

## Definite and Indefinite Descriptions in Navajo

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### 1. Varieties of Nominals in Navajo.

One of the distinctions between definite and indefinite nominals is that the latter are used to introduce novel information into a discourse, and the former make salient information that is familiar.<sup>\*</sup> In other words, indefinites are used to talk about something not mentioned before in a conversation and definites are used to refer to something already mentioned. In Discourse Representation Theory (DRT), indefinitely construed nominals introduce discourse referents and definite nominals do not. Once a referent has been introduced a pronoun or a definite description can be identified with that referent. This chapter reports the results of our investigation into which Navajo nominal expressions have the capacity to introduce discourse referents, and which are associated with previously established referents. Our goal is mainly descriptive, and so we will use DRT as a descriptive tool in this endeavor.

Of course there are many varieties of nominal expressions in Navajo. We will focus our attention on the following:

- a. bare nouns
- b. Nouns appearing with *lci'*
- c. *dʃ* nominal phrases
- d. *ci* and other pronouns
- e. null arguments of verbs
- f. *h*-nominals
- g. the “indefinite” verbal marker
- h. clitic effects

Bare nouns are nouns that appear without any determiner or particle in the nominal phrase. *lci'* can appear after a noun and is usually glossed as ‘some’. *dʃ* and *ci* can appear before a noun or independently; they are usually glossed as ‘this (one)’ and

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'that (one)', respectively. We will also look at non-deictic pronouns. Regarding (e), since a verb can be a complete sentence in Navajo, nominal phrases are only optionally present in a sentence. We will consider the properties of null (or covert) arguments as well as overt ones. Navajo *h-* nominals are used as question words and sometimes apparently as indefinite nominals. We will consider these briefly. In addition, we will consider whether the verbal prefix 'a, which Young & Morgan (1987) call "indefinite," is indefinite in our sense or in some other sense. Finally, we will briefly identify some definiteness effects involving the *f*-clitic, which attaches to verbs.

We must note that in the work of Jelinek (1989), Willie (1991) and Willie & Jelinek (2000), what we call null arguments are analyzed as overt pronouns that have incorporated into the verb. Hale (this volume) defends an alternative analysis in which these arguments are null. For this reason, we will call them null in this chapter since we have to refer to them somehow, however we would use a neutral term if we could think of one.

Before we begin the investigation, we need to make a distinction between covert arguments and implicit semantic arguments. We will reserve the terms 'null' and 'covert' for syntactic arguments that happen not to be phonetically realized. We will use the term 'implicit' for arguments that are required for the logical interpretation of the sentence but that are not in any sense present in the syntax. An example of this is the food argument in the sentence *Robin ate*. It is not possible for an eating event to take place without something being eaten. However, the verb is clearly intransitive, and English is not a null argument language, so the thing that Robin ate is not represented grammatically by a null argument, but an implicit one.

## 2. The Basics of Discourse Representation Theory.

Discourse Representation Theory (DRT) now has a long history of development. In Montague (1973), indefinite descriptions are composed of a common noun and an indefinite determiner. An indefinite determiner has an existential quantifier as part of its interpretation. Thus, all indefinite descriptions were expected to have existential interpretations. David Lewis' (1975) paper "Adverbs of Quantification" provided the observation that indefinite descriptions do not necessarily have an existential interpretation. Rather, indefinites can be analyzed as restricted free variables that are bound by independently introduced quantifiers. Fodor & Sag (1981) added the idea that indefinite nominals can be treated as ambiguous with respect to whether they are referential or not. It has been shown that indefinites can have intermediate scope between two quantifiers, indicating that the ambiguity proposed by Fodor & Sag is not adequately powerful (Farkas 1981). Kamp (1981) provided a framework consistent with Lewis' observations and set the stage for future work in DRT.<sup>1</sup> Irene Heim's (1982) dissertation independently produced a nearly equivalent system during the same time as Kamp's work. DRT has provided fruitful tools of analysis resulting in a quantity of research over the years that is too

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<sup>1</sup> Groenendijk & Stokhof's (1990 & 1991) Dynamic Montague Semantics (DMG) laid the foundation for a competing theory that maintains the existential quantifier for indefinites while avoiding the problems of Montague's system. A substantial amount of fruitful work has been done in this general framework.

## Definites and Indefinites

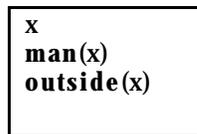
substantial to be listed here. For a recent introduction to DRT see Kamp & Ryle (1993).

In a DRT analysis, discourse referents and formulas are entered into a discourse representation structure (DRS). It is reasonable to think of a DRS as a representation of the Stalnacker's (1978) notion of Common Ground, that set of propositions that the participants in a conversation assume are true of the universe of discourse, plus a list of entities that are assumed to exist for the purposes of the conversation. We say that indefinites express novel information. By this we mean that in uttering *a man*, for example, we cannot be referring to any previously mentioned man. Consider the role of the nominals in the following narrative:

- (1) a. A man was outside.  
b. He walked in.  
c. The man sat down.  
d. A man stood up.

(1a) is talking about someone new in the discourse. This is obviously the case since (1a) begins the discourse. Of course there are ways around this. One could say, *A man was outside. It turned out to be the neighbor I was just telling you about.* Here, the conventions are being exploited to achieve the effect of conveying that the speaker was surprised when the man turned out to be a neighbor. Even in cases like these, the indefinite would be analyzed as introducing a marker that is subsequently identified with a character previously introduced into the discourse. When we get to (1b) we find that the pronoun *he* can be used to refer back to the man mentioned in (1a). This tells us two things. First, the indefinite nominal in (a) introduced what we will call a discourse referent, and second, a pronoun can be identified with a previously established referent. We will represent the effect of (1a) in a DRS as shown below:

(2)

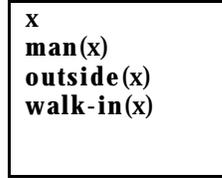


The indefinite nominal introduces the discourse referent  $x$  and the descriptive content **man** with  $x$  as its argument. **Man**( $x$ ) simply means that  $x$  is in the set of men. The predicate *is outside* is represented by the formula **outside**( $x$ ). We disregard temporal information in this discussion. The DRS above was constructed with the following convention:

- (I) An indefinitely construed nominal introduces a discourse referent that is the argument of its descriptive content.

After (1b) is uttered, we have the following:

(3)



This shows that the pronoun *he* does not introduce any information itself; it simply requires the predicate **walk-in** to have an existing discourse referent as its argument.

It is instructive now to ask whether pronouns can introduce referents themselves. If they could, they would be like indefinites in being able to initiate a discourse:

- (4) a. He was outside.  
b. He walked in.

However, this cannot be the beginning of a discourse under ordinary circumstances, except perhaps if the pronoun is being used deictically (Partee 1989, 1973). From these considerations we arrive at the following convention:

- (II) Pronouns are represented by a previously established discourse referent.

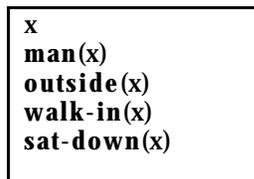
A previously established discourse referent is one that is already in the DRS.

(1c) contains the definite description *the man*. When it is added to the discourse, it is understood that the same man who had been outside and who then walked in is the one who sat down, and not someone else. The analysis in DRT must treat definite descriptions like pronouns in picking up a previously introduced referent. The descriptive content of the definite description serves the purpose of helping the addressee find the correct referent. Since the information conveyed by the descriptive content is already in the DRS, there is no need to enter it again. The information in the predicate is added to the DRS with *x* as its argument. The following convention does what is needed:

- (III) Definite descriptions are represented by previously established discourse referents.

Below is the DRS after the information from (1c) has been added:

(5)



## Definites and Indefinites

Representing definite descriptions in the same way in which pronouns are represented makes the prediction for definite descriptions, as for pronouns, that they should not be able to begin a discourse. This prediction is borne out:

- (6) a. The man was outside.  
b. He came in.

In order to make sense of this discourse, there must be some previously identified man in the common ground. But this means that there must be some previously established referent.

There are two general kinds of violations of convention III; one is a kind of exception to it, and the other involves flouting it to achieve an effect. Authors of stories regularly violate II and III, flouting them quite intentionally, by beginning a story with something like (6a) or (6b). The effect is that the reader feels that something has already been going on even before the beginning of the story. Conventions II and III are the reason for this effect.

The second kind of violation of III involves what has become known as “accommodation” (see Lewis 1979). There are cases in which the discourse context of an utterance makes certain discourse referents available without introducing them explicitly. For example, I can say *This morning I sat down at the table to have breakfast* even if I never told you before that I own a table. Nevertheless, it is perfectly natural to use the definite description *the table*. Similarly, I can tell you *I got in my car and drove to work* (using the definite description *my car*) even if I never told you that I have a car. Where did the discourse referents for the table and the car come from? The standard story is that the hearer is willing to accommodate the existence of objects that are ordinarily found in the context under discussion. Note that I could not say *I got in my firetruck and drove to work* unless you already knew I had a firetruck. The reason for this is that the context of driving to work makes the hearer willing to accommodate the existence of an ordinary vehicle, but not of something out of the ordinary.

These caveats aside, we continue with our analysis of the discourse in (1). (1d) contains another indefinite description. Significantly, the man who is described as standing up in (1d) cannot be the man described in (1a-c). This is exactly what convention (I) leads us to expect. Since indefinites introduce their own discourse referents, they cannot be interpreted as referring to someone already mentioned in the discourse. The only way to add the information in (1d) to the DRS is by adding a new discourse referent. This is shown below:

(7)

x	y
<b>man(x)</b>	
<b>outside(x)</b>	
<b>walk-in(x)</b>	
<b>sat-down(x)</b>	
<b>stood-up(y)</b>	

Thus, the man who stood up is not the man whose behavior was described in (1a-c). This completes the representation of the discourse in (1), and we have now covered the analysis of the simplest uses of nominals within the DRT framework.

We can now begin to test the abilities of the various nominals in Navajo to introduce or pick up discourse referents. Below is a Navajo example that parallels (1):

- (8) a. Hastiin lci' t<sup>o</sup>odi naagh; j n<sup>h</sup>'SS'. A man was walking outside.  
 b. > ʃyah ʃy<sub>i</sub>. He walked in.  
 c. ( / j d<sup>oo</sup> ) hastiin dah neezd; j. (And then) the/A man sat down.  
 d. Hastiin lci' yiiz<sup>o</sup>'. A man stood up.

The English glosses given here fairly accurately indicate the effect each Navajo nominal has on discourse information. In this discourse, a nominal followed by *lci'* behaves exactly like an English indefinite in introducing a new discourse referent. This is evident in the fact that anytime *hastiin lci'* is used, a previously unmentioned man is being introduced into the discussion. This happens in (8a) as well as in (8d). A note about (8a): it is difficult in Navajo to convey only the information that a man was outside without also expressing something about what he was doing, or how he was positioned. This is the reason the gloss in (8a) does not match (1a) exactly. > ʃ in (8b) is understood to be the man who had been outside. Thus, it picks up a previously introduced discourse referent. (8c) differs from the English gloss in that it can be taken to refer to the man discussed in (a) and (b), or it can be understood as introducing a new man into the discourse. Thus, nominals without any accompanying particles appear able to be construed as either definite or indefinite nominals.

(8d) contains a second instance of a nominal containing *lci'*. As we have seen, the same nominal in (8a) introduced a new discourse referent, so we expect it to do so again. We predict that (7d) will refer to an additional man and not one discussed in (8a-c). In fact, this is exactly in accord with our intuitions about the discourse. Two DRSs are possible for the discourse in (8) since, as we noted, *hastiin* in (8c) can be taken to be definite or indefinite:

(9)

x	y
<b>man(x)</b>	
<b>walking(x)</b>	
<b>outside(x)</b>	
<b>walk-in(x)</b>	
<b>sat-down(x)</b>	
<b>stood-up(y)</b>	

x	y	z
<b>man(x)</b>		
<b>walking(x)</b>		
<b>outside(x)</b>		
<b>walk-in(x)</b>		
<b>man(y)</b>		
<b>sat-down(x)</b>		
<b>man(z)</b>		
<b>stood-up(y)</b>		

Our findings thus far are summarized below:

## Definites and Indefinites

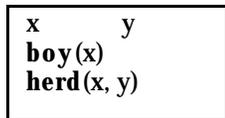
- (10) a. [N *lci'*] introduces a discourse referent that is the argument of its descriptive content.  
 b. > *ʃ* is represented by a previously established discourse referent.  
 c. Bare nouns can be taken either to introduce a new discourse referent or to be represented by a previously established referent.

We can use what we have done so far in a test case. Navajo verbs have a prefix that is traditionally said to be an “indefinite” marker (Young & Morgan 1987). It is represented phonologically by a glottal stop in position IV in the traditional position-class template. The effect of this morpheme is evident in the following minimal pair:

- (11) a. Ashkii dibɕ neini-kaad.                    The boy is herding sheep.  
 b. Ashkii na'ni-kaad.                            The boy is herding (something).

(11b) would be ungrammatical with a direct object in the sentence. There has always been a question of whether this morpheme is truly an indefinite argument or whether it is simply a detransitivizing affix. Either analysis is consistent with the glosses given for the sentences in (11). The assumptions of DRT provide us with a tool to help us answer this question. Let us assume that this morpheme is an indefinite description in the sense of (I), and that it therefore introduces a discourse referent. This means that it should be possible to initiate a discourse with (12a) and that it should have the DRS shown in (12b):

- (12) a. Ashkii *lci'* na'ni-kaad. A boy is herding.  
 b.



Two discourse referents are introduced, one by *ashkii lci'* and one by the “indefinite object” morpheme, following our assumption. Since (9a) does not specify what is being herded, all that is entered in the DRS for the referent  $y$  is the information that it is being herded by  $x$ . (Pragmatically we would expect  $y$  to be something capable of being herded, but this is not a truth condition of the sentence and is at best a quantity implicature.) It should now be possible to continue the discourse with another sentence that picks up the two referents introduced by (9a). Below is an attempt:

- (13)            > *ʃ* *tjidoogish*.                            He will shear it/them.

Since the verb in (12b) is transitive and since the sentence has only one overt nominal in it, *ɕʃ* that nominal must be the object of the verb and not the subject. Since the verb is not reflexive, two distinct discourse referents are required. The unspecified third person subject of ‘shear’ is naturally identified with the boy introduced in the first sentence. As we have already seen, *ɕʃ* must be identified with a previously introduced discourse referent. Since the DRS in (12b) contains two

discourse referents, it predicts that  $\mathcal{C}$  should be able to pick up the  $y$  referent as shown below:

(14)

$x$ $y$ <b>boy</b> ( $x$ ) <b>herd</b> ( $x, y$ ) <b>shear</b> ( $x, y$ )
--

This turns out to be an incorrect prediction. (13) is not an acceptable continuation of (12a). Native speakers report being unable to find a referent for  $\mathcal{C}$ . This is just what we would expect to find if the “indefinite” morpheme could not introduce a referent.

The discourse may, however, proceed as follows:

- (15) a.    Ashkii lci' na'ni-kaad.            A boy is herding.  
       b.    > t̥i'di'doogish.                He will shear.

Now the verb in the second sentence has the same “indefinite” object marker found in sentence (a). If this morpheme were truly an indefinite, (b) would introduce an additional discourse referent. The result would be that the patient of ‘shear’ could not be identified with a previously mentioned entity. This would mean that (15) would entail that whatever it is that the boy is herding, he will shear something else. However, the implicit patient arguments of both verbs in (15) are taken to be the same animals. This is impossible if the glottal stop is taken to be an indefinite description. Neither can we say that the glottal stop involves a definite description with an accommodated referent. Claiming this would make the incorrect prediction for (12–13): (12a) would allow a referent to be accommodated for the patient argument in (12a), which then could be picked up by (13).<sup>2</sup>

(15), then, is an interesting case since both sentences contain implicit arguments that seem to be coreferential, but neither can be expressed syntactically, and they neither introduce nor pick up a discourse referent.

We conclude that the glottal stop does not represent an indefinite argument and in fact it is not an argument at all. It is simply a detransitivizing morpheme and in our analysis it neither introduces, nor is identified with, any argument. Below is the correct DRS for (15):

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<sup>2</sup> In the example below, the first sentence contains an overt patient argument and the second contains the glottal stop:

- (i) a.    Ashkii dibc neini-kaad.            The boy is herding sheep.  
       b.    > t̥i'di'doogish.                He will shear.

We find that the patient of ‘shear’ can but need not be taken to be the sheep mentioned in (a). This is consistent with the patient as a definite description but also with it as an implicit argument.

## Definites and Indefinites

(16)

x
<b>boy</b> (x)
<b>herd</b> (x)
<b>shear</b> (x)

The verbs are all intransitive, and only one discourse referent is used in the discourse. Given this analysis, we must now explain how it is possible for the implicit arguments in (a) and (b) to be identified with the same set of animals if there is no discourse referent available to establish this identification. We would have to consider this to be a matter of pragmatics, perhaps involving an implicature based on the quantity of information provided. However, we are unable to provide an explicit account that is consistent with (16).

Further support for the analysis that the glottal stop is a detransitivizing affix is the judgment of native speakers that in (15b) *ʔ* refers to the one who is to do the shearing, and not to the individuals being sheared. Recall that when a single overt nominal appears with a transitive verb in Navajo that nominal is necessarily parsed as the direct object and not as the subject. Since *ʔ* is not understood as a patient in the activity denoted by the verb, the verb cannot be transitive.

Finally, we consider the interpretations of covert nominals. These are distinguished from implicit arguments in that the former are syntactically realized. We saw an example of a covert nominal in (13): the shearer role is not expressed overtly. We noted that this role is understood in the context to be the boy doing the herding, and that it can be associated with a previously introduced referent. This is how we got *x* as the argument of **shear** in (16). In general we find that covert nominals must be associated with a previously established discourse referent. That is, they are just like pronouns, and this is consistent with the pronominal argument hypothesis in the work of Jelinek and Willie.

Our findings about Navajo nominals are summarized below:

- (17)
- [N *lci'*] (i.e., a nominal expression followed by *lci'*) introduces a discourse referent that is the argument of its descriptive content.
  - > ʔ* is represented by a previously established discourse referent.
  - Bare nouns can be taken either to introduce a new discourse referent or to be represented by a previously established referent.
  - What is traditionally called the “indefinite” object morpheme is a detransitivizer and neither introduces nor is identified with any discourse referents.
  - The covert arguments of verbs appearing without nominal representation are identified with previously established discourse referents.

### 3. Embedded Discourse Contexts.

We have seen how the basic system of DRT works for simple cases in the section above. The main motivation for DRT in the first place came from more complicated cases that appear to be exceptions to the basic conventions identified above. This section considers a number of embedded contexts including wants,

reported speech, modal subordination, and conditionals and quantification. Karttunen (1972) pulled identified a number of related examples. The analysis of quantification and conditionals used here is due to Hans Kamp (1981). The analysis of modals follows Roberts (1985).

### 3.1 Wants and modals.

Some uses of indefinites seem at first glance not to introduce discourse referents. For example, consider the following discourse, joined in progress:

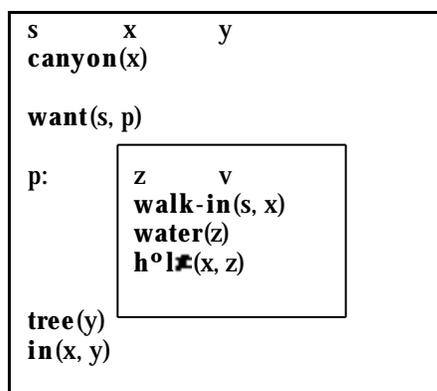
- |      |      |  |                                    |
|------|------|--|------------------------------------|
| (18) | .... |  |                                    |
|      | a.   | Sally bikooh g <sup>o</sup> yaa deesh j j -n <sup>o</sup> zin. | Sally wants to walk in the canyon. |
|      | b.   | T'iis bii' y <sup>o</sup> l'a.                                 | There are trees in it.             |
|      | c.   | ʃshj <sup>o</sup> t <sup>o</sup> h <sup>o</sup> - doo.         | There should be water.             |
|      | d.   | ʃshj j j ada'atiin doo.  | There must be a road.              |
|      | e.   | T <sup>o</sup> bee h <sup>o</sup> .                            | There is water.                    |

In (18a), Sally introduces a discourse referent that is labeled with a constant rather than with a variable, something we haven't seen an example of before. The participants in a conversation must, of course, know the identity of an individual who is named in a discourse. In this sense, names are much like definite descriptions, which refer to previously established referents. However, we will not investigate here the ways in which names are identified with individuals since this issue is not relevant to the topic at hand.

(18a) contains a second nominal, *bikooh g<sup>o</sup>yaa*, a definite description of a canyon. Since this is a definite description, a referent for the canyon must already have been available in the discourse before (18a) is uttered. In setting up a DRS for (18a) we are faced with the question of how to represent the proposition of Sally walking in the canyon. We cannot place **walk-in**(s, x) (where x is the referent for the canyon) in the DRS without some added ornamentation, or the DRS will entail that Sally actually did walk in the canyon, and this would clearly be a mistake. We will say that **want** introduces an embedded discourse context (following, e.g. Farkas 1992) and that some of the information in (18) is introduced into this embedded context. **Walk-in**(s, x) will be introduced only into the context of Sally's wants. There is a clear contrast between the use of information in (18b) and (18c). The former entails that there are actual trees in the canyon; the latter asserts the presence of water but only within the context of Sally's desires. (18c) does not entail that there is actual water in the canyon. This illustrates that information in the scope of a modal is introduced into an embedded context and not into the main DRS. The discourse in (18a-c) is represented as follows (on the assumption that Sally and the canyon were introduced previously):

## Definites and Indefinites

(19)



This DRS was constructed by what Roberts (1989) calls the “insertion approach,” by which the information within the scope of a modal is simply inserted into an embedded DRS.<sup>3</sup> according to the following principle:

(IV) Modals access embedded discourse contexts.

We assume that conventions (I-III) apply to whatever context the nominals happen to appear in. We note further that the referent for the constant *s* can be accessed from the embedded DRS in the formula **walk-in(s, x)** even though the referent itself is in the larger DRS. In fact, it will always be possible for an embedded context to access discourse referents in a DRS that contains it, but it will never be possible for a larger DRS to access a referent introduced in an embedded DRS.

(18d) contains the modal *ʃshjji*, so the nominal *ada’atiin* ‘road’ is introduced in the embedded context. What is interesting about this nominal is that it appears without an indefinite particle (such as *lci*) and yet it introduces a discourse referent. This is consistent with our earlier conjecture that bare nominals in Navajo can be construed either as definite or indefinite descriptions.<sup>4</sup>

The discourse below involves the use of a modal within a modal context, resulting in a double embedding. In the setting for this discourse a boy and a store are already salient and so they can be referred to using definite descriptions:

<sup>3</sup> We adopt this approach for the sake of simplicity. Roberts argues for an alternative called “accommodation of the missing antecedent.” This choice of assumption has no bearing on the results of our investigation.

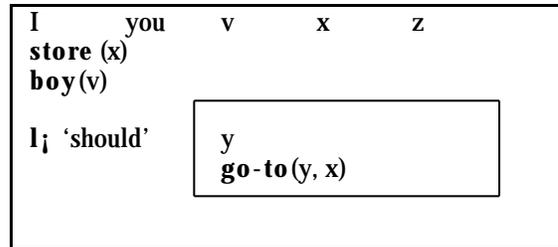
<sup>4</sup> The rich morphology of Navajo raises an interesting question here. *Ada’atiin* is derived from morphemes meaning ‘something leads roadwise down’. Since we are using English glosses in our DRSs, the question of how much of this information should be represented in the logical notation as a nominal and how much as a predicate arises. This matter is not important for the analysis of definites and indefinites, but it will confront anyone doing a logical analysis of Navajo.

- (20) a.  $H_i \uparrow$       $l_i$       $king^{oo}$       $doog_i i^{-?}$   
 who     should     town-to     3-go  
 Who should go to town?
- b.  $Ni$       $daats' \uparrow$       $i k \#$       $d \uparrow n_i i^{-?}$   
 you     maybe     toward     2-go  
 Maybe you will go there?
- c.  $Ashkiigo$   $l_i^{TM}$       $i k \#$       $doog_i i^{-}$   
 boy-go     should     toward     3-will-go  
 The boy should go there.

In this discourse, the speaker first poses the question of who should go to town for some unspecified reason. Mulling over the question, first the speaker considers getting the addressee to go there. Then this possibility is rejected, and the speaker concludes that the boy should go. Of course the speaker does not say that the boy will go, only that he should, and so this information needs to be represented in an embedded DRS.

Below is the discourse structure for the first sentence in context:

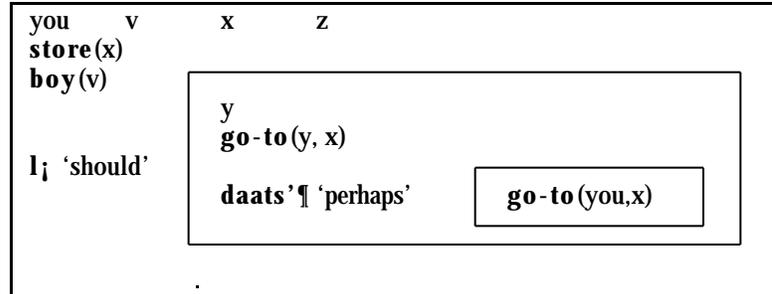
(21)



Because (a) is a content question, the information in it is presupposed and must already be in the DRS before the question is asked, or else it must be accommodated. Because  $l_i$  is a modal an embedded DRS is introduced. The variable  $y$  is associated with a discourse referent representing the question word. Since all this is presupposed, (a) does not add anything to the discourse. Sentence (b) contains the modal  $daats' \uparrow$  and introduces a DRS embedded within the first. This possibility modal is clearly taken to be within the scope of the (deontic) modal  $l_i$ . The effect of this sentence is to identify the addressee with referent of the question word, which we might represent by entering the formula  $you=y$  into the DRS. Although this may be the effect of the sentence, this is not what the sentence says, so the DRS is instead modified as follows:

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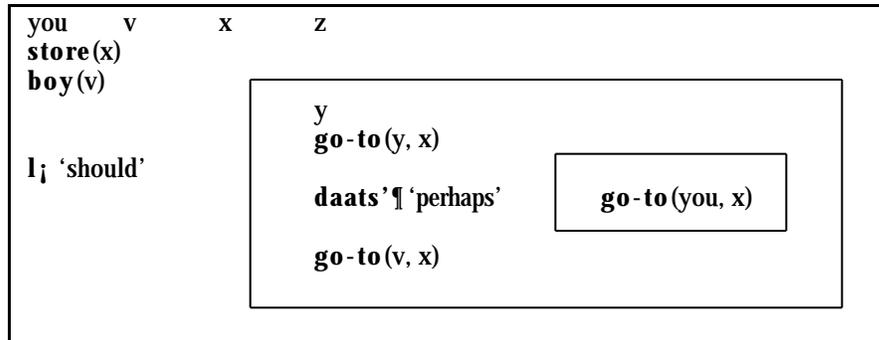
(22)



In saying sentence (c), the speaker expresses the decision that the boy ought to go. The sentence contains the deontic modal *I<sup>TM</sup>*, indicating that the information is to be understood in the original modal context, but outside the DRS labeled *daats'ŋ*. Clearly there is more work to be done to sort out how different modals affect the discourse context that is accessed by information in a particular utterance.

The nominal *ashkiigo* is a sort of nominal we have not considered before. To use a *-go* nominal, there must be some previously established referent that the descriptive content uniquely identifies. If there were more than one referent in the DRS identified with a boy, it would not be felicitous to use *ashkiigo*. The DRS for the completed discourse is shown below:

(23)



As we noted, this discourse is represented with recursive embedding of modal DRSs. We must acknowledge that we do not have an explanation of exactly when the use of more than one modal results in recursive embeddings and when it simply adds information to a single embedded DRS. Clearly the theoretical account is not complete until this can be explained (see Roberts 1989, 1986 for discussion, and see Willie 1996 for more on modals in Navajo).

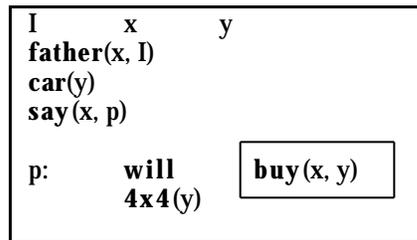
### 3.2 Reported Speech.

Reported speech also can introduce referents in an embedded context:

- (24) a. ShizhC'c chid'łci' nahideeshnih n'ł.  
 My father says he's going to buy a car.  
 b. T' i i d'go yee nidzit'i'g'ł n'ł.  
 It's a 4 by 4 he says.

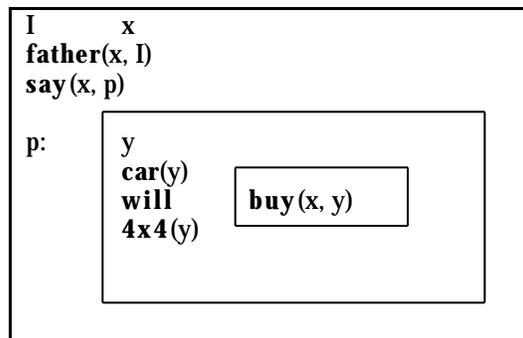
These examples differ from the earlier ones that involved embedded DRSs in that the indefinite nominals appear with different kinds of predicates. In the earlier examples, the indefinite nominals appeared with predicates of existence within embedded contexts. In (24a) the indefinite *chid'łci'* is not the argument of a predicate of existence, but of the verb *nahideeshnih*, 'buy'. This makes it possible to interpret the nominal as referring to something in the actual world and not just in the embedded DRS (see Fodor & Sag 1982). Thus, there are two possible representations for this discourse. In the first, the nominal is taken to be referential in the world of discourse:

(25)



This has the interpretation that there is some particular car that the speaker's father plans to buy. In the alternative representation, the discourse referent for the car is introduced in an embedded DRS:

(26)



The interpretation of this is that there is some car or other that the father says he will buy. It is possible that there is a third interpretation with the referent  $y$  introduced in the future DRS. We will not pursue this here since we only wish to establish that reported speech is represented as an embedded DRS, and that nominals occurring in sentences that introduce embedded DRSs can be construed referentially,

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introducing a discourse referent in the largest DRS, as long as the predicate that the indefinite appears with does more than simply state existence.

### 3.3 Quantification.

Speas & Parsons Yazzie (1996) consider a broad range of Navajo quantificational expressions, and found no instances of “true quantification,” in Mark Baker’s (1995) sense, in which a quantifier A-binds an anaphor. Regardless of the syntactic issues involved, quantificational statements can certainly be made in Navajo (and see Fernald 2000 for a discussion of generic quantification), and they need to be represented in DRT.

Issues of quantification and variable binding, in fact, are what motivated the development of DRT in the first place. The “donkey” sentences below pose a challenge for classical semantics in Montague’s tradition:

- (27) a. Every farmer who has a donkey beats it.  
b. If a farmer has a donkey, he beats it.

Recall that Montague interpreted the determiner *a* with a built-in existential quantifier, rather than as a restricted free variable in DRT. The problem with (27a) is that this existential quantifier is not in a position where it can bind the pronoun *it*. The following is our best attempt at providing a classical translation for (a):

- (28)  $\forall x [[\text{farmer}(x) \ \& \ \exists y [\text{donkey}(y) \ \& \ \text{has}(x, y)]] \rightarrow \text{beat}(x, y)]]$

Of course the variable *y* that is an argument of **beat** is unbound, so the formula is not well formed. (27b) shows the same kind of problem.

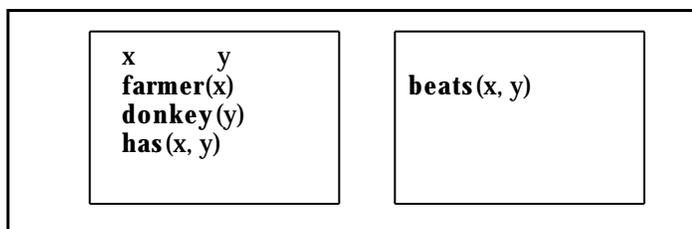
In DRT, all binding is done using discourse referents. However, if *every farmer* introduces its referent in the largest DRS, we would expect a pronoun in a subsequent sentence to pick up the referent. But this is clearly not possible:

- (29) a. Every farmer who has a donkey beats it.  
b. He is annoying.

The pronoun in (b) cannot be bound by the universal quantifier in (a). In addition, any discourse referent that is listed at the top of the DRS gets an existential interpretation. Therefore, the discourse referent introduced in (a) must be in an embedded DRS.

Having established this much, we need to see how to represent the distinction between the restriction and the nuclear scope of the quantifier. If we simply place the restriction and the nuclear scope in the same embedded DRS, we will fail to show that the nuclear scope is dependent on the restriction. The convention in DRT is to represent quantification as two DRSs, side by side, with the restriction on the left and the scope on the right. Below is the representation for (27a):

(30)



This DRS was formed by making two DRSs: an embedded one for the restriction and a second DRS dependent on it for the nuclear scope:

(V) Map information from the restriction of a quantifier into an embedded DRS, and map information from the nuclear scope into a dependent DRS.

Now we note that the DRS representing the nuclear scope does not contain any discourse referent. Clearly the  $x$  in the nuclear scope must be identified with the  $x$  in the restriction. We saw in the discussion of modals that an embedded DRS can access discourse referents introduced in larger DRSs. Now we see that a referent can be accessed from a DRS to the left as well, as long as the DRS on the right is dependent on the one on the left. The general principle of access to discourse referents is stated informally as follows:

(VI) A formula can access a discourse referent within the DRS that contains the formula, or within a DRS to its left, or within a larger DRS.

Still less formally, this means that a formula can look up, to the left, or out to get its referent.

We close this section with a Navajo donkey sentence:

(31) S;anii t'ijij'ni n'z'n'go hast'ni (a') bit'lii  
 women all xx man usually 3-donkey  
 ay'oo iy'o'n'g'ni ay'oo iy'o'n'ni  
 3-3-love-COMP 3-3-love  
 Every woman loves a man who loves his donkey.

### 3.4 Conditionals.

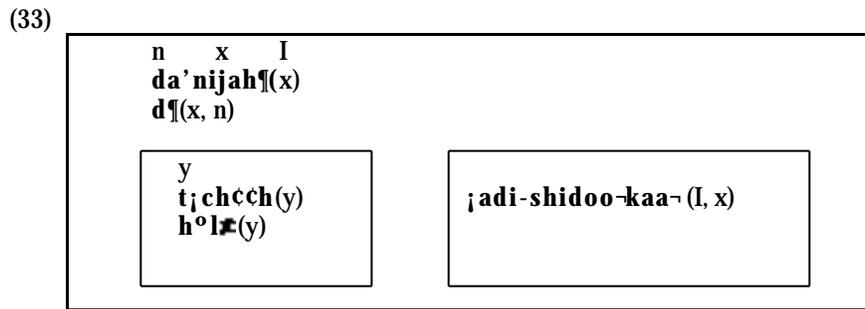
Conditionals can be represented in a similar fashion to quantificational expressions, with the antecedent in one DRS and the consequent in a dependent one.<sup>5</sup> We clearly do not want conditionals to be unembedded since the resulting DRS would incorrectly entail that the antecedent condition is true in the larger context.

<sup>5</sup> See Fernald, Perkins, and Platero (forthcoming) for more on Navajo conditionals.

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- (32) a. Na'nʃhoozhʃdi            da'nijahʃ            hʰlʃ.  
           Gallup                            hotel                            3-exist  
           There is a hotel in Gallup, NM.
- b. Tʃichʃch hʰlʃ-go ʃʃ            ʃadi            shiidoo-kʃ ʃʃ  
           sauna            3-exist TOP            there            dawn-will-come- around-for-me  
           If it has a sauna, I'll stay there.

The first sentence establishes the existence of a hotel in Gallup, New Mexico. The second sentence cannot introduce a referent for the sauna in the same DRS, or it would predict that a sauna actually exists at the hotel. Instead, the conditional introduces a pair of embedded DRSs as follows:



The following convention was used to form this DRS:

(VII) Map information from the antecedent of a conditional into an embedded DRS, and map information from the consequent into a dependent DRS.

Of course, this condition is very similar to condition (V). The consequent of the conditional contains the information that the speaker will stay at a certain location. In the DRS shown, the hotel is identified as the location, but it is possible for *ʃadi* 'there' to pick up any of the referents (except for *I*), meaning that the speaker will stay somewhere in Gallup or in the sauna. As with sentences involving quantifiers, we see that convention (VI) correctly predicts the referents that are accessible.

### 3.5 Negation.

Negation also introduces an embedded DRS. Consider the following sentence:

- (34) There aren't any people that George Washington met left alive.

The indefinite *any people* surely introduces a discourse referent since the object of *met* and the subject of *left alive* must be instances of people that there aren't any of. In classical logic, (34) has the following interpretation (irrelevant details aside):

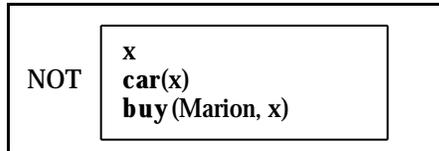
- (35)  $\sim\exists x[\text{person}(x) \ \& \ \text{met}(\text{Geo. Washington}, x) \ \& \ \text{left-alive}(x)]$

Notice that the referent introduced like this in the scope of negation cannot be placed in the largest DRS since doing so would entail that such people exist. Instead, negation must introduce an embedded DRS. Indefinite nominals appearing within the scope of negation will introduce discourse referents either in the embedded DRS or in the largest one, borrowing from Fodor & Sag's (1982) analysis. Thus it should be possible for the following sentence to have two readings:

(36) Marion didn't buy a car.

The most obvious reading is that there is no car that Marion bought. This is obtained by taking a car to introduce its referent within the scope of negation:

(37)



This DRS was created with the following convention:

(VIII) Negation introduces an embedded DRS.

Because the referent appears in an embedded DRS, it is not possible for a subsequent sentence to refer to the car:

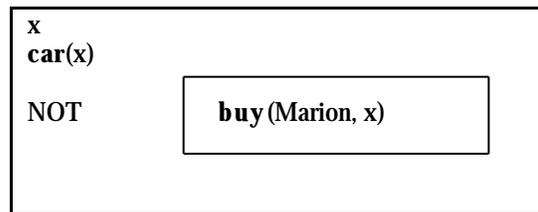
(38) a. Marion didn't buy a car.  
b. It isn't outside.

The other reading for the sentence, there was some specific car that Marion might have bought. This reading is intended for the sentence in the following discourse:

(39) a. Marion didn't buy a car.  
b. He liked it, but it was too expensive.

The following DRS represents this reading:

(40)



In forming this DRS the indefinite nominal was represented as referential.

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Navajo has a two-part negator in the form of *doo...da*. *Da* always appears after the verb, but *doo* can appear in various positions, and its location interacts with the scope of negation in a fairly straightforward manner, although speakers differ somewhat with respect to the relevant judgments. In the following example, *chidʹ* ‘car’ is outside the scope of negation both syntactically and semantically:

- |      |    |              |                     |   |                     |
|------|----|--------------|---------------------|---|---------------------|
| (41) | a. | Chidʹ<br>car | doo<br>NEG          | nah <sub>i</sub> -nii’ da.<br>3-1-buy-NEG | I didn’t buy a car. |
|      | b. | A-tso<br>all | yiichii’<br>3-rusty | l <sub>i</sub> .<br>evidently             | It was all rusty.   |

The scope is verified by the fact that the null argument of *yiichii’* ‘rusty’ can pick up the discourse referent introduced by *chidʹ* in (41). (41a) corresponds to a Fodor & Sag reading. The following discourse does not have that reading, however:

- |      |    |              |                    |                               |   |                     |
|------|----|--------------|--------------------|-------------------------------|---|---------------------|
| (42) | a. | Chidʹ<br>car | doo<br>NEG         | -a’<br>INDEF                  | nah <sub>i</sub> -nii’ da.<br>3-1-buy NEG | I didn’t buy a car. |
|      | b. | A-tso<br>all | yiichii’<br>-rusty | l <sub>i</sub> .<br>evidently |   | It was all rusty.   |

The null third person argument in (b) cannot be interpreted as coreferential with the car from (a). The difference between (41) and (42) is simply that the latter has an indefinite marker within the scope of negation, and that marker is associated with *chidʹ* by giving it an indefinite interpretation. (In most cases, *-a’* appears immediately after the noun.)

### 3.6 *h*-Indefinites.

We can use the tools developed thus far to analyze the discourse properties of other nominal expressions in Navajo. We begin with *h*-question words, which have several similar properties to *wh*-words in English. First, we will see how they behave in questions, and we begin this portion of the discussion with the issue of how to represent questions in DRT.

How do questions affect the flow of information in a discourse? We have been assuming a DRS to represent the common ground, the set of propositions that the participants in the conversation consider to be true, along with the list of entities that are assumed to exist. When a question is asked, we would not be inclined to enter information into the DRS until it has been answered. However, there is a difference between yes-no questions and content questions that is significant for our purposes. Content questions presuppose everything in the sentence except for the phrase containing the question word (a WH word for English); yes-no questions inquire about the truth of a particular proposition. When a yes-no question is answered, we can say that the proposition that corresponds to the answer is added to the common ground, represented by the DRS. However, since content questions presuppose most of the information they contain, they will ask only for more information about something that is identified in the question. Here is an example:



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### 3.7 A final contrast.

Navajo has a variety of clitics that attach to the ends of verbs. These differ from one another in subtle ways. We will not go into a thorough discussion here, but will pause to note a contrast bearing on the definiteness/indefiniteness distinction. The following pair shows this kind of contrast:

- (47) a. Doo nah<sub>i</sub>-nii' da.                      I didn't buy it.  
      b. Doo nah<sub>i</sub>-nii'ɰ da.                     I didn't buy anything.

Neither of these examples have any overt arguments, but they show a contrast between a definite and an indefinite construal. The first example is an ordinary negated sentence. Only the second one has the clitic ɰ on the verb.

Hale & Platero (2000) analyze ɰ as a negative-polarity, cliticized reflex of an indefinite pronoun. As an indefinite, we expect it to introduce a discourse referent. However, since it only occurs in the scope of negation, no pronoun outside the sentence containing the clitic can pick up the referent because negation always introduces an embedded DRS.

## 4. Conclusion.

We have sketched a fairly standard DRT analysis of the interpretation of nominal expressions in a variety of constructions. The constraints we used were kept very informal and we glossed over a number of important details (for example, stating explicitly how DRSs are to be interpreted). Formal versions of DRT are abundant, however, and along with them are explicit accounts of how DRSs are interpreted (see Kamp 1981, Roberts 1989, Kamp & Reyle 1993). Our version of DRT has the following constraints:

- (I) An indefinitely construed nominal introduces a discourse referent that is the argument of its descriptive content.
- (II) Pronouns are represented by a previously established discourse referent.
- (III) Definite descriptions are represented by previously established discourse referents.
- (IV) Modals access embedded discourse contexts.
- (V) Map information from the restriction of a quantifier into an embedded DRS, and map information from the nuclear scope into a dependent DRS.
- (VI) A formula can access a discourse referent within the DRS that contains the formula, or within a DRS to its left, or within a larger DRS.
- (VII) Map information from the antecedent of a conditional into an embedded DRS, and map information from the consequent into a dependent DRS.
- (VIII) Negation introduces an embedded DRS.

Our specific findings about nominals in Navajo are summarized below:

- (49) a. [N *Ici*'] introduces a discourse referent that is the argument of its descriptive content.  
      b. >ɰ is represented by a previously established discourse referent.

- c. Bare nouns can be taken either to introduce a new discourse referent or to be represented by a previously established referent.
- d. What is traditionally called the “indefinite” object morpheme is a detransitivizer and neither introduces nor is identified with any discourse referents.
- e. The covert arguments of verbs appearing without nominal representation are identified with previously established discourse referents.
- f. An *h*-nominal introduces a discourse referent.
- g. -*ʔ*clitics appear to introduce a discourse referent.

Clearly, we have only scratched the surface, but we have laid the groundwork for a more systematic investigation.

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