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TIME IN NAVAJO: DIRECT AND INDIRECT INTERPRETATION¹

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This article discusses the temporal interpretation of Navajo sentences. Navajo has linguistic forms that give temporal information: future tense, past and future particles, and temporal adverbials. These forms are optional, so that many sentences contain no direct temporal information. In such cases, aspectual information gives pragmatic cues to the temporal location of the situation expressed. The key factor is boundedness: in the default case, unbounded situations are taken as present and bounded situations as past. Three pragmatic principles explain the inference from aspect to temporal location. The principles, which also hold for certain other languages, apply to verb words with overt aspectual viewpoints as well as to zero-marked verb words.

[KEYWORDS: Navajo, tense, aspect, semantics, pragmatics]

1. Introduction. This article proposes an explanation of the way information about time is conveyed in Navajo. We assume that all sentences have a temporal interpretation, direct or indirect. We have two main purposes in this article. The first is to discuss temporal interpretation in this Athabaskan language. The Navajo temporal system, which is varied, has not yet been described in detail. Further, the language allows sentences without explicit temporal information. In such sentences, temporal interpretation is indirect—arrived at by inference. We outline the principles underlying the default inferences. Our second purpose is to show that a few general principles of temporal interpretation, which hold for some other languages, apply very nicely to Navajo. The principles include semantic rules for interpreting explicit expressions about time and pragmatic principles for inferring temporal location indirectly. The applicability of these principles to Navajo is a satisfying though unsurprising result; but it is worth working out explicitly.

The temporal system of Navajo offers a future verb inflection, temporal particles, and temporal adverbs. Although a well-formed sentence need not

¹ We would like to thank the participants and audience at the conference on Cross-linguistic Data and Theories of Meaning, Max Planck Institute of Psycholinguistics, Nijmegen, Holland, 2003, for their questions and comments; we also thank the reviewers of this article. The examples in this article were contributed by E. Perkins, Lorene Legah, and Irene Silentman, unless otherwise noted. Some of this material is discussed in Smith et al. (2003). This material is based in part on work supported by the National Science Foundation under grant no. 0317318.

have any of these forms, speakers consistently agree on temporal interpretation. To account for these facts, we must consider sentences with and without direct temporal information. In this article, we propose semantic and pragmatic principles that account for both types of cases. The temporal interpretation of all sentences is deictically based. For sentences without direct temporal forms, aspectual information allows the inference of temporal location. We propose three general pragmatic principles to account for this, which we call temporal interpretation: the Deictic Principle, the Bounded Event Constraint, and a Simplicity Principle. The key factor in temporal inference is boundedness, direct or inferred. To arrive at the inference of boundedness we use the Temporal Schema Principle, a special case of the simplicity principle. We deal here with nonnarrative discourse only.

Section 2 gives a brief introduction to our approach to aspect and time; 3 presents the basic facts about Navajo and then describes and discusses sentences with direct temporal forms, relating them to sentences with tense and/or temporal locating adverbials in other languages; 4 discusses aspect in Navajo and offers an inferential account of sentences without direct temporal forms, based on aspectual information; we also discuss some nondefault cases; 5 concludes.

2. Aspect and temporal location.

2.1. Aspectual systems. We assume that aspectual systems in language have two components, “situation type” and “viewpoint” (Smith 1997). The term situation type refers to the event or state expressed by a clause, following Vendler (1957), Dowty (1979), and others. Situation types are idealizations of classes of situations; they differ according to the temporal features of dynamism, telicity, and duration. There are five classes: states, and events that vary telicity and duration.² Each class has an associated temporal schema with its defining temporal properties. The situation type of a clause is built up compositionally from the verb or verb base, its arguments, and relevant other forms. There are basic and derived situation types. Derived situation types involve a shift from the basic meaning of a clause, often due to an adverb (or, in Navajo, one of a few mode morphemes). For instance, generalizing clauses with a frequency adverb indicate a pattern of situations rather than a particular situation. An event clause with such an adverb is stative: *He walked to school* expresses an event; but *He often walked to school* expresses a (derived) state. In Navajo, situation type is expressed by the verb word or clause (see 4 below). Clauses of different situation type have unique

²The event classes are these: Activities (dynamic, atelic, durative), Accomplishments (dynamic, telic, durative), Achievements (dynamic, telic, punctual), and Semelfactives (dynamic, atelic, punctual); see Vendler (1957) and Smith (1997). This list differs from Vendler’s only in that he considers Semelfactive as a subtype of Achievements.

distributional and interpretive properties; they are covert grammatical categories in the sense of Whorf (1956).³

Aspectual viewpoints make information about a situation visible to semantic interpretation. On the analogy of a camera lens, they focus all or part of a situation. Perfective viewpoints typically focus events with endpoints.⁴ Imperfective viewpoints, which include the progressive, focus events and states with no information about endpoints.⁵ The neutral viewpoint is flexible: it gives partial information about a situation, allowing bounded or unbounded interpretations. The neutral viewpoint makes visible part of a situation that may but need not include its endpoints. Perfective and imperfective viewpoints are usually expressed overtly by morphemes; the neutral viewpoint appears in clauses that do not have an overt viewpoint morpheme with semantic content. There can be sentences with no viewpoint morpheme, or a morpheme that does not have its usual semantic value may appear (see the discussion of Navajo statives below). In Navajo, aspectual viewpoint is expressed by certain mode morphemes (see 3 below). Languages differ in the interaction of viewpoint and situation type: not all viewpoints need be available for all situation types (Smith 1997).

2.2. Temporal location. Sentences introduce situations—the term includes events and states—into the common ground of a discourse. To assess the truth of a sentence and to fully grasp meaning, one needs to know when the situation in question is located temporally, in addition to other factors. Temporal location is transparent when linguistic forms give information about time directly. In other cases, one must assign a temporal interpretation on the basis of inference. In this section, we discuss direct, explicit temporal meaning.

We assume that temporal interpretation in language is deictic, like all linguistic communication. The speaker is the canonical center and Speech Time is the default orientation point. Speech Time is the present, and other times are oriented to it: the past precedes Speech Time, the future follows.

Temporal meaning was explored by Reichenbach (1947) in his important study of tense. He showed that tense involves three times: the time of speech, the time at which an event takes place, and Reference Time, the time

³ In some sentences, basic or derived situation type is expressed by overt morpheme(s), but this is not consistently the case.

⁴ Languages differ in whether the perfective viewpoint is available for states and, if so, how it applies to them (Smith 1997).

⁵ The Progressive is a type of imperfective that appears in many languages. Progressives apply only to eventive verbs and focus an ongoing situation, often with a sense of motion. Like imperfectives generally, they do not include endpoints (Smith 1997). For additional comments on the progressive in Navajo, see 4.1 below; Midgette (1987) discusses the Progressive in Navajo in detail.

talked about in a sentence.⁶ In this study, we adopt recent approaches to tense based on Reichenbach's ideas (Smith 1997, Kamp and Reyle 1993, and Klein 1994, especially). Tense codes two relations between these times: the relation between Speech Time (SpT) and Reference Time (RT), and the relation between Reference Time and Situation Time (SitT). This approach is known as the two-dimensional theory of tense (Kamp and Reyle 1993). Reichenbach considered tense only: we extend the analysis to temporal meaning more generally later in this article. The simple present tense normally conveys that all three times are the same. The past tense conveys that RT precedes SpT. Future tense conveys that RT follows SpT. The future is symmetrical with the past tense in its relation to SpT; it also has an element of modality. As Lyons (1997:677) puts it, "Futurity is never a purely temporal concept; it necessarily includes an element of prediction or some related notion."⁷ The so-called relative tenses differ from simple tenses in that RT differs from SitT. An English example of this is the perfect, indicated by the auxiliary *have*.

Tense meanings, we assume, appear in the lexicon of a given language, associated with a given tense. They are integrated with the other information in a clause or sentence.

In the conventional definition, tense is a grammatical morpheme that expresses location in time (Comrie 1986). We use a slightly narrower definition. We take tense as an inflectional category that plays a role in the grammatical structure of a sentence.⁸ The inflectional morphemes of tense form the "spine" of the sentence: tense is involved in subject agreement, case assignment, and the distinction between finite and nonfinite clauses. As part of the sentence spine, tense is an obligatory morpheme. This is important because it has as a consequence that, in fully tensed languages, all finite clauses give direct information about temporal location.⁹ As we show in a later section, there is a Navajo future inflectional morpheme but it does not fit the characterization of tense given here.

⁶ The arguments for Reference Time include the meaning of the perfect, the relation between situations, and shifted deixis (Smith 1997).

⁷ The differences between tenses across languages are beyond the scope of this discussion. The status of the future as a tense has been controversial. Not all agree that the future can be conveyed by tense. For instance, Bybee et al. (1985:157) claims that "the future does not belong in the same grammatical category as the past." In our view, future may be conveyed by tense, depending on the language. Enç (1996) shows that *will* patterns semantically with modals in sequence of tense contexts. In French, the *futur* tense patterns with the other tenses (Smith 2004). The semantics of the future is discussed in Kamp and Rohrer (1983).

⁸ Rather than attempting to state defining features of tense, Dahl and Velupillai (2005) recognize a general functional category that includes tense, aspect, and mood, in a comprehensive cross-linguistic study.

⁹ We do not consider small clauses or participial clauses here.

It follows from this definition that not all languages have tense. We are aware of syntactic treatments in which tense is an abstract feature that need not be realized as an inflectional morpheme; we do not pursue this possibility here (see, for instance, Adger 2003). For languages that do not have tense, temporal information is conveyed by other linguistic forms, e.g., independent morphemes such as temporal particles and adverbs. Moreover, tense is not an all-or-nothing category. Languages may have some tense features without being fully tensed. We shall see that this is the case for Navajo.

Temporal locating adverbs appear optionally in all languages, as far as we know. We assume that their meanings involve the same three times as simple tenses. Adverbs may relate a situation to SpT (*before, yesterday*), or to a past or future RT (*after, then, before, three days earlier, later*), or to SitT (*They said they were leaving in three days*). When they appear with tense, in the basic cases adverbs specify the temporal location indicated by tense. When they appear without tense, they provide direct temporal information. We assume that the meanings of temporal locating adverbs are coded in the lexicon (we do not discuss other types of temporal adverbs here). The meanings will give a relational value to Speech Time or Reference Time, whichever is relevant, and in some cases, more specific information: thus the entry for *yesterday* would specify the meaning (SpT, relational value 'before', one day). The important point here is that temporal locating adverbs provide enough information to locate a situation temporally for purposes of evaluating the truth of an utterance.

Both tense and locating adverbs, then, follow the Deictic Principle, stated in (1):¹⁰

(1) Deictic Principle: Situations are located with respect to Speech Time.

We draw on this principle in the discussion of sentences with and without direct temporal information.

In this paper, we consider only those features of the Navajo language that pertain directly to temporal and aspectual interpretation, in the sense sketched here. Thus we do not deal with the morphology of the categories, a difficult and fascinating area that is beyond the scope of this discussion.¹¹

2.3. Interaction of aspect and temporal location. The Deictic Principle is constrained by a second well-known principle of communication: only situations that are unbounded can be located at Speech Time. Following

¹⁰ This is the basic, default case; situations may be related to a different orientation time, or to each other.

¹¹ We essentially follow Young and Morgan (1987) and Young, Morgan, and Midgette (1992) in identifying mode morphemes. We do not discuss the close morphological relations between certain categories nor their alternations; but see Kari (1979), Hardy (1979), and Faltz (1998).

Kamp and Reyle (1993), we note that speakers follow the tacit convention that communication is instantaneous. This perspective is incompatible with the report of a bounded event, because the bounds would go beyond the moment. In English, for instance, present tense event sentences with the perfective viewpoint are not taken as expressing a specific event but as generalizing sentences, a type of derived state: they do not express a single event (*John feeds the cat*). There are some well-known exceptions, real and apparent, not discussed here.¹² We call the requirement the Bounded Event Constraint (Smith 2003):

- (2) Bounded Event Constraint: Bounded events are not located in the Present.

Other scholars have noted essentially the same constraint, e.g., Lyons (1977) and Giorgi and Pianesi (1997). This constraint is honored in different ways across languages; we discuss its effect in Navajo in 3.4 below.

These two principles are supplemented by a third, the Simplicity Principle of Interpretation, and its corollary, the Temporal Schema Principle. See the discussion of zero-marked sentences without direct temporal information in 4 below.

3. Navajo. We begin with some introductory facts about Navajo and then turn to Navajo sentences with explicit temporal information.

3.1. Basic facts about Navajo. Navajo has no direct counterpart to the simple surface verbs of languages like English. The “verb word” of Navajo is a complex of morphemes that consists of verb stem, a so-called classifier, which either is determined by the stem or marks a shift in valence, and prefixes of different types (Young and Morgan 1987). The verb stem and classifier usually form the theme or basic lexical entry; the theme and one or more adverbial derivational prefixes form the “verb base.”¹³ In addition, pronominal prefixes (subject and object) and a conjugational “mode” prefix appear in the verb word. Nominal arguments are optional: a well-formed Navajo clause may consist only of a verb word. (3) and (4) illustrate.¹⁴

¹² The exceptions include sports-announcer reports, stage directions, commentary, and performatives (Smith 2003).

¹³ Sometimes the classifier is not thematic, and often other nonclassifier prefixes are thematic.

¹⁴ All Navajo examples in this paper are written in the conventional orthography. We gloss the Navajo examples as follows: prefixes are noted with their basic meanings, including thematic; prefixes with no clear meaning are marked pref. 1, 2, and 3 with a noun, postposition, or verb indicates first, second, and third person respectively. With verbs, we note whether a prefix is subj = subject, obj = object, or io = indirect object; cl indicates classifier; the final morpheme in a clause is usually the verb stem. In glossing the verb word, pronoun prefixes are

- (3) The structure of the verb word complex:
 Verb theme: [classifier [verb stem]]
 Verb base: [verb prefixes [theme]]
 Verb word: [pronominal and mode prefixes [base]]
- (4) *na'ashkóq'*
na-'a-∅-sh-l-kóq'
- around + unspecified.obj + impf + 1 subj + cl + swim
 'I swim around'
- Verb base: [*na* . . . [*hkóq'*]] 'swim around'
 Verb theme: [*l*[*kóq'*]]

The derivational prefix *na-* adds meaning to the verb theme. All prefixes have fixed positions relative to each other; the positions are conventionally represented by a template.¹⁵

Navajo verbs occur with up to seven inflectional forms in position VII of the template; they are called *MODES* in the Navajo literature. The term is used differently in most of the literature on tense, aspect, and mode. In this paper, we use *MODE* in the tradition of the Navajo literature. One of these modes occurs in each verb word. In (3) above, the third prefix is the mode morpheme. The mode is realized in three different ways: by the form of the stem alone, by a prefix alone, or by the form of the stem and a prefix combined. Mode morphemes combine morphologically with subject prefixes (Young and Morgan 1987 and Faltz 1998). We assume that the modes are associated with the highest maximal projection in a clause: the Navajo version of InFLP. The projection provides a landing site for head movement of the verb; Hale (2000) takes a similar (though not identical) approach.¹⁶

glossed according to person and function (1subj, 2obj, etc.); plural is noted as pl, singular is unmarked; Modes are noted as impf (imperfective), perf (perfective), prog (progressive), cust (customary), iter (iterative), fut (future). The neutral viewpoint is noted as neut. Some derivational prefixes that do not have a clearly distinguishable meaning are called thematic prefixes in Young and Morgan (1987); we note them as pref. Other glosses are cess (cessative), cmlp (completive), iter (iterative), start (inceptive). Prefixes with no phonological shape are noted as ∅. In the verb base, prefixes are noted according to meaning and classifier (cl). Past and Future particles are noted as PPrt and FPrt respectively. Possessives are noted as person (1-mother = 'my mother').

¹⁵ The morphological details of the verb word are not considered here; for discussion, see Young and Morgan (1987), Young, Morgan, and Midgette (1992), and Faltz (1998).

¹⁶ In Hale's (2000) treatment, the Mode projection is high in the tree but not the top functional projection. This approach is not essentially different, we think, from other configurational approaches to Navajo that posit AgrS and AgrO as functional projections, e.g., Speas (1990) and Rice and Saxon (2005).

The traditional names indicate the meanings of the modes:

- (5) Mode (inflectional) prefixes in Navajo: Future, Perfective, Imperfective, Progressive, Customary, Iterative, Optative

The Future Mode is mainly a temporal location indicator, although it can also have a strong modal meaning; we discuss it directly. Three modes express aspectual viewpoints: the Perfective, Imperfective, and Progressive. The Progressive is a type of imperfective; it is available only for motion verb bases in Navajo. The Customary (called the Usitative in Young and Morgan 1987) expresses a generalization, a pattern of events; verb words with this prefix are derived atelic events, that is, events with repeated subevents and no natural final endpoint.¹⁷ The Optative expresses desires and wishes. The modes vary in semantic value although they occupy the same position in the verb word. They do not correspond to a coherent semantic category (although time, modality, and aspectual information are closely related: see Steele and Akmajian 1981 and Dahl and Velupillai 2005).

Every verb must have a mode morpheme. Event verb bases may have any one of the seven modes, assuming plausibility.¹⁸ The stem shape of an event verb base varies according to the mode prefix with which it appears. Event verb bases may have different stem shapes when they appear with different modes.

The case of state verbs is different, as is well known. These verbs are called “neuter” in Young and Morgan (1987) and “static” in Reichard (1951). While there is a choice of mode for other verbs (and the choice has semantic consequences), each state verb can appear with one fixed mode morpheme: perfective or imperfective. Further, the stem shapes of state verb bases do not alternate. The perfective and imperfective morphemes do not have their usual viewpoint meaning when they appear with state verbs. Thus state verb words have a mode morpheme morphologically—a “formal” mode morpheme—but not one that is semantically active.¹⁹ In our terms, states semantically have

¹⁷ The Customary and Iterative modes are often interchangeable, according to Young and Morgan (1987); we consider them as separate in this discussion. Examples appear in 4 below.

¹⁸ There are some constraints on the co-occurrence of Modes with different classes of verb base; see Young and Morgan (1987:144–89).

¹⁹ There are some regularities: neuter imperfectives tend to appear with adjectival states that describe size, shape, weight, color, distance, taste, appearance, existence, and other physical attributes. Neuter perfectives tend to appear with states of position and extension (Young and Morgan 1987:141, 189 et seq.). The same situation obtains for state verb bases in other Athabaskan languages. For Ahtna, Kari (1979:109) refers to state verb bases as “neuter in aspect” although they have viewpoint morphemes. For Koyukon, Axelrod (1993:50) quotes Krauss and Leer (1981), who refer to “neuter imperfectives” and “neuter perfective” in discussing states or neuter verb bases.

the neutral viewpoint. States may be taken as bounded or unbounded; there is a default interpretation, which may be overridden by information in the context. The neutral viewpoint is therefore more flexible than the overt viewpoint (Smith 1997).

Verb words thus appear with the neutral viewpoint in two cases. Event verb words that appear with non-viewpoint modes (Future, Customary, Iterative, Optative) have no overt viewpoint morpheme because the verb has space for only one mode. Such verb words have the neutral viewpoint. State verb words also have the neutral viewpoint. We shall refer to both cases as “zero-marked” for aspectual viewpoint, following Klein et al. (2000). We discuss the interpretation of the neutral viewpoint in 4.3.1.

3.2. Direct temporal location. In this section, we discuss Navajo sentences that give direct information about the temporal location of a situation. There are direct temporal forms of three types: the Future mode; past and future particles; past, present, and future adverbs.²⁰ We consider them in turn.

3.2.1. The Future Mode. Verb words with this mode express events that are located in the future, at a time following Speech Time. The Future Mode has the element of modality that accompanies all reference to the future; the discussion here focuses on meanings that are primarily temporal. Reference time (RT) is the same as Situation Time (SitT) unless additional information suggests otherwise.²¹ This mode also has a “cluster of other meanings associated with the future: prediction, potentiality, desire, [some] imperatives” (Midgette 1995:57).²² We shall not discuss these other meanings; most sentences that have them contain additional morphological material as well, as the quotation from Midgette indicates.

Recall that the Future Mode is available for event but not state verb words. The examples illustrate; the *d-* in the verb words below is a part of the Future Mode morpheme and is glossed ‘fut’ (but note that *d-* does not always designate this):

- (6a) *Deeshchah*
 1subj-fut-cry
 ‘I will cry’ (cf. *Yishcha* ‘I am crying’)

²⁰ Another way to convey temporal location is with a main verb that refers to the passing of time, e.g., *í'í'á* ‘the day passed’; the situation is expressed in a subordinate clause (Smith 1997:429).

²¹ In (31c) below, for instance, SitT precedes RT.

²² Navajo does not have a special form for the imperative. Imperatives are expressed by second-person Imperfectives or second-person Futures, negative imperatives by second-person Optatives (Young and Morgan 1987:204).

- (6b) *Shimá ch'iyáán la' bá nahideeshnih*
 1-mother groceries some 3-for pref-1subj-fut-buy

'I'll buy some groceries for my mother'

- (6c) *Mary yiskáago bit hodoozhqot*
 Mary tomorrow 3-with areal.3subj-fut-happy

'Mary will be (become) happy tomorrow'

[Context: Mary's boyfriend is coming to visit her]

3.2.2. Particles and enclitics. Navajo has temporal particles for future and past; they are free morphemes, independent of the verb word.²³ Particles are usually placed to the right of the verb word and appear with event and state verb words of all types. The future particle is *dooleet* or the short form *doo*. The future particle does not usually appear with the Future Mode. However, some speakers accept certain sentences with both future morphemes.²⁴ There are two main past morphemes: the particle *nit'éé'* and the enclitic *-dáá'*; the latter marks subordinate clauses (other enclitics do not directly convey pastness). The examples illustrate both future and past particles, marked FPrt and PPrt respectively; enclitics are marked PEnc; state verb words are marked neut:

- (7) Future particle

- (7a) *'Asháq dooleet*
 1subj-impf-eat FPrt

'I will be eating' (cf. *'ashá* 'I'm eating')

- (7b) *Mary yiskáago bit hózhqo doo*
 Mary tomorrow 3-to areal-3subj-be-happy(neut) FPrt

'Mary will be happy tomorrow'

[Context: Mary's boyfriend is coming to visit her]

- (8) Past particle and enclitic

- (8a) *'Asháq nit'éé'*
 1subj-impf-eat PPrt

'I was eating' (cf. *'ashá* 'I'm eating')

²³ There are a number of other such particles in Navajo; they are used frequently. See Young and Morgan (2000) for a careful discussion.

²⁴ For instance, *ndeeshnish dooleet* 'I am going to be working'; *ndoolnish dooleet* 'make sure that he works, e.g., when he arrives'. Not all speakers accept such sentences.

(8b) *Siláo nishítíí ní'éé'*
 policeman 1subj-be(neut) PPrt

'I was a policeman'

(8c) *Kingóó 'aneeshkał ní'éé' shee*
 store-toward 1subj-prog-herd along PPrt 1-on

nikihonítá
 3psbj-begin-perf-rain

'As I was herding (sheep) toward the store, it began to rain on me'

(8d) *'Ashkii nishítínéédáá' dóola shít*
 boy 1subj-be(neut)+PEnc+PEnc bull 1-with

naalgeed ní'éé'
 about-3subj-impf-buckride PPrt

'When I was a boy, I used to buckride a bull'

The past particle in (8c) indicates a connection to the context, as do the past enclitics in (8d). They often appear with a following clause, as in these examples. The continuation may be adversative, as in (8c), but need not be, as in (8d).²⁵ With nouns, the particle *ní'éé'* means 'former' or 'deceased'.

The temporal meanings of the particles are like those of the past and future tenses: they locate a situation in the past or future. In terms of the three times introduced in 2, the particles locate a situation at a Reference Time before or after Speech Time, and simultaneous with Situation Time. Adverbials like *t'áá 'íídáá'* 'already' and other information can indicate that Situation Time differs from Reference Time, as the following example shows; *io* marks indirect object:

(9) *Ch'il tígaii bi'níitchozh ní'ée' na'ats'óósí t'áá 'íídáá'*
 cabbage 3obj-1subj-imp-eat PPrt mouse already

iyíígháázh lá
 3io-3subj-perf-nibble discover

'I was going to eat the cabbage but I found that a mouse had already nibbled on it' (Young and Morgan [henceforth YM] 1987:218)

Also, like tense, the Future Mode and the temporal particles have atemporal meanings in conditional and counterfactual contexts. In such contexts,

²⁵ Adversative contexts suggest but do not require a negative meaning (Smith 1997). Adversative contexts imply opposition to an expectation of some kind and have a contrastive, negative flavor. *Adversative* means "opposition, contrariety, or antithesis" (see the *Oxford English Dictionary*); the term is used in traditional grammar to characterize conjunctions such as *but*, *or*.

they combine to convey the meaning of irrealis or non-actuality. It is quite common for non-present tenses to have such meanings (as shown in cross-linguistic studies, e.g., Steele 1975, Fleischman 1989, and Iatridou 2000).

In Navajo conditionals, the past particles have a non-actual meaning; the combination of past and future conveys hypothetical or contrary-to-fact meaning (Elgin 1973, Hardy 1979, Young and Morgan 1987, Willie 1996, and Krause 2001). The conditional is illustrated in (10):

- (10) *Béeso nee'ásdijídǫ́ǫ́' ta'*
 money 2subj-for-indef-perf-dwindle+PEnc some
na'deeshnit
 2io-1subj-fut-give
 'If you run out of money, I'll lend you some' (YM 1987:307)

The past enclitic *-dǫ́ǫ́'* appears in the first clause, conveying a hypothetical meaning in this context; the second clause has the Future Mode.

Conditionals that implicate counterfactuality are expressed in Navajo with a combination of forms that convey past and future in their temporal uses.²⁶ The first examples are single-clause past counterfactual sentences. Here and in other counterfactual cases, the combination of past particle and Future Mode or particle has non-actual meaning. The sentences implicate that the event described did not take place:

- (11a) *Tl'íztí náhiideesh'naat ní'éé'*
 goat 1subj-again-fut-revive PPrt
 'I should have revived the goat' (Willie 1996)
- (11b) *Baa ní'ǫ́ǫ́ doo ní'éé'*
 3-to 1subj-perf-handle FPrt PPrt
 'I should have given it to him' (Hardy 1979)
- (11c) *Ch'iyáán 'áshléeh doo ní'éé'*
 meal 1subj-impf-cook FPrt PPrt
 'I should have been cooking'

The examples show that both the Future Mode and future particles can appear in counterfactuals; and that verb words may have the perfective or

²⁶ Conditionals like the ones in (12) implicate but do not assert counterfactuality, as is well known (Anderson 1951 and Iatridou 2000). We use the locution "conditionals that implicate counterfactuality" rather than the more common "counterfactual" to emphasize this point. We thank Bernard Schwarz for bringing Anderson (1951) to our attention.

imperfective viewpoint with appropriate differences in interpretation. (The progressive and neutral viewpoints also appear in counterfactuals.)

Past conditionals that implicate counterfactuality are illustrated in (12). The first clause has *-go*, a subordinator; the main clause has the past particle and a future form, either the particle FPrt or the Future Mode morpheme:

- (12a) *Shiye' 'azee' bąqah 'ályaago*
 1-son medicine 3-on 3subj-impf-make+GO
ch'í'dooddijł́ nt'éé'²⁷
 3subj-fut-survive PPrt

'If my son had been treated with medicine, he would have survived' (Krause 2001)

- (12b) *Siláo 'idlíjí hazhó'ó bíhool'ąą'go*
 policeman indef-e-way carefully 1subj-perf-learn+GO
shíí t'ahdii siláo nishł́í dooleet nt'éé'
 probably still policeman 1subj-be(neut) FPrt PPrt

'If I had taken police training more carefully, I'd probably still be a policeman' (YM 1987:678)

- (12c) *Siláo bighandi nýáádąą'go ch'iyáán*
 policeman 3-house 3subj-perf-PEnc1+GO meal
'ílééh doo nt'éé'
 3subj-impf-cook FPrt PPrt

'If the policeman came/had come to her house, then she would have been cooking'

Perfective or imperfective viewpoints can appear in either clause, according to the meaning conveyed. In this, Navajo counterfactuals are unlike some in other languages, where viewpoint morphemes are limited and do not convey their viewpoint meaning (Iatridou 2000).

The atemporal past meaning of the examples above may be hypothetical rather than contrary-to-fact. This interpretation is pragmatically natural when the speaker does not know whether an event has occurred or not. For instance, assume that you are a doctor in the hospital where Mary is one of your patients. She exhibits disturbing symptoms, and you wonder whether the nurse has given her the medicine she needed during the night. You might say this:

²⁷ We have modified the Navajo in this sentence slightly for grammaticality (EP).

- (13) 'Azee'neikáhí 'azee' neiznii'go
 medicine-giver medicine around-3obj-perf-3subj-passout-GO
 naaltsoos yikáá' 'áyiilaa doo ít'éé'
 paper on-it 3subj-perf-make FPrt PPrt

'If the nurse had dispensed the medicine, she would have made a note of it' (so, look at the notebook to see if Mary got her medicine)

Other natural scenarios for hypothetical interpretation are criminal investigations and reconstructions of historical events. The counterfactual interpretation is often preferred in practice because people usually know whether a past event they are talking about has taken place (see Anderson 1951).²⁸

Conditionals that implicate counterfactuality set in the present contain past and future temporal elements. The adverb *k'ad* 'now' is added to this sentence to ensure the present interpretation; the example is modeled on one in Iatridou (2000):

- (14) 'Ánísts'óózídáq'go k'ad 'ashyéeh doo
 1subj-thin(neut)-PEnc+GO now 1subj-be-married(neut) FPrt
 ít'éé'
 PPrt

'If I were thin, I would be married now'²⁹

Non-actual meanings are often associated with the past tense. Navajo may be unusual in combining forms for past and future to express these meanings.

To what extent does the Future Mode differ from the future particle? We asked whether Navajo speakers treat the two forms differently, looking at sentences with negation and at degree of remoteness or planning. We found no contrasts in grammaticality or interpretation between sentences with the Future Mode and those with the future particle. However, the mode and particle have different distributions. The Future Mode is available only for event verb words, while the particle is available for all verb words. The particle appears with aspectual viewpoint morphemes, the Future Mode does not. Verb words with the Future Mode and/or future particles are interpreted in the same manner, as is future tense in a fully tensed language. They are temporally located at a Reference Time that follows Speech Time, and is equal to Situation Time.

²⁸ Anderson (1951) gives this telling example: "If Jones had taken arsenic, he would have shown just exactly those symptoms which he does in fact show." Karttunen and Peters (1979) also discuss the context-dependent nature of counterfactual interpretation.

²⁹ This also can mean 'If I had been thin, I would be married now'.

3.2.3. Adverbs. The third type of direct temporal form is the adverb. Navajo has future, past, and present adverbs. They appear quite freely with event and state verb words, and with the Future Mode, temporal particles and enclitics, and different aspectual viewpoints. The question of just when they are used is beyond the scope of this article. Unlike the temporal particles and enclitics, adverbs do not have atemporal meanings in conditional contexts.

Future adverbs appear freely with different verb words, so long as the situation can be scheduled or planned:

- (15a) *Nínáádeezidgo Na'nízhoozhígóó deeyá*
 next-month Gallup-to 3subj-perf-go

'He's going to Gallup next month'

- (15b) *Yiskáago 'azee' yit shaa*
 tomorrow medicine 3-with 1-to

'anáá'átsééh

out-of-sight-again-3subj-impf-jab

'He is giving me another injection tomorrow' (YM 1987:363)

- (15c) **Mary yiskáago bit hozhó*
 Mary tomorrow 3-with be-happy(neut)

[Context: Mary's boyfriend is coming to visit her]

(15c) is unacceptable. The requirement of scheduling is similar to that for futurates in English: *The ship arrives tomorrow* is fine, but **Mary is happy tomorrow* is not.

Past adverbs, e.g., *'adááddáá'* 'yesterday' and the enclitic *-dáá'* 'last, prior', appear with all verb words and viewpoints. The examples in (16) have event verb words with the imperfective and perfective viewpoints; the verb word in (16b) has the "completive" morpheme, glossed *cmpl*:

- (16a) *'Adááddáá' Jáan Tségháhoodzánídi naagháá nt'éé'*
 yesterday John Window Rock-to 3subj-impf-go

'John was in Window Rock yesterday'

- (16b) *Shííddáá' diyogí ninít't'ó*
 summer-PEnc rug cmpl-1subj-perf-weave

'Last summer I finished weaving the rug'

The present adverb *k'ad* 'now' appears with event and state verb words generally. However, if a verb word has the perfective viewpoint, the sentence is either ungrammatical or interpreted as referring to an event in the

recent past, rather than in the present. The natural translation for such sentences is the present perfect, as in (17):

- (17) *Shichidí yíchxq' ní't'éé' k'ad*
 1-car 3subj-perf-ruin PPrt now
'ánáshdlaa
 thus-back-3obj-1subj-perf-make

'My car was ruined but now I have repaired it'

This is just what we would expect, given the Bounded Event Constraint. The perfective expresses bounded events, which cannot be located in the present according to the constraint.

We take it that Navajo clauses with temporal adverbs are interpreted in the same manner as such clauses in languages like Mandarin Chinese. Mandarin is tenseless and allows optional temporal adverbs. Clauses with temporal locating adverbials are temporally located according to the value of the adverbial. As noted above, adverbials of this type specify a relational value to Speech Time or Reference Time, and a particular time where appropriate. Locating adverbs explicitly locate a situation in time.

To summarize, for event verb words, future time may be expressed directly by the Future Mode. For both event and state (neuter) verb words, particles and/or adverbs express future time; past particles, enclitic, and/or adverbs express past time; adverbs express present time. Due to the Bounded Event Constraint, sentences with present adverbs and the perfective viewpoint are taken as about events in the recent past.

3.3. Navajo temporal forms and tense. The Future Mode of Navajo is very much like a tense. The future is an inflectional form. Recall that in Navajo every event verb word has a mode morpheme; the future is a mode, the only one with a directly temporal meaning. The Future Mode is like a future tense in meaning, and it contributes to atemporal meanings in conditional contexts, as tenses often do. But in some ways the Future Mode is not like a tense. Semantically, its presence means future, while its absence means no information about the future.³⁰ Distributionally, the Future Mode contrasts with other morphemes that do not convey temporal location. And it is available only for event verb words.³¹ Thus temporal information is not obligatory in either event or state verb words of Navajo and we conclude that Navajo is not a fully tensed language.

³⁰ This is a "subordinative" contrast in markedness theory: a positive property contrasts with no information about that property. See Jakobson (1932) and Smith (1997:15).

³¹ Further, the future mode cannot be considered part of the "spine" of a sentence since it does not participate in subject-verb agreement, case assignment, or the finite-nonfinite distinction.

The Navajo particles and enclitics for past and future are not tenses.³² They are independent, optional morphemes. Yet they are integral to the temporal system: they contribute to atemporal meaning in conditional contexts. Temporal adverbs, in contrast, are optional and do not interact with other temporal forms.

4. Temporal inference and aspectual information. We now turn to Navajo sentences that have no direct information about time: not the Future Mode, no temporal particle, and no temporal locating adverb. For such sentences, aspectual information allows the inference of temporal interpretation. The aspectual viewpoints of Navajo are sometimes called past and present tenses respectively (Hardy 1979 and Young and Morgan 1987). We show below that this is not correct. Rather, the viewpoints convey aspectual information that has temporal implications. We discuss clauses with overt aspectual viewpoints first and then zero-marked clauses with the neutral viewpoint.

4.1. Aspectual information in Navajo. The overt aspectual viewpoints of Navajo are the Perfective, the Imperfective, and the Progressive. The Perfective makes events visible for semantic interpretation with endpoints (atelic, durative events have arbitrary final endpoints). The Imperfective and Progressive make events visible for semantic interpretation without endpoints. There are several interesting differences between these two. The Imperfective is available quite generally for events; it may focus an internal interval of a situation, or a preliminary interval, before the situation actually occurs. In contrast, the Progressive in Navajo is available only for a class of verbs known as motion verbs³³ and focuses internal intervals only. These examples illustrate (Midgette 1995:61):

(18a) 'Awéé' tsásk'eh yikáá'dóó 'adah 'iigeeh
 baby bed 3-off down 3subj-impf-(about to).fall
 'The baby is about to fall off the bed'

(18b) 'Awéé' tsásk'eh yikáá'dóó 'adah yigoh
 baby bed 3-off down 3subj-prog-fall
 'The baby is falling off the bed'

³² For a different view, in which temporal particles are associated with abstract tense, see Speas (1990).

³³ The Progressive applies only to those verbs that have a "Cursive" stem shape. The class, which is quite large, includes verbs of literal motion and some verbs of metaphorical motion (Smith 1997).

In the appropriate context, (18*a*) could also have the internal meaning of (18*b*). The Progressive often conveys a strong feeling of motion and immediacy, Midgette comments.

The neutral viewpoint appears with verb words that lack overt viewpoint specification as Perfective, Imperfective, or Progressive. We shall call these ZERO-MARKED VERB WORDS. All Navajo verb words convey information about aspectual situation type and viewpoint. The situation type of a verb word can be distinguished as expressing an event or state on morphological, semantic, and distributional grounds (Smith 1995; 1997). Overt aspectual viewpoints focus events as bounded (Perfective) or unbounded (Imperfective, Progressive). Zero-marked verb words have the zero, neutral viewpoint, which is flexible in interpretation. There is a distinction between “situation type” and “event structure” that is relevant to Navajo (Smith and Perkins 2005). Situation type categories are both semantic and syntactic: they have distributional correlates in a language—distinctive patterns of forms that may or may not appear with them (for instance, in English, clauses expressing telic events are typically odd with durative adverbials such as *for an hour*). They are therefore grammaticalized in the sense of Whorf (1956). In contrast, event structure categories are semantic only, without consistent distributional correlates. Event structure in Navajo is conveyed by the verb word. The two-valued features Static/Dynamic, Telic/Atelic, and Punctual/Durative all appear in the word, and there is semantic reason to recognize States, Activities, Accomplishments, Achievements, and Semelfactives.

The situation types of Navajo do not coincide with semantic event structures that are normally posited in semantic ontologies. The features Static/Dynamic and Punctual/Durative have distributional correlates. However, the feature Telic/Atelic does not. Although morphemes indicating telicity appear in telic verb words (Midgette 1996), there are no consistent distributional correlates for telicity. For instance, Navajo does not have distinct adverbials conveying duration vs. completion, e.g., *for an hour* and *in an hour*. The relevant adverbials are flexible and appear with all verb words. Nor does Navajo have verbal pairs such as *stop* vs. *finish* (Smith 1996). The situation types of Navajo, then, are States, Punctual events, and Durative events.

The most important factor for the inference of temporal location is whether or not a situation is “bounded.” Bounded situations have clear endpoints. Telic events, and punctual events, are intrinsically bounded: the bounds are essential to the very notion of these events. In contrast, states and atelic events are intrinsically unbounded. States do not include endpoints, since the transitions into and out of states are themselves events. Atelic durative events have arbitrary endpoints.

Boundedness is expressed overtly by the Perfective viewpoint and by adverbials (Depraetere 1995).³⁴ Whether a given situation is intrinsically bounded may be inferred via the temporal schema associated with the situation expressed in the clause; this is the default interpretation of zero-marked clauses, discussed in 4.2.1. We assume that a temporal schema is associated with the event structure of a clause.³⁵ There is an important difference between the two types of boundedness. Boundedness as expressed by the Perfective or by adverbials is semantic: it is coded by the linguistic forms. The second type of boundedness is pragmatic: it is inferred and may be overridden by information in the sentence or context.

This discussion does not deal with a set of discontinuous morphological categories which combine with the theme to form eventive verb bases; they are known as “aspectual categories” in Athabaskan linguistics (e.g., Young and Morgan 1987:167–89). The categories are recognizable by distinctive patterns of root/stem variation; some also have distinctive prefixes and some occur with particular viewpoint morphemes. There is evidence that these categories are diverse in meaning and function, and that they do not consistently contribute to semantic aspectual meaning (Smith 1996).³⁶ We give some examples to support this point below.

4.2. The default account. There is a well-known default pattern of temporal interpretation for sentences without direct temporal information. As we have noted, the key factor is the aspectual feature of boundedness. In the default pattern, bounded situations are temporally located in the past; un-

³⁴ In this article, we ignore the adverbial expressions of boundedness, e.g., that a situation continued *from x time to y time*.

³⁵ For languages in which event structure and situation type structure coincide, we assume that one temporal schema is available for interpretation.

³⁶ Among these categories, Smith (1996) distinguishes three groups: “lexical,” “super-lexical,” and “formal.” Each contributes aspectual information of a different type to a verb base. Smith calls the categories “Verb lexeme category” or VLCs so as to distinguish them from other aspectual categories. The “lexical” VLCs specifically concern the temporal features of a situation and thus contribute to specifying a given event. Using the labels of Young and Morgan (1987), the lexical bases with the Distributive, the Diversative, the Repetitive, and the Reversative form a subgroup that involves plurality in meaning. There is a second subgroup of lexical VLCs, whose bases are consistent in a single temporal feature; the morphological categories themselves make no specific, identifiable contribution to lexical meaning, however. Transitional bases, and Continuatives under certain circumstances, express events with the feature of telicity; the Conclusive and Durative VLCs express durative events. The super-lexical VLCs are the Curative and the Continuative: they function at a different level, creating derived situation types that express a narrow view of a situation. The formal VLCs are the Momentaneous and the Semelfactive; the former category does not have a consistent meaning or function. The consistency of the latter is in doubt (Smith 1997). Similar categories exist in other Athabaskan languages; see Kari (1979) for discussion of Ahtna and Axelrod (1993) for Koyukon.

bounded situations are temporally located in the present. This pattern is found in a number of languages; we discuss it here only for Navajo, but we think that it holds very generally in languages that have clauses without tense.³⁷

We begin with canonical examples of Navajo. (19*a*) and (19*b*) have the Imperfective viewpoint, (19*c*) has the Progressive; all three are taken as present in the absence of contextual information to the contrary.³⁸ (19*d*) has the perfective viewpoint and is taken as past. The translations reflect the default temporal interpretations:

(19*a*) *Jáan Tségháhoodzánídi naaghá*
John Window.Rock-in around-3subj-impf-go

‘John is hanging out at Window Rock’

(19*b*) *Jáan nídii'nééh*
John up-3subj-impf-crawl

‘John is getting up’

(19*c*) *Íléidi 'atiingóó yigáát*
over-there road-along 3subj-prog-walk

‘He’s walking along the road over there’

(19*d*) *Shimá ch'iyáán ła' bá nahátnii'*
1-mother groceries some 3-for pref-1subj-perf-buy

‘I bought some groceries for my mother’

We explain this pattern with the general pragmatic principles, elucidating and adding to those mentioned above, and extend it to other examples.

The Deictic Principle assures that situations are temporally oriented to Speech Time. The Bounded Event Constraint ensures that bounded events are not located in the present; it makes no other prediction. However, the default interpretation of a sentence expressing a bounded event (e.g., 19*c*) locates the event in the past rather than the future. We invoke a very general principle of information processing to account for this consistent fact of interpretation. When people encounter an incomplete form, they infer additional information to interpret it. They prefer to make the simplest interpretation possible, adding as little as necessary. People often utter sentences

³⁷ For instance, Mandarin Chinese (Smith and Erbaugh 2001; 2005), Thai (Sudmuk 2003), Inuktitut (Bohnenmeyer and Swift 2004), and others.

³⁸ The first two examples differ in their “aspectual” or Verb Lexeme category: (19*a*) has the “continuous” VLC, while (19*b*) is “momentaneous.” The latter is the most heterogeneous of the VLC categories.

that underdetermine an interpretation: they say the minimum necessary (see Grice's second Maxim of Quantity). In such cases, the receiver interprets by filling out what is said with additional information. The simplicity principle constrains the inferences that people make when they infer what is not explicitly asserted:

(20) Simplicity Principle of Interpretation

Choose the interpretation that requires the least information added or inferred.

This Simplicity Principle of Interpretation holds for vision (Kanisza 1976) and is basic to computation and pragmatic reasoning in general, whereas Grice's maxims pertain essentially to communication. This principle applies to temporal interpretation in the absence of direct information.³⁹

The three principles account for the default interpretation of verb words with overt aspectual viewpoints. Verb words with the imperfective and progressive viewpoints express events that are unbounded. They are located in the present.

The location of unbounded situations as present is due to the primacy of the canonical situation of linguistic communication and the Simplicity Principle of Interpretation. Talking about a situation that is current at the time of speech is the simplest kind of temporal location. It requires only one time, the present.

The Bounded Event Constraint limits situations to non-present times. They are located by default in the past. We suggest that this is due to the Simplicity Principle of Interpretation. From a strictly temporal point of view, the future is symmetrical to the past. Both are related to Speech Time: the past precedes Speech Time, the future follows it. But the future also has an element of modality, which adds complexity. In terms of the information conveyed, the past is the simpler: it lacks the factor of uncertainty, or modality, that is always associated with the future. Situations can be located in the future, of course, but explicit information is needed. Information that locates a situation in the future can be conveyed by tense, modal or particle, adverb, or lexical factors such as future-oriented verbs.

To summarize, the first two principles account for the default interpretation in Navajo of event verb words with overt aspectual viewpoints. Verb

³⁹ Two examples of the Simplicity Constraint from English: sentences in the present tense are taken as present rather than future; and, as Steve Crain pointed out at the Nijmegen conference, reduced relative clauses are taken as having a deleted past rather than a deleted future. For instance, the well-known example *The horse raced past the barn fell* is interpreted as a deleted past. The full version is always given as *The horse that was raced past the barn fell*. This is a default interpretation. If the context has *will* and a future adverb, interpretation of the missing form may be future.

words with the Imperfective and Progressive viewpoints express events as unbounded. They are located in the present by the Deictic Principle and the Simplicity Constraint. Verb words with the Perfective viewpoint express bounded events. Due to the Bounded Event Constraint, they are not located in the present. Due to the Simplicity Principle of Interpretation, they are located in the past rather than the future.

To account for zero-marked verb words, we state a corollary principle. What is needed is a way to infer whether a zero-marked verb word expresses a situation that is bounded. To do this, we appeal to event structure, which expresses the intrinsic temporal properties of situations. The principle says that a zero-marked verb word is taken by default as bounded or unbounded, depending on whether the event structure that it expresses is intrinsically bounded or unbounded, as expressed by the associated temporal schema:⁴⁰

(21) Temporal Schema Principle

Interpret zero-marked clauses according to the temporal schema of the situation expressed.

According to this principle, situation types with intrinsic bounds are taken as bounded: telic events and instantaneous events. Other situation types are taken as unbounded.⁴¹ The principle is essentially an extension of the Simplicity Principle stated above. The default interpretation of the neutral viewpoint can be overridden by clauses with direct temporal information, as we show later on. Thus the pragmatic inference of boundedness is quite different from the semantically coded boundedness expressed by the perfective viewpoint.

4.2.1. The default account for verb words with overt viewpoints. The basic deictic pattern is illustrated further below. (22) has verb words with the Imperfective and Progressive viewpoints, both of which express unbounded events. The events are taken as located in the present by the Deictic Principle. This is the simplest possible interpretation since it requires no additional information:

(22a) *Biih* *yish'nééh*
 3-into 1subj-impf-crawl
 'I'm crawling into it'

⁴⁰ The feature of duration is also relevant to some rather delicate cases not discussed here; see Smith and Perkins (2005).

⁴¹ A related notion, "event realization," is proposed for zero-marked sentences in Bohnermeyer and Swift (2004). The authors apply it to Inuktitut, German, and other languages. Lin (2003), discussing temporal interpretation in Mandarin Chinese, uses the notion of event realization. His treatment of zero-marked sentences is quite similar to the approach taken here; see Smith and Erbaugh (2005) for a detailed account along the same lines.

- (22b) *Nléi* *dziłbq̄qhgóó* *hootíłł*
 that-one-over-there mountainside-along areal-prog-rain
 ‘It’s raining there along the mountainside’ (YM 1987:461)

Taking a slightly different point of view, Midgette (1995:66) also notes that verbs words with the Progressive Mode are by default located in the present.

The next examples, in (23), have verb words with the Perfective viewpoint; they express bounded events. The events are taken as located in the past. The Bounded Event Constraint requires that they be past or future; the Simplicity Principle of Interpretation selects the past interpretation:

- (23a) *Hooghan* *binishishnish*
 hogan 3-on-1subj-perf-work
 ‘I did some work on a hogan’

- (23b) *Shimá sání* *chizh* *ła’* *bá* *náníjaa’*
 1p-grandmother firewood some 3-for 1subj-perf-bring
dóó *bá* *didíłłjéé’*
 and 3-for 1subj-perf-build fire

‘I brought back some firewood for my grandmother and built a fire for her’ (YM 1987:564)

We present some non-default cases in 4.3 below. They are essential to the inferential default account: with appropriate additional information, unbounded situations may be located in the past or future and bounded events may be located in the future.

4.2.2. Zero-marked clauses in Navajo. We now consider clauses that are zero-marked for aspectual viewpoint. In Navajo, zero-marked verb words have a mode morpheme that does not convey aspectual viewpoint. This includes state verb words, which have a semantically empty, formal viewpoint morpheme; derived state verb words, with the Customary Mode; and derived Activity verb words, with the Iterative Mode. Event verb words with the Future Mode form another case. We do not deal here with the Optative, which tends to be used in special contexts. Thus we can distinguish state verb words, which are always zero-marked; and derived states; and event verb words. Among the latter, we note derived activity verb words, with the Customary Mode; and event verb words with the Future Mode morpheme.

Next we consider the relevant temporal inferences for examples of each case. For the first two cases, we explain the inference of temporal location; for the third, we consider temporal relatedness, since temporal location is conveyed by the mode.

Recall that the key factor in inferring temporal location is (un)boundedness. In zero-marked verb words, this feature appears only in the temporal schema associated with the verb word. If Navajo zero-marking is like that of Mandarin, as mentioned above, we expect that the default temporal location arises from inference about the temporal schema of a given verb word. More specifically, we expect that states and derived states (event verb words with the Customary Mode) are taken as unbounded. We also expect that event verb words with the Iterative Mode—derived Activities—are taken as unbounded. The prediction of our temporal inference theory is that these verb words will be taken as present by default.

The examples in (24) have simple states; the examples in (25) are derived states, with the Customary Mode, marked *cust*: the tense of the English translations reflects the default inference of temporal location:

(24) States

(24a) *Díí tsé doo ndaaz da*
 this stone neg 3subj-heavy(neut) neg

‘This stone is not heavy’ (YM 1987:654)

(24b) *Sitsilí chidí biyi’ góne’ sidá*
 1-little-brother car inside 3subj-sit(neut)

‘My little brother sits/is sitting in the car’ (YM 1987:204)

(25) Customary Mode: derived states

(25a) *’Abínigo gohwééh yidlííh*
 morning coffee 3subj-cust-drink

‘S/he usually drinks coffee in the morning’

(25b) *Shíígo díí tó ánádííh leh*
 summer-during this water 3subj-cust-dwindle usually

‘This water (stream) usually dwindles in the summer’

The Customary examples have verb bases that are eventive at the basic level.⁴²

Zero-marked event verb words appear with the Future, Iterative, and Optative Modes. The Future Mode is of course temporally located. The Iterative Mode affects the situation type of a verb word, shifting it to a derived atelic event; the Optative, which we do not investigate here, conveys an irrealis situation. Derived atelic events do not have intrinsic endpoints (Smith 1999)

⁴² The Customary or Usitative Mode is conveyed by stem shape only; the Mode prefix is indistinguishable from the Imperfective Mode (Young, Morgan, and Midgette 1992:865). In many verb bases, including the base in (25b), the Customary Mode prefix and stem shape are also indistinguishable from the imperfective.

and their temporal schemas are therefore unbounded, as in (26). We predict that the default temporal inference is to locate them in the present. The Iterative Mode is marked iter:

(26) Iterative Mode: derived Activities

(26a) *Taah náshitééh*
 into-water rep-3obj-1subj-iter-put

‘I repeatedly put him/her into the water’ (YM 1980:105)

(26b) *’Awéé’ náchah*
 baby rep-3subj-iter-cry

‘The baby cries over and over again’

The default temporal interpretations are as predicted: all are present. In each case, the event structure of the situation expressed is unbounded. States constitute a distinct situation type in Navajo; Activities, however, do not. But since the derived Activities in (26) have an overt morpheme conveying the relevant information, one might argue that all of these cases involve grammaticized situation type information.

We now turn to other event verb words, which appear only in the Future Mode. Since they are temporally located by the Future Mode morpheme, the temporal inferences involve other factors. We consider verb words of durative events with the temporal adverbial *t’áá lá’í ’ahwéé’ílkidjì* ‘up to an hour’. Here the relevant temporal inference has to do with the meaning of the adverbial.⁴³ We show that this adverbial varies in interpretation according to whether a clause is telic or atelic; recall that, in Navajo, this is a matter of event structure. With atelic verb words, the adverb describes the run-time of the event, with the translation meaning ‘for an hour’ (during). With telic verb words, it also gives the run-time of the event, but the run-time terminates with the telos or natural endpoint. The gloss for this is ‘in an hour’ (completive). (27a) and (27b) express durative atelic events, (28a) and (28b) durative telic events; *cess* in (28b) is the cessative morpheme:

(27) Durative, atelic

(27a) *T’áá lá’í ’ahwéé’ílkidjì nidi’ nítkat*
 one hour-pass-up.to 2subj-fut-herd (sheep)

‘You will herd sheep for an hour’ (during)

(27b) *T’áá lá’í ’ahwéé’ílkidjì ’awéé’ ’iidoolhosh*
 one hour-pass-up.to baby 3subj-fut-sleep

‘The baby will sleep for an hour’ (during)

⁴³ We thank Mary Ann Willie for pointing out the relevance of this adverbial to our inquiry.

(28) Durative, telic

(28a) *T'áá lá'í 'ahwéé'ílkidjì' naaltsoos 'altso*
 one hour-pass-up.to paper all-of-it
'adeeshlítí
 3obj-1subj-Fut-make (indef obj)

'I will write the whole paper in an hour' (completive)

(28b) *T'áá lá'í 'ahwéé'ílkidjì' kintahjì' bichidí*
 one hour-pass-up.to town-to 3-car
nidoobąs
 cess-3subj-Fut-drive

'S/he will drive his/her car to town in an hour' (completive)

(27a) needs the adverb *'altso* 'fully, completely' for the telic interpretation. (28b) needs the morpheme *ni* expressing the final endpoint. In these cases the adverb conveys the duration of SitT—that is, the run-time of the event. Because *t'áá lá'í 'ahwéé'ílkidjì'* entails that the event being modified has a duration of one hour, this adverb, like others that include the enclitic *-jì'*, is usually not acceptable to Navajo speakers for most punctual events. For the ingressive reading, in which the adverb conveys the time until the event occurs, the adverb must have the enclitic *-go*:⁴⁴

(29) *T'áá lá'í 'ahwéé'ílkidgo doogááł*
 one hour-pass-after-go 3subj-fut-come

'S/he will arrive in one hour' (after)

This section shows that telicity, a feature of event structure in Navajo, interacts with the interpretation of a key temporal adverbial. The adverbial is always interpreted as the duration of a temporal interval. What varies as the result of event structure is the final endpoint of the interval. Another case of zero-marked verb words is discussed in Smith and Perkins (2005).⁴⁵

Together, the pragmatic principles we propose account for the default temporal interpretation of sentences without direct temporal information. By the Deictic Principle, situations are located with respect to Speech Time. By the Bounded Event Constraint and the Simplicity Principle of Interpretation, unbounded situations are located in the present and bounded

⁴⁴ In (29), it happens that RT = SpT because it is a fairly simple example.

⁴⁵ The other case studied in Smith and Perkins (2005) involves complex sentences with the Future Mode. Two events are related by a subordinating morpheme with a temporal meaning; the subordinator allows an interpretation of simultaneous or sequential events. For this case, whether the events are durative or punctual determines interpretation.

events are located in the past. The boundedness of a situation is the key factor. By the Temporal Schema Principle, the situations of zero-marked clauses are taken as bounded or unbounded according to the temporal schema of the situation type they express.

4.3. Non-default sentences. The default interpretations given above do not exhaust the possibilities. Unbounded situations can be located in the past or the future and bounded events can be located in the future, provided that direct temporal information is available. In this section we provide examples in which direct temporal information appears in a single sentence; the information could be provided in the context as well.

Unbounded situations are expressed by verb words with the imperfective or progressive viewpoint and by certain zero-marked verb words. When they appear with direct temporal information, e.g., temporal particles and adverbs, they may be located in the past or future. The examples below express situations that are located in the past. (30a) has the Imperfective in one clause, the Progressive in another. It includes the past adverb *'adááddáá'* and the past particle *ńt'ée'*.⁴⁶ In both examples, the enclitic *-go* is a subordinator. (30a) is cited by Midgette (1987:94), who observes as we do that explicit information is needed to locate a progressive in the past; the same is true for the imperfective. (30b) is a state:

(30) Unbounded situations located in the Past

(30a) *'Adááddáá'* *na'nishkaadgo* *dzilbqahgóó*
 yesterday around-1subj-impf-herd+GO mountainside-along
 hoołtítł *ńt'ée'*
 3subj-prog-move PPrt

'Yesterday, while I was out herding, there was a rainstorm moving along the mountainside'

(30b) *Lid* *honishchin* *ńt'ée'*
 smoke areal-1subj-smell (neut) PPrt
 'I smelled like smoke' (YM 1987:190)

Unbounded situations, and bounded events, may be located in the future, with an adverbial or the future particle. (31) has unbounded situations in the future. (32) has bounded events, with the perfective viewpoint. (32b) and (32c) exemplify a common pattern: the Perfective of a "motion verb"

⁴⁶ Many speakers say *ńt'ée'* and many say *ńt'éeé'*. The works of Young and Morgan include both spellings as well as *ńt'éeé* and *ńt'éeé*.

is often taken to express an event in the future, especially when there is contextual support for this interpretation, e.g., the adverbs *yiskáago* ‘tomorrow’, *ákóó* ‘then’. (32c) has plural pronouns, marked pl:

(31) Unbounded situations located in the Future

(31a) *'Asháq dooleet*
 1subj-impf-eat PPrt
 ‘I will be eating’

(31b) *Díí ndíshchí' nineez dooleet*
 this pine 3subj-neut-tall FPrt
 ‘This pine is going to be tall’

(32) Bounded situations located in the Future

(32a) *Yiskáago Mary 'altso 'íilta' doo*
 tomorrow Mary complete 3subj-perf-read FPrt
 ‘Tomorrow Mary graduates from school’

(32b) *Hahgo 'ákóó díníyá*
 when-Q there 2subj-start-perf-go
 ‘When are you going there?’

(32c) *Yiskáago nihaa yíníyáago t'áá 'íidáá'*
 tomorrow 1pl-to 2subj-perf-come+GO already
da'iidáá' dooleet
 1pl.subj-perf-eat FPrt
 ‘Tomorrow when you come to see us we will have already eaten’

(32d) *T'áadoo nahóóhtáágoogo shinaadáá' 'altso*
 unless areal-3subj-perf-rain+GO my-corn prt
dadoogááł
 3-Fut-dry up

‘Unless it rains my corn will all dry up’ (YM 1987:716)

The sentence in (32b) has the inceptive morpheme (‘start’ in the gloss); without the question morpheme, such sentences are often taken as located in the future, especially with motion verbs (see Faltz 1998:211). In (32c), the second perfective clause has a future perfect meaning. (32d) has another use of the perfective, in an ‘unless’ clause: the first clause suggests that the speaker does not expect it to rain. These examples show that the perfective can appear in future sentences.

Finally, we provide some non-default zero-marked examples. Such cases have the Customary or Iterative Mode: these are the two modes that specify neither aspectual viewpoint nor temporal location. The sentences in (33) have the Customary Mode and are set in the past and future by temporal particles; iter marks the iterative prefix:

(33a) 'Átchíní daané'é baa náshjih dooleet
 children toy 3-to iter-3obj-1subj-give FPrt
 'I will give toys to the kids customarily'

(33b) 'Átchíní daané'é baa násjih nít'éé'
 children toy 3-to iter-3obj-1subj-give PPrt
 'I used to give toys to the kids (but I don't anymore)'

Without the temporal particles, the default interpretation of sentences in the Customary Mode is present, because these sentences are unbounded.

We have limited ourselves to cases where temporal information is expressed in the same sentence. The default can also be canceled in more complex cases, where information in the context or the common ground locates unbounded situations in the past or future, or bounded events in the future.

In this section, we have looked mainly at the temporal interpretation of Navajo sentences that do not have direct temporal information. The default interpretations are inferred, based on the pragmatic principles.

5. Conclusion. We have shown that Navajo has a temporal system with the Future Mode, an inflectional morpheme that is very close to a tense, and the past and future particles, which are semantically like tenses but are not part of the verb word. The language also has temporal adverbials. All of these forms appear optionally in Navajo sentences and determine the temporal location of the event or state expressed. The possibilities are somewhat different for events and states.

In sentences without direct temporal information, aspect conveys information that allows temporal location to be inferred. We stated a general pattern of default temporal interpretation based on boundedness, and we identified pragmatic principles that predict how the information in particular sentences is interpreted.

The pattern of interpretation, as we noted, is not unique to Navajo. The common identification of perfective viewpoint with past tense, and imperfective viewpoint with present tense, is due primarily to this pattern, which is due in turn to the principles given here.

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