda s.\lambda w.\forall w' : w' \in \text{EPI}(s)(w).\textit{it is raining}(w') \end{array}$$

- (40) **Step 2:** *Nizin* and embedded clause compose by Predicate Modification:

$$\begin{array}{c} \textit{nizin} \quad \text{ASSERT} \quad \phi \\ \diagdown \quad \diagup \quad \diagup \\ \llbracket \textit{nizin} \rrbracket \oplus \llbracket \textit{ASSERT it is raining} \rrbracket \\ = \lambda s.\lambda w.\textit{mental-attitude}(s)(w) \\ \quad \& \forall w' : w' \in \text{EPI}(s)(w).\textit{it is raining}(w') \end{array}$$

Following Kratzer (2006, 2013), the subject of *nizin* is introduced via a functional head EXP.

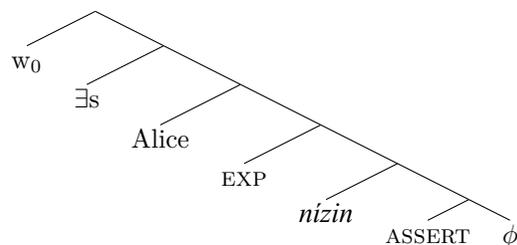
- Composition of EXP via Situation Identification (cf. Kratzer’s (1996) Event Identification).

(41)  $\llbracket \textit{EXP} \rrbracket = \lambda x.\lambda s.\lambda w.\textit{experiencer}(x)(s)(w)$

- (42) **Step 3:** Composition of EXP and (40):

$$\begin{array}{c} \text{EXP} \quad \textit{nizin} \quad \text{ASSERT} \quad \phi \\ \diagdown \quad \diagup \quad \diagup \quad \diagup \\ \llbracket \textit{EXP} \rrbracket \oplus \llbracket \textit{nizin} \textit{ASSERT it is raining} \rrbracket \\ = \lambda x.\lambda s.\lambda w.\textit{mental-attitude}(s)(w) \quad \& \textit{experiencer}(x)(s)(w) \\ \quad \& \forall w' : w' \in \text{EPI}(s)(w).\textit{it is raining}(w') \end{array}$$

(43) **Final Steps:**



*Alice* saturates the experiencer argument *x*. Situation argument *s* is existentially closed. The world of evaluation is filled in ( $w_0$ ).

(44)  $\llbracket (43) \rrbracket = \exists s. \text{mental-attitude}(s)(w_0) \ \& \ \text{experiencer}(\text{Alice})(s)(w_0)$   
 $\ \& \ \forall w' : w' \in \text{EPI}(s)(w_0). \text{it is raining}(w')$

There exists a mental attitude situation *s* in  $w_0$  experienced by *Alice*. In all worlds  $w'$  compatible with the epistemic propositional content in *s* (i.e. *Alice's* beliefs in *s*), it is raining in  $w'$ .

**Beliefs (and desires, not shown) are built.**

As in Kratzer (2006, 2013) and Moulton (2009), the attitude verb and the embedded functional structure are related by the shared situation argument *s*.

- *Nizin* restricts *s* to one of mental attitudes.
- ASSERT restricts *s* to one associated with epistemic propositional content.

## 7 Conclusions and a look ahead

### Typological conclusions:

Navajo has demonstrated how attitudes of belief and desire can be built from a light verb (*nizin*) and embedded modal operators, also attested in main clauses.

- Perhaps meanings like BELIEF and DESIRE are universally expressible as discrete and even primitive meanings (they are certain discrete in Navajo)...
- ...but Navajo shows us that there is no guarantee that these two notions will map onto distinct lexical entries.

### Theoretical conclusions:

*Nizin* fits into a diversifying theoretical picture of attitude verbs:

- Attitude verbs with a ‘parenthetical’ or ‘evidential’ function.
- Attitude verbs from which modality has been removed and assigned to functional structure in the complement.
- The contribution of *nizin* and embedded material can be usefully modeled in the framework of Kratzer (2006, 2013) and Moulton (2009).

### Ongoing and future work:

**Question:** Does a cline exist within the set of Navajo clause-embedding verbs?

- *Nizin*-sentences are a dramatic case of key aspects of meaning being stripped from attitude verbs and reassigned to embedded material.
- Do some clause-embedding verbs cede certain meaning to embedded material but retain more semantic content than *nizin*?

For example, what of the verbs originally seen in (1), repeated in part below?

(45) Kii [naakaii tl'ool yizhbizh]-ígíí yiyíinii'.  
 Kii Mexican rope 3O.3S.braid.PERF-COMP 3O.3S.hear.PERF  
 ‘Kii heard that the Mexican braided the rope.’ (Schauber 1979: 31)

Schauber (1979) shows that verbs like those in (45) can either take *-ígíí* (45) or *-go* as the complementizer. complementizer.

- When the complementizer *-ígíí* is used, the content of the embedded clause is presumed familiar within the context.
  - In terminology from Simons (2007), the embedded clause does not carry the ‘main point’ of the utterance when marked by *-ígíí* (46-b).
- If the complementizer *-go* is instead used, the content of the embedded clause can carry the main point of the utterance (46-c).
- Only complements marked by *-go* are licit where B’s embedded clause answers A’s question:

(46) *Embedded clause answers A's question*

- a. A: Háágóólá Mary 'íyáa-go niniih.  
 where.to.Q Mary 3S.go.PERF-COMP.GO 2S.hear  
 'Where do you hear that Mary went?'
- b. B,v.1: # [Mary Kinlánígóó 'íyáh]-ígíí yishniih.  
 Mary Flagstaff.to 3S.go.PERF-COMP.IGII 1S.hear  
 'I hear that Mary has gone to Flagstaff.'
- c. B,v.2: [Mary Kinlánígóó 'íyáh]-go yishniih.  
 Mary Flagstaff.to 3S.go.PERF-GO 1S.hear  
 'I hear that Mary has gone to Flagstaff.'  
 (Schauber 1979: 252-253)

- Both complementizers are licit where B's main clause answers A's question.

The discourse-familiarity requirements imposed by *-ígíí* recall the familiarity required by so-called English **response stance verbs**, e.g. *agree*, *deny*, and *confirm* (Cattell 1978, Anand and Hacquard 2014).

- Can Navajo verbs become response stance-like due to the influence of *-ígíí*? (Bogal-Allbritten and Moulton to appear, for Korean).
- What meaning is contributed by *yishniih* 'I hear'? By *-ígíí*?

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## A Appendix: *Nízin* is a clause-embedding verb

There is some appeal (if ultimately wrong) to the idea that *nízin* is **not** a true clause-embedding verb.

- Sentences in (1) obligatorily include a complementizer, *-ígíí* (1-a)-(1-c) or *-go* (1-d)-(1-f). Bracketed clauses in (2) and (3) never include *-ígíí* or *-go*.
- In addition, *nízin* sentences exhibit (optional) indexical shift.

- In order to obtain coreference between subjects of *nízin* and embedded verb in (47), embedded verb must be marked for first-person subject (*nisneez*) (Schauber 1979, Speas 2000).

- (47) Alice [nisneez      laanaa] nízin.  
 Alice 1S.tall.IMPF wishful 3S.ATT.IMPF  
 ‘Alice<sub>i</sub> wishes she<sub>i</sub> (I) were tall.’

But Speas (2000) shows that despite appearances, such clauses are embedded and are not, e.g., quotations (direct discourse).

- In fact, Speas considers clauses embedded by verb of speech *ní*, but I have confirmed all of her tests for *nízin* sentences and added data in (49).

The bracketed clause in (48-d) contains deictic term *yiskáago* ‘tomorrow,’ which is evaluated relative to the time of evaluation for *nízin* and not the time of the original utterance event by Kii.

- *Yiskáago* ‘tomorrow’ was not even part of Kii’s original utterance.

- (48)
- Context, part 1:* On Wednesday I talk with Kii about what he wants to do on the upcoming weekend. Kii says:
  - Damóo Kinlánígóó deesháál.  
Sunday Flagstaff.to 1S.go.FUT  
‘I will go to Flagstaff.’
  - Context, part 2:* On Saturday, I am talking to you about Kii. I say:
  - Kii [yiskáago Kinlánígóó deesháál] nízin.  
Kii tomorrow Flagstaff.to 1S.go.FUT 3S.ATT.IMPF  
‘Kii wants to go to Flagstaff tomorrow.’  
*Lit:* Kii *nízin*, I<sub>Kii</sub> will go to Flagstaff tomorrow.  
(adapt. from Speas 2000: (11))

In addition, *nízin* occurs in diferent aspectual forms, including perfective (49) in addition to imperfective (all examples seen so far).

- In (49-b), the future-marked verb in the bracketed clause is necessarily interpreted as future-in-the-past.
- Omission of *nízin* (49-c) only allows a ‘true’ future (relative to speech time) interpretation.

- (49)
- Context:* It is Wednesday. Last Monday, I wanted it to rain over the upcoming weekend. Now, however, I have plans to go hiking on the weekend and no longer want it to rain. I am telling you how I used to feel:
  - [Nahodoołtíít laanaa] niizíí’.  
ArealS.rain.FUT wishful 1S.ATT.PERF  
‘I wished that it would rain.’
  - #Nahodoołtíít laanaa.  
ArealS.rain.FUT wishful  
*Can only mean:* ‘I wish that it would rain.’