The decomposition of belief and desire

SULA 8 May 16, 2014, UBC
Elizabeth Bogal-Allbritten eba@linguist.umass.edu

1 Introduction

• Since Hintikka (1962, 1969), sentences like (1) have received a modal semantics:

(1) a. Alice thinks that it is raining. b. Alice wants it to rain.

• Typical truth conditions for sentences with think and want are as follows:

(2) a. \( \square [\text{Alice thinks that it is raining}] = \forall w' \in \{w': w' \text{ is a world consistent with Alice’s beliefs in } w\} : \text{rain}(w') \) 

Alice thinks it is raining is true just in case in all possible worlds consistent with Alice’s beliefs in the world of evaluation, it is raining in those worlds.

b. \( \square [\text{Alice wants it to rain}] = \forall w' \in \{w': w' \text{ is a world consistent with Alice’s desires in } w\} : \text{rain}(w') \) 

Alice wants it to rain is true just in case in all possible worlds in which Alice’s desires (in the world of evaluation) come true, it is raining in those worlds.

• Many subsequent authors put all the modal meaning in the verbs think and want themselves:

(3) a. \( \llbracket \text{think} \rrbracket = \lambda p. \lambda x. \lambda w. \forall w' \in \{w": w" \text{ is consistent with x’s beliefs in } w\} : p(w') \)

b. \( \llbracket \text{want} \rrbracket = \lambda p. \lambda x. \lambda w. \forall w' \in \{w": w" \text{ is consistent with x’s desires in } w\} : p(w') \)

• Received view: Embedding verb has the modal meaning, the embedded clause only contributes a proposition.

→ Is this picture satisfying for all clause-embedding verbs in English? No.

• Kratzer (2006, 2013) and Moulton (2009) argue that at least for some verbs in English and related languages, the above picture should be reversed:

• Decompositional analysis: The embedding verb has a light meaning and modality is contributed by material (covert or overt) within the embedded clause.

→ And is the received picture applicable cross-linguistically? No. (This talk)

---

1 All Navajo data not otherwise attributed here is due to Ellavina Perkins. I thank her for her patience and insight. This project has benefitted from discussion with Rajesh Bhatt, Seth Cable, Angelika Kratzer, Peggy Speas, and Maribel Romero. Any remaining errors are my own.

2 Abbreviations in glosses: ATT: ‘attitude’; IMPF: imperfective aspect; PROSP: prospective aspect; LOC: locative; NEG: negation; NEUT: neuter aspect; OPT: optative; PERF: perfective aspect; PST.ENC: past enclitic; SUB: subordinator. 1poss: 1st person possessive pronoun; 2S: 2nd person subject; 3O: 3rd person object.
→ Radical evidence from Navajo for a decompositional analysis:

- Navajo does not have different verbs with meanings like English think, want, and wish.
  - There is just one general attitude verb (nízin), glossed below as ATT which occurs in Navajo sentences translated into English with think, want, and wish.
    * I will show via the results of truth/felicity judgment tasks (Matthewson 2004) that Navajo sentences like those in (4) have truth/felicity conditions comparable to their English translations.
      - For short, I will say, e.g., that a sentence like (4a) is a “nízin sentence with a think interpretation.”

(4) a. Hastiin nahaltin sha'chin nízin.
   man 3S.rain.IMPF MODAL 3S.ATT
   ‘The man thinks it is raining.’

b. 'Atoö' biil 'adeeshił nisin.
   stew 3O.with.1S.eat.PROSP 1S.ATT
   ‘I want to eat stew,’ ‘I think I will eat stew.’

c. Shideezhi Hoozdogóó donéél nít'éé' nisin.
   1poss.little.sister California.to 3S.move.PROSP PAST 1S.ATT
   ‘I wish my younger sister had moved to California.’

- The interpretation of nízin sentences is correlated, at least in part, with morphology (tense, aspect, or particles) in the complement.

Goals for this presentation:
1. Determine what pieces of meaning are contributed by which pieces of morphology.
2. Sketch a decompositional analysis of sentences with nízin.
   - The theoretical analysis focuses on think and want sentences.
3. Where else could a nízin-style analysis work?

2 The puzzle: One verb with different interpretations?

- We claimed above that sentences with nízin can receive interpretations comparable to sentences with English verbs think, want, and wish.
- It is also possible to construct sentences with nízin that are ambiguous between (at least some) of the interpretations listed above.

---

3 Speakers were presented with detailed scenarios (presented in written and oral form) and asked to provide Navajo sentences appropriate as continuations to each scenario. Speakers were also asked to judge the goodness of constructed Navajo sentences within each scenario.

4 The verb nízin, along with ni ‘say’, is unique among Navajo verbs in allowing (and sometimes requiring) indexical shift in its scope (Speas 2000). Furthermore, in contrast with other clause-embedding verbs in Navajo, complements to nízin (and ni) never have an overt complementizer.
A string like (5) has either a think or a want interpretation depending on the context:

(5) 'Atoo' bil 'adeshił  nisin.
    stew 3O.with.1S.eat.PROSP 1S.ATT
    'I want to eat stew,' 'I think I will eat stew.'

- Given an appropriate context, strings of the form ‘\( \varphi, \neg \varphi \)’ are acceptable:

(6) a. Context: Kii is supposed to help his father put up a fence this afternoon. If it rains, Kii knows that he will be allowed to play inside instead of working. So, Kii wants it to rain. However, Kii looks outside and sees that the sky is completely clear: he thinks it will not rain.

    Kii neg 3S.rain.PROSP NEG 3S.ATT but 3S.rain.PROSP 3S.ATT
    Primary consultant: ‘Kii doesn’t think it will rain but he wants it to.’
    Comment by other woman in the office who did not hear the context: “That’s funny - I thought you were saying ‘Kii doesn’t want it to rain but he thinks it will.’”

- Strings like (5) are ambiguous. They are not vague. For a given instance of (5) in some context, only a think or a want interpretation is available:

(7) 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 has made sure not to watch any coverage of the election. So, while Kii wants Obama to win, he has no idea what election result to expect.

b. #Ron doó Kii Obama hodínoóthéeł nizin.
    Ron and Kii Obama 3S.win.PROSP 3S.ATT
    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.”

- However: The full complement of ambiguity (i.e., think, want, and wish interpretations) is not available to just any string with nizin.

- We will see in the next sections that the presence of certain material in the complement can force a particular interpretation, or is required for a particular interpretation.

* E.g., the epistemic modal sha’shin (Willie 1996) forces a think interpretation in (8).

(8) Kii ninááhodooltįįł sha’shin nizin.
    Kii 3S.again.rain.PROSP MODAL 3S.ATT
    ‘Kii thinks it will rain,’ Not: ‘Kii wants it to rain.’

- I explore the role of particular morphemes in the complement more below.
→ A polysemy hypothesis?

- Given the data outlined above, a simple first hypothesis would be one of polysemy, such that we posit (at least) two forms of \textit{nizin}, e.g., ‘think’-\textit{nizin} and ‘want’-\textit{nizin}.
  
  - This is not an appealing analysis for \textit{nizin}.

- The table below shows forms of \textit{nizin} for different persons and two different aspects (imperfective and perfective):

<table>
<thead>
<tr>
<th>Subject</th>
<th>Imperfective</th>
<th>Perfective</th>
</tr>
</thead>
<tbody>
<tr>
<td>1s</td>
<td>nisin</td>
<td>nizii’</td>
</tr>
<tr>
<td>2s</td>
<td>ninizin</td>
<td>ninizi’</td>
</tr>
<tr>
<td>3s</td>
<td>nizin</td>
<td>nizii’</td>
</tr>
<tr>
<td>1pl</td>
<td>niidzin</td>
<td>niidzi’</td>
</tr>
<tr>
<td>4</td>
<td>jiniizin</td>
<td>jiniizi’</td>
</tr>
</tbody>
</table>

- All of the entries in the table above can potentially be used in sentences where they are translated as \textit{think}, \textit{want}, or \textit{wish}.
  
  - There are no morphological differences in the embedding verb itself that are correlated with different interpretations.

- Homophony across so many different forms would be completely unexpected for Navajo.

- It is true that there are homophonous Navajo verb roots with radically different meanings, e.g. \textit{béézh} ‘to boil’ vs. \textit{béézh} ‘to be wide.’
  
  - However, these roots always compose with different derivational prefixes such that the final forms of verb words are not only not identical but bear little resemblance to each other.

- Furthermore, there are cases of a single verb root appearing two different verb words with different meanings, as with the root \textit{zééh} ‘to move as a group’ appears in (9):

(9) a. ‘anázééh ‘(the crowd) moves out of sight’
    b. dizééh ‘(the crowd) starts to move along’

- However, as can be seen by morphological differences between the two verbs in (9), the differences in these verbs’ meanings is necessarily indicated by different derivational prefixes.

→ Conclusion: There is one verb \textit{nizin}.

- Since there is just one verb \textit{nizin}, it cannot on its own determine the interpretation of a given string.

- The shape of the complement of \textit{nizin} seems to play a role in determining the meaning of the sentence as a whole.

→ The next subsections outline which morphology is key to which interpretations.
2.1 **Think**

- Like English *think*, *nizin* can be used in sentences where the subject is making a guess or prediction ((10)). I will say they are *nizin* sentences with a *think* interpretation.

(10)  
- **Context**: Every Friday night, Kii’s mother makes stew for dinner. Today is Friday. You ask Kii what he is eating for dinner. Kii says to you,

b. 'Atoo' bil ’adeeshiįį  
   * (sha’šhin) nisin.
   stew 3O.with.1S.cat.PROSP MODAL 1S.ATT
   ‘I think I will (probably) eat stew.’
   *Comment: “You can have sha’šhin here, if you want. It’s optional.”*

- The consultant reported that the epistemic modal (e.g. *sha’šhin*) was optional.\(^5\)  
  * Although the presence of an epistemic modal forces a *think* interpretation, this interpretation does not require any special overt morphology.

  - The verb can be marked for any aspect (prospective aspect in (10), imperfective, perfective, and neuter imperfective in (11)).

(11)  
- a. Shizhé’é  ’asdzą́ läi’  ’ayóo ’áyo’ní  nisin.
   1poss.father woman INDEF very 3O.3S.love.IMPF 1S.ATT
   ‘I think my father loves a certain woman.’  
   *Comment: “You can have sha’šhin here, if you want. It’s optional.”*

b. Hastiin lééchąą’í  nisin.
   man dog 2O.3S.bite.PERF 3S.ATT
   ‘The man thinks the dog bit you.’
   *(Platero 1978)*

c. K’ad tl’óodi  ’ayóo deesk’aaz  nisin.
   now outside very 3O.3S.cold.NEUT 1S.ATT
   ‘I think it’s very cold outdoors now.’  
   *(Young and Morgan 1987: d655)*

2.2 **Wish**

- There are two main classes of *wish* constructions. I take them each in turn.

1. **Particles**: *laanaa* and *lágo*:

(12)  
- a. Kii naňóta’  laanaa nizin.
   Kii 3S.rain.PERF WISH 3S.ATT
   ‘Kii wishes it would rain.’

b. Nahóntá’  laanaa nisin.
   3S.rain.OPT WISH 1S.ATT
   ‘I wish it would rain.’  
   *(Young and Morgan 1987)*

\(^5\)These particles seem to only have epistemic interpretations. Circumstantial meanings (ability, law, etc.) are expressed with other constructions (Willie 1996, Bogal-Allbritten 2013a,b).
(13)  a. Alice nahóltáā’ lágo nízin.
   Alice 3S.rain.OPT NEG.WISH 3S.ATT
   ‘Alice hopes it won’t rain.’

   b. Yiskáago nahóltáā’ lágo nisin.
   tomorrow 3S.rain.OPT NEG.WISH 1S.ATT
   ‘I hope it does not rain tomorrow.’

   (Young and Mogan 1987: d280)

   • Note that there is no negation (doo...da) in the sentences in (13). Any negative quality
   comes from lágo itself. However, this particle is only used in expressions of negative
   desire: it is not otherwise a negation marker.

2. Combination of past marker and prospective aspect:

   • Although Navajo is primarily an aspect-marking language, it also has two markers that follow
   verbs and locate the event time prior to the utterance time:
   – The particle nít’éé’:

   (14) 'Asháą
   1S.eat.IMPF PAST
   ‘I was eating.’

   • The enclitic (y)éę, a relativizer used when the action occurred in the past:

   (15) hooghan 'ishlāa=yeę
      hogan 3O.1S.build.PERF=PST.ENC
      ‘the hogan that I built.’

   (Young and Morgan 1987: d757)

   • If the past marker is nít’éé’ (also sometimes nít’éé’), the desire is about the past:

   (16) a. Context: Last year, your younger sister had a job opportunity arise in California
      but she did not move to California. Now, your younger sister is unhappy at home
      and you wish she would have moved to California.

   b. Shideezhí Hoozdogóó donéél nít’éé’ nisin.
      1poss.little.sister California.to 3S.move.PROSP PAST 1S.ATT
      ‘I wish my younger sister had moved to California.’

      Comment: “She should have moved.”

   • The combination of prospective-marked verbs and the marker nít’éé’ also appears in the con-
   sequents of counterfactual conditionals, discussed by Smith et al. (2007).
   – Past + ‘future’ is a common strategy for forming counterfactuals cross-linguistically

   (17) Shiyé’ ‘ázée’ bąąh ‘ályaa=go ch’i’dooldíįįł nít’éé’.
      my.son medicine 3.on 3S.make.IMPF=SUB 3S.survive.PROSP PAST
      ‘If my son had been treated with medicine, he would have survived.’
If the past marker yęę is instead used, the desire is about the present \((18)\)...

\[(18)\] Hoozdodi nighan doo yęę nisin.
California.LOC 2S.live PROSP PST.ENC 3S.ATT
'I hope you are living in California.'

Comment: “You can say if this if you’re about to visit California and also want to see a friend, but don’t know if that’s where they’re living now.”

...or future \((19)\):

\[(19)\] a. Context: Kii is supposed to help his father put up a fence this afternoon. If it rains, however, Kii will not have to work. So, Kii wants it to rain. But Kii sees that the sky is completely clear: it does not look like it’ll rain. Kii says to you,

b. Nahodooltįįɬ=ęę nisin.
3S.rain.PROSP=PST.ENC 1S.ATT
'I hope it will rain, I wish for it to rain.'

There are no other ways to express desires about the past and present. There is, however, another way to express desires about the future...

2.3 Want

When nizin embeds a complement containing a prospective-marked verb, the consultant could also translate nizin as want:

\[(20)\] a. Context: Ron is required to teach two days a week every semester. His wife knows this. Ron his asking his wife for her preferences about when he should teach next semester. She says to him, (Scheffler 2008)

b. Doo ndiilnish da nisin.
NEG 2S.work.PROSP NEG 1S.ATT
'I don’t want you to work.'

The context in \((20)\) is designed to make sure that sentences in which nizin is translated with want are interpreted with the truth/felicity conditions familiar from (at least) English want.

- It seems this is the case.

---

\(\text{6}^{\text{The postverbal particle doo is a shortened form of dooleel, which is a particle used to mark prospective aspect for verbs that do not have special prospective-marked verb stems. Smith et al. (2007) report no semantic differences between the two ways of marking prospective aspect.}}\)
The *want* interpretation **only** arises if the complement contains a prospective-marked verb.

(21)  
   a. **Context:** You are an adoption counselor. You are talking to a woman (Sally) who gave her infant son up for adoption 20 years ago. Sally has not seen her son since the adoption, so she has no idea what her son looks like. You and Sally are talking about what Sally wants for her son to be like now.
      
      b. #Sally shiyáázh nineez doo(leeł) nizin.
         Sally 1poss.child 3S.tall.IMPF PROSP 3S.ATT
         Intended: ‘Sally wants her son to be tall (currently).’
         **Comment:** “You can’t say that here. It’s about the future.”
      
      c. #Sally shiyáázh nineez nizin.
         Sally 1poss.child 3S.tall.IMPF 3S.ATT
         Intended: ‘Sally wants her son to be tall (currently).’
         **Comment:** “You’re saying she thinks he’s a tall person, because she and the father are tall, maybe. She’s guessing about it.”

   • Prospective aspect seems to make its expected temporal contribution: the desire expressed in this construction concerns an event happening in the future.
      
      – (21b) fails because the desire in the context is **not** about the future.
      – (21c) fails because in the absence of prospective aspect, a *want* interpretation is not available.7

   • Even when the time of the desire itself is in the past — as in (22) — prospective aspect still seems to locate the event time of the desired event after the time of the desire:
      
      (22) Hitler wołyêhqe nahasdzián t’áá dah s’iáá åt’êé’ binant’á’i deeshleel
         Hitler 3S.call.PAST.ENC world all.of.it its.ruler 1S.be.PROSP
         nizií’. 3S.ATT.PERF
         ‘Hitler wanted to become the master of the entire world.’
         (Young and Morgan 1987: 715)

---

7 In this context, the consultant suggested the prospective+yeq construction:

(i) Sally shiyáázh nineez doo(leeł) yeq nizin.
    Sally 1poss.child 3S.tall PROSP PAST.ENC 3S.ATT
    ‘Sally hopes her son is tall.’
3 Answering the puzzle: One verb, different complements

3.1 Where we find ourselves

→ What we have seen:

• At least Navajo nizin translated with think and want have semantics quite similar to their English translations (I set wish constructions aside for now).
  
  – As such, I’ll assume a Hintikkan modal semantics for sentences with nizin:

\[(23)\]
\[a. \quad [\text{Alice thinks that it is raining}] = \forall w' \in \{w' : w' \text{ is a world consistent with Alice’s beliefs in } w\} : \text{rain}(w')\]
\[b. \quad [\text{Alice wants for it to rain}] = \forall w' \in \{w' : w' \text{ is a world consistent with Alice’s desires in } w\} : \text{rain}(w')\]

• There seems to be only one verb nizin.

• In some cases, overt morphology in the complement forces a particular interpretation of a nizin sentence.
  
  – For instance, the presence of the epistemic modal sha’shin forced a think interpretation of nizin sentences.

• However, we also saw that strings like the following are potentially ambiguous between think and want interpretations:

\[(24)\] ‘Atoo’ bil ’adeeshi|ł nisin.
   stew 3O.with.1S.eat.PROSP 1S.ATT
   ‘I want to eat stew,’ ‘I think I will eat stew.’

  – This shows us that no additional overt morphology is needed to obtain the think or want interpretations.

→ I propose that:

• There is one verb nizin.

• Material in the complement to nizin determines whether the sentence as a whole has a think or want interpretation.
  
  – I explore in the next section the semantics of nizin and the semantics of the material in the complement.

→ I argue in the next section that a decompositional analysis (following analyses by Kratzer (2006, 2013) and Moulton (2009)) allows us to capture the observations made above.
3.2 Detour: Decomposing in English

- English see poses a challenge similar to the one posed by nizin. Moulton (2009) looked at sentences with perception verbs like (25):

  (25)  
a. Alice saw Fred driving too fast (but she believed he wasn’t).
  b. Alice saw Fred to be driving too fast (# but she believed he wasn’t).

- Examples like (25) show us that the complement to see is important in determining the interpretation of the sentence:
  - If the complement of see is a bare infinitival ((25a)), no belief is ascribed to Alice.
  - If the complement of see is an exceptional case-marking (ECM) infinitive ((25b)), a belief is ascribed to Alice.

- This is a general phenomenon, not a quirk of see: the pattern is repeated by other perception verbs (e.g. hear, smell).

- Moulton proposes that there is a single entry for see in the English lexicon. On the model of proposals in Kratzer (2006, 2013), he adopts an entry like the following for see.

  (26)  
  \[ \text{see} = \lambda s. \text{seeing}(s) \]

  - The verb see denotes a set of seeing situations \( s \).\(^8\)
    * A verb like hear would return a set of hearing situations \( s \).
  - The subject will be introduced by an additional functional head (Kratzer 1996).

- The ‘belief’ component present when see takes an ECM complement is introduced by an unpronounced belief modal in the complement, which I call here THINK.

  - I adopt Kratzer’s (2013) entry for the null modal in this position (I have renamed it THINK, from Kratzer’s SAY).\(^9\)

  (27)  
a.  
  \[ \text{THINK} = \lambda p. \lambda s. \forall w \in f_{\text{content}}(s) \rightarrow \exists s' \leq w \& p(s') \]  
  (adapt. Kratzer 2013a)

  b.  
  \[ \text{[THINK]} \text{ Fred is driving too fast ]} = \lambda s. \forall w \in f_{\text{content}}(s) \rightarrow \exists s' \leq w \& \text{drive.too.fast(Fred)(s')} \]
  Informally: The set of situations \( s \) such that in all worlds \( w \) compatible with the content of \( s \), there is a situation in which Fred is driving too fast.

- The modal THINK composes with a proposition \( p \).

  - The function \( f_{\text{content}} \) takes a situation \( s \) and returns a set of possible worlds compatible with the intentional content that characterizes \( s \) (Hacquard 2006, 2010; Kratzer 2006, 2013).

---

\(^8\)I am simplifying here: in order to account for its use in sentences like ‘Mary sees the cat,’ we should allow see to also take an entity as a direct object. Since this complicates the derivation slightly — and since I will be assuming a type \( \langle s,t \rangle \) entry for Navajo nizin — I abstract away from this.

\(^9\)See Moulton (2009) for his formulation of the modal.
* The function $f_{content}$ will only be compatible with situations that have this sort of intentional content associated with them; a situation of, e.g., *running* would not be compatible with $f_{content}$.

- Both the matrix verb and the ‘complement clause’ are of type $\langle s,t \rangle$.
  - The ‘complement clause’ is a modifier of the matrix verb, not an argument of it.
  - Like other sorts of modifiers, the ‘complement clause’ in (27) provides more information about the situation of seeing.
  
  - The verb *see* and the ‘complement clause’ compose via Predicate Modification:

    (28) a. $\lambda s.[\lambda s''.\text{seeing}(s'')](s) \&
          [\lambda s.\forall w \in f_{content}(s) \to \exists s' \leq w \& \text{drive.too.fast}(F \text{red})(s')](s) =$
    
    b. $\lambda s.\text{seeing}(s) \& \forall w \in f_{content}(s) \to \exists s' \leq w \& \text{drive.too.fast}(F \text{red})(s')$

- The external argument is introduced via the functional head in (29) (Kratzer 1996, 2006).

    (29) $[v_{poss}] = \lambda x.\lambda s.\text{possessor}(x)(s)$

- The functional head and *see*+complement clause compose via Situation Identification (i.e., Kratzer’s (1996) Event Identification), producing the expression in (30a).

  - After the subject (Alice) composes, the situation argument is existentially closed ((30b)).

    (30) a. $\lambda x.\lambda s.\text{seeing}(s) \& \text{possessor}(x)(s) \&$
          $\forall w \in f_{content}(s) \to \exists s' \leq w \& \text{drive.too.fast}(F \text{red})(s')$
    
    b. $\exists s.\text{seeing}(s) \& \text{possessor}(Alice)(s) \&$
    $\forall w \in f_{content}(s) \to \exists s' \leq w \& \text{drive.too.fast}(F \text{red})(s')$

    Informally: There exists a situation of seeing $s$ whose possessor is Alice.
    Situation $s$ is such that in all worlds $w$ compatible with the intentional content of $s$, there is a situation in which Fred is driving too fast.

### 3.3 Back to Navajo

- English clearly has two different lexical items, *think* and *want*.

  - As such, even within decompositional proposals like the ones above, they retain some particular lexical content:

    (31) a. $[\text{think}] = \lambda s.\text{thinking}(s)$
    
    b. $[\text{want}] = \lambda s.\text{wanting}(s)$

- However, we have seen that expressions of belief and desire in Navajo both involve *nizin*.

  - I argued above that material (overt or covert) within the complement is responsible for fixing the flavor of the sentence as a whole.
• **Proposal:** The verb *nizin* simply denotes situations of ‘mental attitude holding:’

\[(nizin) = \lambda s. \text{mental-attitude}(s)\]

- I propose that the difference between the *think* and *want* interpretations of *nizin* sentences is due to the functional morphemes defined below:

\[(33)\]

a. \[\text{sha’shin} / \emptyset_{\text{think}} = \lambda p. \lambda s. \forall w \in f_{\text{content}}(s) \rightarrow \exists s' \leq w \& p(s')\]

b. \[\emptyset_{\text{desire}} = \lambda p. \lambda s. \forall w \in f_{\text{desires}}(s) \rightarrow \exists s' \leq w \& p(s')\]

### 3.3.1 Putting together a *think* construction

- I illustrate with the following sentence:

\[(34)\]  
\[\text{Kii nahoodoltï}l nizin.\]
Kii 3S.rain.PROSP 3S.ATT
‘Kii thinks it will rain.’

- The composition of the pieces largely follows the path taken by *see* and ECM complements.

- The only difference that I’ll assume here is that composition with the subject-introducing head — and then the subject — happens before *nizin* and the ‘complement clause’ compose.

  - I do this for Athabaskan-internal reasons: the subject occurs closer to the verb stem, so perhaps this tells us something about the order of composition.

\[(35)\]

**Introduction of subject via Situation Identification:**

a. \[\text{[\text{v.poss}] + [nizin]}(\text{Kii}) =\]

b. \[\lambda x. \lambda s. \text{possessor}(x)(s) \& \text{mental-attitude}(s))(\text{Kii}) =\]

c. \[\lambda s. \text{possessor(Kii)}(s) \& \text{mental-attitude}(s)\]

- The null operator \(\emptyset_{\text{think}}\) uses the function \(f_{\text{content}}\).

  - When it appears as part of the \(\emptyset_{\text{think}}\) operator, the function \(f_{\text{content}}\) applies to a mental attitude situation \(s\) and returns the set of worlds compatible with a particular kind of intentional content in \(s\), namely the propositions believed to be true by the attitude holder in that situation.

\[(36)\]

**Composition of complement clause via Function Application:**

[\[\emptyset_{\text{think}} \text{ It will rain} = \lambda s. \forall w \in f_{\text{content}}(s) \rightarrow \exists s' \leq w \& \text{will.rain}(s')\]

*Informally:* The set of situations \(s\) such that in all worlds \(w\) compatible with the content of \(s\), there is a situation \(s'\) in which it goes on to rain.
• As before, both the matrix verb and the complement clause are of type \(\langle s,t \rangle\). Composition is as shown in (37):

\[(37)\] **Composition of nizin and complement clause via Predicate Modification:**

a. \(\lambda s. [\lambda s. \text{possessor(Kii)}(s) \& \text{mental-attitude}(s)](s)\)

\[\& [\lambda s. \forall w \in f_{\text{content}}(s) \rightarrow \exists s' \leq w \& \text{will.rain}(s')] (s) =\]

b. \(\lambda s. \text{possessor(Kii)}(s) \& \text{mental-attitude}(s)\)

\[\& \forall w \in f_{\text{content}}(s) \rightarrow \exists s' \leq w \& \text{will.rain}(s')] (s)\]

• Existential closure applies to the situation argument \(s\):

\[(38)\] \(\exists s. \text{possessor(Kii)}(s) \& \text{mental-attitude}(s) \& \forall w \in f_{\text{content}}(s) \rightarrow \exists s' \leq w \& \text{will.rain}(s')] (s)\)

*Informally:* There exists a situation of mental attitude \(s\) whose possessor is Kii. Situation \(s\) is such that in all worlds \(w\) compatible with the content of \(s\), there is a situation in which it goes on to rain.

### 3.3.2 Considering the desire operator

• I illustrate the \textit{want} construction with (39):

\[(39)\] Kii nahoodool\(\tilde{\text{i}}\text{ĭl} nizin.

Kii 3S.rain.prosp 3S.att

‘Kii wants it to rain.’

• The \textit{want} interpretation indicates to us that the sentence contains the null desire operator:

\[(40)\] \([\emptyset_{\text{desire}}] = \lambda p. \lambda s. \forall w \in f_{\text{desires}}(s) \rightarrow \exists s' \leq w \& p(s')\]

– Instead of \(f_{\text{content}}\), the operator \(\emptyset_{\text{desire}}\) contains the function \(f_{\text{desire}}\). This function applies to a mental attitude situation \(s\) and returns the set of worlds compatible with a different sort of intentional content in \(s\): namely, the desires held in \(s\).

• Composition proceeds exactly as for the \textit{think} interpretation:

\[(41)\] \([([38])] = \exists s. \text{possessor(Kii)}(s) \& \text{mental-attitude}(s) \& \forall w \in f_{\text{desires}}(s) \rightarrow \exists s' \leq w \& \text{will.rain}(s')] (s)\)

*Informally:* There exists a situation of mental attitude \(s\) whose possessor is Kii. Situation \(s\) is such that in all worlds \(w\) compatible with desires held in \(s\), there is a situation in which it goes on to rain.

• It seems that the operator \(\emptyset_{\text{desire}}\) selects for complements with prospective-marked verbs.

– This behavior is expected:

* Expressions of desire are usually put into the category of ‘circumstantial’ modals.

* Other overt circumstantial modals (e.g., ability and law modals) select for complements with prospective-marked verbs.

- Is a desire operator too specialized?
  - The operator ∅_thinks covers the ground of an epistemic operator, so why not have a more general circumstantial modal operator which quantifies not only possible worlds in which certain desires hold, but where goals or laws hold.
  * Rubinstein (2012): There is not a clear line between different types of circumstantial modality (e.g., bouletic, teleological, etc.). A single circumstantial modal can take into account priorities of different kinds.
  - To test: Can nizin plus this operator be used where the subject does not desire to do something, but needs to do it given some goal (e.g., following the law)?

(43) a. City regulations mandate that home owners put up fences between their properties. You and your neighbor get along very well without a fence. In fact, both of you object to a fence because it would have to go right on top of the beautiful flower beds that have been flourishing between your two properties. You say to your neighbor: (Rubinstein 2012)

b. 'Adidesht’ih nisin.
1S.build.a.fence.prosp 1S.ATT
(Intended: 'I need to build a fence.‘)

3.3.3 What about wishes?

- Recall that there are two major classes of nizin constructions expressing desire: want and wish constructions.

- The account with the null operator ∅_desire gives us, at least, a first pass at the semantics of the want construction in Navajo.

- We could imagine that the same operator is used in the wish constructions involving past and prospective morphology in the complement. But what role is played by past markers?
- The literature has addressed the role of future and past in counterfactual conditionals and wishes (Iatridou 2000, Copley 2002, Ippolito 2008, and Arregui 2009, a.o.).

I'll assume for the time being that laanaa and lágo are operators that encode a wish meaning on their own.
• The contribution of past morphology in wishes may be clarified if more work is done to compare want and wish constructions.

  – We’ve already seen that the wish construction in (43b) can be about present or future situations, while the want construction can only be about the future.

  – Focusing just future wishes with want constructions, consultant responses to sentence-context pairs suggested that:

    * The wish construction might be preferred where the speaker believes the situation is unlikely (e.g., where Sally believes her son is unlikely to be tall).

4 Conclusions and applications of decomposition

• Conclusions:

  – The ‘received view’, in which the embedding verb is the modal expression, does not seem ideal for Navajo.

  – There is one entry for the verb nizin:

    (44) \[nizin\] = \(\lambda s.\text{mental-attitude}(s)\)

  – Complements with different modal operators, two of which are:

    (45) a. \([sha’shin / \emptyset_{\text{think}}] = \lambda p.\lambda s.\forall w \in f_{\text{content}}(s) \to \exists s' \leq w \land p(s')\]

    b. \([\emptyset_{\text{desire}}] = \lambda p.\lambda s.\forall w \in f_{\text{desires}}(s) \to \exists s' \leq w \land p(s')\)

  – Navajo provides evidence that in some languages, attitudes can be decomposed into a light embedding verb and a complement that contains (familiar, independently motivated) functional elements.

• Research question: What other phenomena can be explained in terms of a decompositional analysis that uses pieces of meaning like these?

  – Navajo, other Athabaskan languages, and English expect.

→ Other verbs like nizin in Navajo:

• The verb of speech ni is similar to nizin in several respects:

  – Like nizin, the clausal complement to ni lacks an overt complementizer and exhibit indexical shift (Speas 2000).

Neither particle above requires the complement to contain prospective-marked verbs, so it seems like we are not dealing with an instance of \(\emptyset_{\text{desire}}\).

(i) a. Kii nahoťt’’ laanaa nizin.  
    Kii 3S.rain.PERF WISH 3S.ATT  
    ‘Kii wishes it would rain.’

b. Alice nahoťt’’ lágo nizin.  
    Alice 3S.rain.OPT NEG.WISH 3S.ATT  
    ‘Alice hopes it won’t rain.’
Young and Morgan (1987) contains examples where the verb ₙⁱ is translated as want:

\[(46)\] Sha’áłchíní dibé ’átso nihaa nahidoonih dajíni.

1poss.family sheep all 3O.3S.sell.PROSP 3plS.say

‘My family wants to sell all the sheep.’

- Perhaps in (46), the clausal complement to ₙⁱ contains the operator ₀ₜₐₛₑₚₑᵣₑ.
- The verb ₙⁱ could denote situations of speaking:

\[(47)\] \([ₙⁱ] = λₚₛₑₚₑᵣₑ(s)\]

- As before, the situation s taken as argument by the matrix verb would be shared by the complement clause, which would provide more information about that situation s.
- The function ƒₜₐₛₑₚₑᵣₑ would apply to s and return the worlds consistent with the desires that were expressed in that situation of speaking (e.g., ‘We want to have no more livestock,’ ‘We want to make some money,’ etc.).

→ Similar constructions in other Athabaskan languages:

- A preliminary survey of grammars turns up similar phenomena — described to greater or lesser degrees — in Slave (Rice 1989), Koyukon (Jetté and Jones 2000), Witsuwit’en (Hargus 2007), and Ahtna (Kari 1990).
- Rice (1989) on Slave: ‘The verb bases are translated into English in a variety of ways. These include ‘want’, ‘think’, ‘hope’, and ‘believe’. These different meanings are distinguished primarily by the mode found in the complement sentences’ (1989: 1293).
- Slave seems to use optative verbal morphology wherever Navajo used prospective aspect.
- Near minimal pairs like (48b,c) seem to show that when the complement contains an optative-marked verb, either a think or want interpretation is available:

\[(48)\]

a. Qeyi dene yedaréhyee yenįwę.

that person 1S.smart.IMPF 3S.ATT

‘That person thinks that he is smart.’

b. Hįdowedzįnę k’e deshiṭa duhshá yerehwę.

tomorrow on bush 1S.go.OPT 1S.ATT

‘I’m thinking of going to the bush tomorrow.’

c. Deshiṭa duhshá yerehwę.

bush 1S.go.OPT 1S.ATT

‘I want to go to the bush.’

\[11\] Interestingly, other Athabaskan languages — even ones quite closely related to Navajo, like San Carlos Apache (de Reuse 2006) — use two very different verbs to express belief and desire. Verbs with meanings like ‘to like’ seem frequent candidates for expression of desire.
A decompositional analysis for English *expect*

- When we look at them initially, English attitude verbs like *think* and *want* do not as obviously require a decompositional analysis: there seem to be two lexical items that we could imagine retain the modal meanings familiar from the ‘received view.’\(^{12}\)

  - However, the English verb *expect* may be a good candidate for a Navajo-like analysis.

- Bresnan (1972) (also Pesetsky 1991, Wurmbrand 2014) observes that sentences like (49) are ambiguous between the three readings shown below:

  (49) Mary expects her sister to be home by 8 PM.

  (50) *Believe* reading: Mary’s sister gets tired easily and hates to stay out past 8 PM or so (although Mary does not care when her sister comes home). Her sister has been out all day. I say of Mary, (49).

    Paraphrase of (49): Mary believes (on the basis of evidence available to her) that her sister will be home by 8 PM. Mary might not care about her sister’s actions.

  (51) *Require-of* reading: Mary is in charge of her sister’s comings and goings. She has imposed an 8 PM curfew on her sister. Mary knows, however, that her sister often disobeys her and will probably come home quite late. I say of Mary, (49).

    Paraphrase of (49): Mary is imposing on order on her sister that she be home by 8 PM. In order to follow Mary’s rules, what her sister *ought to do* is come home by 8 PM. Mary might not believe that this is likely to actually happen.

  (52) *Want* reading: Mary is seeing her little sister off on her first date. Mary’s sister has an 8 PM curfew. Her date will be driving, so it is really her date who is responsible for bringing her home on time. I know that Mary wants her sister’s date to bring her home by 8. I say to the date, (49).

    Paraphrase of (49): Mary is imposing an order on someone else to make sure that her sister is home by 8 PM. Her sister might have no agency over this; Mary may or may not believe that this is likely to actually happen.

- The existence of these particular three interpretations for *expect* sentences is not arbitrary. Each corresponds to a different flavor of modality:

  - The *believe* meaning is epistemic in nature: the felicity of *expect* depends on what the subject believes will happen given available evidence.

  - The *require of* meaning is close to circumstantial modality, in particular *ought-to-do* deontic modality (Feldman 1986, Hacquard 2006) exemplified in (53).

(53) Wickham ought to apologize. \(^{(Hacquard 2006: 40)}\)

    Obligation placed on Wickham: What he ought to do (in order to fulfill my desires, the law, etc.) is apologize.

\(^{12}\)See Kratzer (2006, 2013) for discussion of why a decompositional analysis is still desirable for such verbs.
The want meaning of expect is a slight misnomer. It actually seems to be linked to Hacquard and Feldman’s ought-to-be class of deontic modals.

* These modals impose an obligation on some third party (e.g., the addressee, society at large, etc.) as in (54):

(54) Murderers ought to go to jail.  
(Obligation placed on society: It ought to be that murderers go to jail.)

• Perhaps expect is like Navajo nizin:

– The complements to expect can contain:
  * An epistemic modal
  * A circumstantial modal
  * An ought-to-be deontic modal

• What core meaning should we attribute to expect?

---

Take away messages from the analysis of nizin sentences:

• Navajo sentences with nizin initially look typologically rather unfamiliar, if we start with the ‘received’ view.
• I have proposed that a decompositional analysis for nizin is fitting given the observations made so far.
• The analysis of nizin provides a strong piece of support for decompositional analyses of clause-embedding verbs, while also providing first steps towards analyses of constructions from better represented languages.

---

References