

The semantics of the future in Navajo*

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1. Introduction

In contrast to descriptions of past or present states of affairs, descriptions of future states of affairs are displaced from the actual world and settled truths. An English sentence with *will* like (1) makes a prediction that an event (Mary's arrival) will take place in the future (after speech time). The interpretation of such sentences may be influenced not only by the present circumstances of the world but also by rules, goals, and so on. In light of current circumstances and other factors salient in the context, the speaker predicts that Mary will return home at 8PM.

- (1) Mary will be home at 8PM...
 ...since her train is arriving now.
 ...if she wants to obey her curfew.

A key question is how languages relate future temporality and modality. Even for English, this proves to be a challenging question. Most authors posit entries for English *will* that combine temporal and modal meaning (Thomason 1984, Abusch 1985, Enç 1996, Copley 2002, Condoravdi 2003, Klecha 2014). However, other authors propose to decouple modal or temporal content from *will*. Prior's (1967) analysis of *will* as a simple tense marker is elaborated by Kissine (2008). However, English *will* also occurs in sentences that express non-future epistemic (2a) or dispositional modal meanings (2b). Such data lead some authors to propose that *will* is a modal that does not entail future time; apparent temporal properties of *will* are the result of independent constraints (Condoravdi 2002, Kaufmann 2005, Werner 2006; cf. Bennett & Partee 1978).

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The judgments in this paper were elicited following the methodological practices outlined by Matthewson (2004). English translations of Navajo sentences in isolation (e.g. sentences from Young & Morgan 1987) were only used as initial clues about the meaning of future-marked verbs: translations out of context were not treated as direct semantic evidence. I investigated the meaning of individual sentences by eliciting judgments about the felicity and truth of sentences when presented in contexts designed to target a particular interpretation. In initial elicitation sessions, consultants were asked to read a context (presented in English) and to translate a target sentence from English to Navajo. All consultants were fully fluent and literate in both Navajo and English. In later sessions, I presented consultants with the previously elicited Navajo sentences in constructed contexts and asked whether the sentence sounded like something a fluent Navajo speaker might say in the context as given. Consultants often offered insightful follow-up comments in addition to judgments; some of these comments are presented below. Examples that are not otherwise cited should be understood as having been elicited.

3. The morphology of Navajo future marking

Navajo is a polysynthetic language that is well-known for the morphological and semantic complexity of its verbs. Verbs that describe events (as opposed to states) indicate how the described event relates to time via the morphological shape of the verb stem (rightmost syllable) and, in some cases, prefixes. The Athabaskan literature refers to these morphological characteristics as the ‘mode’ of a verb word. Mode marking can indicate viewpoint aspect (imperfective, perfective, progressive) as well as the notion of futurity explored here (Smith 1996; Smith, Perkins, and Fernald 2007). A given verb is marked for only one mode at a time. The verbs in (4) compare a verb marked for Imperfective Mode with a verb marked for Future Mode; morphology associated with each mode is underlined. Verbs marked for Future Mode typically bear the prefix *di* and the verb stem frequently ends in *ł*.

- (4) a. ch'í'níshkóq̄h Imperfective Mode
ch'í' = ni = sh = l = kóq̄h
out.horizontally = ni.IPFV = 1 SBJ = voice/valence = swim.IPFV
'I am swimming out horizontally.'
- b. ch'í'deeshkóq̄ł Future Mode
ch'í' = di = sh = l = kóq̄ł
out.horizontally = di.FUT = 1 SBJ = voice/valence = swim.FUT
'I will swim out horizontally.'

While imperfective and perfective viewpoint aspect can only be indicated by means of mode marking, futurity can also be marked by the analytic morpheme *dooleet*, sometimes shortened to *doo*. *Dooleet* is attested in two main environments. First, it is used to mark futurity for stative verbs, which do not permit different mode marking (5a) (Young & Morgan 1987, Smith et al. 2007). Second, *dooleet* can follow eventive verbs already marked for another mode, e.g. Perfective Mode in (5b).

- (5) a. Nisneez dooleet.
 1SBJ.tall FUT
 ‘I will be tall.’
- b. ’Íyáą’ dooleet.
 1SBJ.eat.PFV FUT
 ‘I will have eaten.’ (Young & Morgan (YM) 1987, d351)¹

I did not find any semantic differences that correlated with the use of Future Mode vs. *dooleet*. I refer collectively to verbs marked for Future Mode and verbs that co-occur with particle *dooleet* as ‘future-marked’ verbs.

4. The temporality of future marking in Navajo

In their account of the temporal interpretation of Navajo sentences, Smith et al. (2007) argue that verbs marked by the Future Mode or by the future particle *dooleet* express that the situation described follows speech time. For sentences with the future-marked verb in the main clause, this seems correct. Speakers only accepted sentences like (6) in contexts where the time of giving birth follows the time at which the sentence is uttered.

- (6) a. Context: The doctor tells you that he will induce labor in two days. You are telling me what will happen. You say:
- b. (Naaki yiskáago) ’adíłchííł.
 two day 1SBJ.give.birth.FUT
 ‘I will give birth (in two days).’

The default interpretation of future marking as relative to speech time is consistent with the behavior of other temporal markers in Navajo, according to Smith et al. (2007). When verbs occur in Imperfective Mode (imperfective viewpoint aspect), the default interpretation is that the event is ongoing at speech time:

- (7) Jáan Tségháhoodzání-di naaghá.
 John Window.Rock-LOC around.3SBJ.go.IPFV
 ‘John is hanging out at Window Rock.’ (Smith et al. 2007 (19a))

When verbs are marked for Perfective Mode (perfective viewpoint aspect), the default interpretation is that the event is completed by speech time:

- (8) Shimá ch’iyáán ła’ bá naháńii’.
 1POSS.mother groceries some 3OBJ.for 3OBJ.1SBJ.buy.PFV
 ‘I bought some groceries for my mother.’ (Smith et al. 2007 (19d))

¹Page numbers from Young & Morgan (1987) preceded by ‘d’ refer to pages in the dictionary section.

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- (10) a. Context: This morning, you saw dark clouds gathering in the distance. You predicted it would rain some time later in the day. At noon, it rained. This evening, you are telling me how your prediction turned out to be correct.
- b. Jíídáá' nahodootjíł niizíí'.
 today AREAL.SBJ.rain.FUT 1SBJ.attitude.PFV
 'I thought it would rain today.'

In (11), a subordinate phrase and the past particle *ńt'éeé* introduce a past reference time (time of medication): the time of (hypothetical) survival follows this past reference time.

- (11) Shiye' 'azee' baąh 'ályaa-go ch'í'doodjįł ńt'éeé.
 1POSS.son medicine 3OBJ.on 3SBJ.make.IPFV-SUB 3SBJ.survive.FUT PAST
 'If my son had been treated with medicine, he would have survived.'
 (Smith et al. 2007 (12a))

In summary, Navajo future-marked verbs can either be interpreted relative to speech time or relative to some salient reference time in the past. I conclude that the temporality of Navajo future marking corresponds to Abusch's (1985) proposed abstract English future marker, WOLL. The morpheme WOLL indicates that event time follows some reference time determined by covert present or past tense marking. The combination of present tense with WOLL yields *will* whereas the combination of past tense with WOLL produces *would*. Other languages that have been claimed to overtly instantiate WOLL with 'future' morphology include St'át'imcets (Matthewson 2006), Gitksan (Jóhannsdóttir & Matthewson 2007, Matthewson 2013), and Tlingit (Cable to appear).

Navajo future marking always encodes a temporal component, however. Navajo future-marked verbs necessarily describe situations that occur subsequent to some salient point in time (speech time or other reference time). This sets Navajo future marking apart from English *will*, which can be used in sentences that express non-future epistemic readings:

- (12) a. Context: It is 3 PM. You know Ted is always in the library at 3 PM. I ask where Ted is; you reply:
- b. #Ted naaltsos bá hogan góne' k'ad sidáa dooleeł.
 Ted book 3OBJ.for house inside now 3.SBJ.sit.IPFV FUT
 (Intended but unavailable: 'Ted will be in the library now.')
- Comment: "You're talking about what's going to happen."

Given the infelicity of (12), I conclude that the lexical entry for Navajo future marking necessarily orders the situation time after some other point in time (speech time or other reference time). However, this should not lead us to conclude that Navajo future marking has a 'purely temporal' interpretation with no modal component. I consider evidence for modal interpretations of Navajo future-marked verbs in the next section.

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and past particle *ńt'ée'* can express "failed obligation" (1996: 338). The future-marked verb in (15) describes an eventuality (washing the baby) that would have happened if the subject had met her obligations.

- (15) T'áá 'íídáá' 'awée' táázhhdoogis ńt'ée.
 just then baby 4OBJ.3SBJ.wash.FUT PAST
 'She should have washed the baby already.' (Willie 1996 (44))

Willie also gives examples in which future-marked verbs occur with particles *t'áá 'aaní'* or *t'áá 'íyisí'* 'just true, really' to express "obligation" (1996: 345):

- (16) Táá 'aaní díj' 'ashkii 'íídoołta'.
 just true today boy 3SBJ.go.to.school.FUT
 'The boy must go to school today.' (Willie 1996 (91))

More must be said about the relationship between obligation meaning and future-marking however. I found that the expression of obligation does not depend on the presence of particles *ńt'ée'*, *t'áá 'aaní'*, or *t'áá 'íyisí'*. The elicited sentence in (17) contains only a future-marked verb and still expresses obligation.

- (17) a. Context: My maternal grandfather is in poor health and it is unsafe for him to live alone at home. I think he ought to sell his house. I say to you:
 b. Shicheii bighan baa nahidoonih.
 1POSS.grandpa 3POSS.house 3OBJ.3SBJ.sell.FUT
 'My grandfather should sell his house.'

Future-marked verbs can also be embedded by attitude verbs. In (18), the embedding verb is perfective-marked. The embedded clause contains a future-marked verb but no particles.

- (18) a. Context: Mary is telling you about the roads in her hometown. She has not lived there for a long time, but she says that the roads were in bad shape and needed to be repaired when she lived there. She says:
 b. 'Atiin t'áá yá'adát'éeł-ígí' 'ádadoolníł niizí'.
 road 3PL.SBJ.good-NMLZ 3PL.SBJ.be.FUT 1SBJ.ATTITUDE.PFV
 'Mary thought the roads should get fixed (back then).'

"Obligation" alone seems an overly narrow characterization of the meanings available to future-marked verbs. The context in (19) seems to involve desires. Here, *shicheii* had a desire, rather than an obligation, to move.

- (19) a. Context: Last year, my grandfather had a chance to move to California, but he never moved. It had always been his dream to move to California. He died earlier this year. I tell you:

- (21) a. Context: My friend Bill is also trying to decide where to drive this weekend. He lives in Chinle. One place he might go is Tsaile. I know the only road from Chinle to Tsaile is Route 64. I say to you that Bill has to take Route 64.
- b. Bill Tsailegóó déyáa-go, 65 'atiingóó bił 'adoolwoł.
 Bill Tsaile.to 3SBJ.go.IPFV-SUB 64 road.to 3OBJ.with 3SBJ.drive.FUT
 'To get to Tsaile, Bill has to take Route 64.'

To conclude the discussion of future-marked verbs and priority modality, I observe that while the examples above show that future-marked verbs can receive a necessity priority interpretation, we also have evidence that future marking is a necessary condition for this interpretation to arise in declarative sentences.⁶ If the future-marked verb is replaced with one that is imperfective-marked, the priority interpretation disappears.

- (22) a. Context: Bill is on his way to Albuquerque. I'm not sure what route he is taking: there are many roads to Albuquerque. However, I think that the best route is I40: it's the fastest and safest. I say to you that Bill should take I40.
- b. Bill Hoozdogóó déyáa-go, I40 'atiingóó bił 'adoolwoł
 Bill Phoenix.to 3SBJ.go.IPFV-SUB I40 road.to 3OBJ.with 3SBJ.drive.FUT
 / # bił 'oolwoł.
 3OBJ.with 3SBJ.drive.IPFV
 'To get to Phoenix, Bill should take I40.'
 Comment: "Bił 'oolwoł means he's on the way. It isn't about what is best."

5.2 Constant temporality, flexible modality

I propose that the Navajo future marker consists of two parts: a constant temporal component and a flexible modal component. I consider evidence both in turn below before positing an entry for the future marker.

First, the constant temporal component. As was first proposed in section 4, the temporal component encoded by Navajo future marking is consistent with proposals for abstract English future marker WOLL, realized either as *will* or *would* depending on the reference time. This is true regardless of whether the future-marked verb is interpreted as expressing predictions ((23a), (24a)) or priorities ((23b), (24b)). In the sentences directly below, reference time equals speech time. (23a) describes an event (birth) that the speaker predicts will

⁶I say 'declarative' sentences since Navajo forms imperatives with imperfective-marked verbs (i) as well as with future-marked verbs (not shown). Imperatives have been analyzed as involving a necessity priority modal (Portner 2007, Kaufmann 2014); I leave to future work how imperative meaning arises in (i).

- (i) Chidí bighandéé shá ch'íníłbaas.
 car 3POSS.house.from 1OBJ.for out.3OBJ.2SBJ.roll.IPFV
 'Drive the car out of the garage for me!' (YM 1987, d291)

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happen given how things stand at speech time. (23b) describes an event (Bill takes I40) that will happen if priorities (get to Phoenix quickly and safely) held at speech time are met.

- (23) a. (Naaki yiskáago) 'adííchííł.
 two day 1 SBJ.give.birth.FUT
 'I will give birth (in two days).' (context (6a))
- b. Bill Hoozdogóó déyáa-go, I40 'átiingóó bił 'adoolwoł.
 Bill Phoenix.to 3 SBJ.go.IPFV-SUB I40 road.to 3 OBJ.with 3 SBJ.drive.FUT
 'To get to Phoenix, Bill should take I40.' (context (22a))

In the sentences in (24), by contrast, reference time precedes speech time. (24a) describes an event (rain) that was going to happen given the speaker's evidence at a prior time. (24b) describes an event (roads get fixed) that would have happened if priorities (have safe roads) relevant in the past had been met.

- (24) a. Jíídáá' nahodoołtííł niizíí'.
 today AREAL.SBJ.rain.FUT 1 SBJ.attitude.PFV
 'I thought it would rain today.' (context (10a))
- b. 'Atiin t'áá yá'adát'ééh-ígíí 'ádadoolnííł niizíí'.
 road 3 PL.SBJ.good-NMLZ 3 PL.SBJ.be.FUT 1 SBJ.ATTITUDE.PFV
 'Mary thought the roads should get fixed (back then).' (context (18a))

We can now turn to the flexible modality that I posit for Navajo future marking. We have seen contexts in which Navajo future-marked verbs are variably translated into English with either *would/will* or priority modals *should, must*, and so on. I propose that this variation in translation is indicative of actual truth-conditional ambiguity in Navajo sentences with future-marked verbs: such sentences either express predictions or priorities as part of their basic truth-conditional meaning.

In support of this point, we can look at contexts in which priorities (what *ought* to happen) are in explicit conflict with predictions (what *will* happen). The following examples show that consultants were able to use future-marked verbs felicitously in such contexts, which indicates that future-marked verbs translated with priority modals are not simply 'predictions in disguise.' Furthermore, in such contexts consultants were able to conjoin clauses that contain future-marked verbs. In each example, the first clause expresses that some proposition *p* will happen if priorities are met while the second clause expresses that the same proposition *p* is predicted not to take place. If translated 'literally,' we might expect such conjunctions to be contradictory claims that *p* both will and will not happen.

- (25) a. Context: My grandfather is in poor health but lives alone at home. A health care worker has come in to assess the situation. She thinks my grandfather needs to sell the house but he has told her he absolutely will not sell. She tells me: 'Your grandfather needs to sell his house, but he's not going to do it.'

- b. Nicheii bighan baa nahidoonih, ndi doo 'adoolníł da.
 2POSS.grandpa 3POSS.house 3OBJ.3SBJ.sell.FUT but NEG 3SBJ.do.FUT NEG
 'Your grandfather needs to sell his house, but he's not going to do it.'
 Literal: Your grandfather will sell his house, but he's not going to do it.
- (26) a. Context: You and I are town inspectors. We visit towns and tell them what they need to fix, and what will be possible given their budgets. You think the roads in this town need to be fixed (for the sake of safety), but you have seen that the town is low on money and cannot afford it. You tell me: 'There need to be new roads, but I don't think it is going to happen.'
- b. 'Atiin t'áá yá'adát'ééhígíí 'ádadoolníł, 'ákondi doo 'ádadoolníł da.
 road 3PL.SBJ.good.NMLZ 3PL.SBJ.do.FUT but NEG 3SBJ.do.FUT NEG
 'There need to be new roads, but it's not going to happen.'
 Literal: There will be new roads, but there won't be.

The felicity of (25b) and (26b) indicates that future-marked verbs in Navajo are truth-conditionally ambiguous between expressing predictions and priorities. In other words, future-marked verbs can be used where the context makes it explicit that the described event is very unlikely to happen and where a translation with English *will* would be rejected.

5.3 An entry for future marking in Navajo

I propose that all instances of Navajo future-marked verbs bear the marker in (27). According to the this entry, Navajo future marking is a necessity modal with a temporal component that is consistent with proposals for modal future markers in other languages (Thomason 1984, Abusch 1985, Enç 1996, Copley 2002, Condoravdi 2003, Matthewson 2006, Tonhauser 2011, Klecha 2014). FUT takes as argument proposition *p* (corresponding to a fully inflected verb) and reference time *t*: there exists a time *t'* subsequent to *t* at which *p* is true.

$$(27) \quad \llbracket \text{FUT} \rrbracket = \lambda p. \lambda t. \lambda w. \forall w' : w' \in \text{MB}_{OS}(w)(t) \rightarrow \exists t' : t < t' \ \& \ p(w')(t')$$

Crucially, a modal entry can account for both prediction and priority interpretations of future-marked verbs. The modal component of (27) follows the framework for modals developed by Kratzer (1981, 2012), designed to capture the flexibility of 'flavor' for modal auxiliaries in English, German, and other languages. A modal's flavor depends on the worlds that make up its domain of quantification, the worlds returned by the modal base (MB), subsequently ranked by propositions in the ordering source (OS). Modals quantify over the worlds most consistent with the modal base and the ordering source.

Following work by Thomason (1984), Condoravdi (2002), Kaufmann (2005), and others, I would like to suggest that future-marked verbs receive a prediction interpretation when the future marker is interpreted as having a metaphysical modal base (Thomason 1984, Condoravdi 2002, Kaufmann 2005). The modal base returns worlds *w'* that have

histories identical to world of evaluation w until reference time t , after which point the worlds ‘branch.’ The ordering source ranks as ‘best’ worlds that continue as expected.

The example in (28) illustrates with a Navajo example seen above. Here, the future-marked verb indicates that in all of the most ‘normal’ worlds w' that are identical to the world of evaluation w up to reference time t (here, speech time), the proposition *that I give birth* is true at subsequent time t' in those worlds w' .

- (28) (Naaki yiskáago) 'adíłchííł.
 two day 1 SBJ.give.birth.FUT
 ‘I will give birth (in two days).’ (context (6a))

The priority modal interpretation of future-marked verbs arises when the modal base and ordering source receive different values in context. In accord with analyses of English priority modals by Portner (2009) and Rubinstein (2012), I take the priority interpretation of future-marked verbs to arise from a circumstantial (factual) modal base and an ordering source that takes into account priorities salient in the context.

The example in (29) illustrates for a Navajo sentence discussed above. The future-marked verb indicates that in all worlds w' in which priorities held at reference time t are satisfied, the proposition *that she washes the baby* is true at subsequent time t' in those worlds w' . The past particle *ńt'ée* indicates that the reference time t precedes speech time.

- (29) T'áá 'íídáá' 'awée' táázhhdoogis ńt'ée.
 just then baby 4OBJ.3SBJ.wash.FUT PAST
 ‘She should have washed the baby already.’ (Willie 1996 (44))

6. Conclusions and the crosslinguistic context

In this paper, I have argued that Navajo future marking includes both a fixed temporal component and a flexible modal component. The flexibility of the modal component allows Navajo sentences with future-marked verbs to either express predictions or priorities.

The proposal for Navajo can be contrasted with other languages. Interestingly, the proposed ambiguity distinguishes the Navajo future marker future marking in Tlingit, a related Na-Dene language. Cable (to appear) demonstrates that Tlingit speakers sometimes use future-marked verbs in sentences that appear to function as statements of deontic necessity.⁷ However, Cable argues that Tlingit future-marked verbs do not express deontic necessity as part of their basic truth-conditional meaning: even in contexts that bias a deontic interpretation, future-marked verbs are only reliably accepted if the subject of the verb is predicted to meet the obligations placed on him or her. We expect Tlingit speakers to reject future-marked verbs in conjoined *should but won't* contexts like (25) and (26).

The analysis that I give for Navajo brings it closer to analyses for other languages, where future markers are claimed to have true modal flexibility. There is variation, however, in the precise modal meanings available for future markers in individual languages. In

⁷Deal (2011) makes a similar observation for Nez Perce verbs bearing the prospective affix *u'*.

contrast with Navajo, for instance, a priority interpretation appears to be missing for future markers in St'át'imcets and Paraguayan Guaraní (Matthewson 2006, Tonhauser 2011). Are there restrictions on the kinds of modal meanings that future markers can express? Or, does the presence of one modal interpretation for a language's future marker imply the existence of other modal interpretations? Answers to these questions will only be possible through continued crosslinguistic comparison and fieldwork on typologically diverse languages.

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