

Restriction, Saturation, and Classificatory Verbs

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1. Preamble

The English sentence in (1) is ungrammatical, but there is nothing ill-formed about the logical representation in (2):*

- (1) *Robin touched furniture a chair.
- (2) $\exists x$ [touched (r, x) & furniture (x) & chair (x)]

(2) means that something that Robin touched exists and the thing that Robin touched is both furniture and a chair. The pieces of meaning represented by the words in (1) can therefore be assembled into a meaningful proposition. Whatever is wrong with (1) cannot be explained by claiming that the meanings of the lexical units are semantically incompatible.

Linguists offer two kinds explanations for the ungrammaticality of example (1). A purely syntactic answer of the sort common in the literature on the Government and Binding framework is that (1) violates some kind of Case Filter: every nominal argument must receive Case from something in the sentence. The verb *touched* can only assign Case to one internal argument, *furniture* in this example, so the nominal expression *a chair* will not receive Case, and the sentence is predicted to be ungrammatical.

A second kind of answer has to do with argument structure and semantic compositionality. Verbs express relations that are taken to hold between their arguments. *Touched* is a two-place relation (a relation between two arguments), but three arguments are represented in (1). (1), then, cannot express a proposition because the verb is saturated after it composes with two arguments; one argument is left over. How we know there are three arguments in (1) rather than two is something that a theory also must be able to explain, and the explanation lies in the analysis of English grammatical relations. (2) is well-formed because *touched* is interpreted as a two-place relation and the nominals *furniture* and *a chair* are taken to restrict the interpretation of a single argument.

Chung & Ladusaw (2001) points out that sentences similar to (1) are grammatical in certain languages that allow noun incorporation. Chamorro (an Austronesian language of the Mariana Islands) allows both an incorporate to appear within the verb and a coreferential noun phrase to appear outside the verb in the same sentence:

* I am grateful to the participants in the 2002 Athabascan Languages Conference in Fairbanks, Alaska and the participants in the 2002 Navajo Language Academy Workshop in Rehoboth, New Mexico for valuable discussion.

- (3) Gäi-[gä'] un ga'lagu ennao na patgun.
agr.have-pet a dog that L child
'That child has a pet dog.'
- (4) Si Margarita täi-[iyu] kadena
Margarita agr.not.have-possession necklace
'Margarita doesn't have a(ny) necklace.'
- (5) Meggai na taotao man-gäi-[gima'] guma' simentu.
Many L person WH_{nom}.agr-have-house house cement
'Many people have concrete houses.'
- (6) Si Julia gäi-[patgun] yu'
Julia agr.[have-child] me
'Julia has me as a child.'

Chung & Ladusaw point out that in such sentences two nominal expressions are interpreted as restricting the meaning of a single argument. Unlike what happens with (1), when the incorporate composes with the predicate it does not saturate the object argument position; it simply restricts the argument's interpretation. Chung & Ladusaw's monograph develops a theory with two modes of semantic composition: a saturating and a non-saturating, restricting mode. This theory "allows for the possibility that an argument position of a predicate may be targeted by both modes of composition in one [syntactic] construction (Chung & Ladusaw 2001:2-3)." This is what they propose has happened with the Chamorro examples above.

2. Restriction & Saturation

Behind the idea of saturation is the notion that predicates are incomplete in a way that propositions and entities are not. Predicates are said to be unsaturated: they have some sort of hole in them. To illustrate this informally, we can represent a predicate as something like the rectangle below:

(7) 1-place predicates



The hole in the rectangle indicates that it is incomplete. This particular rectangle has one degree of incompleteness, so it represents a one-place predicate. *Sleep* and *laugh* express one-place predicates. *Furniture* and *chair* do also, as indicated by the fact that each has a single argument in the representation in (2). Each one-place predicate needs to compose with exactly one entity type of argument in order to yield a proposition. Until the predicate gets its argument, it is unsaturated (i.e., it has a hole in it) and cannot express a claim about the universe. To be consistent with the representation in (7), a dot is needed to saturate the predicate. Thus, we represent entity types of meanings as dots:

(8) entities



Once the dot fills the hole in the predicate, the result is a solid, fully saturated rectangle. Propositions, then, can be represented as rectangles with no holes in them:

(9) propositions



Because propositions have no holes in them, they cannot compose with anything else in the way the way a predicate does. That is, propositions cannot absorb any additional arguments internally. A proposition certainly can compose with other kinds of meanings when it is absorbed by a larger relation. But it is not predisposed to compose with something the way a predicate is.

We have seen that one-place predicates like *furniture* and *chair* have one degree of incompleteness and can be represented by rectangles with one hole in them. A predicate like *touch* needs two arguments to yield a proposition. It has two degrees of incompleteness and so is represented as a rectangle with two holes:

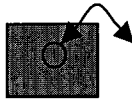
(10) 2-place predicates



Each time *touch* composes with an argument one of its holes is filled. After it composes with two arguments it is completely saturated. At least part of the problem with (1), then, is that there is an argument left over after *touch* is saturated.

A modifier that modifies an argument restricts its interpretation without saturating the argument position of its functor. The effect is to add information to a proposition, or make it “bigger”, so to speak. To represent this with rectangles and dots, we are simply adding to the rectangle of the main predicate. To approximate the effect this has on a formula representing the logical interpretation of the sentence we can link the information in the modifier to the argument being modified. To represent this linkage, we will use an arrow:

(11) modifier



The result of composing a modifier with a two-place predicate would look like this:

(12)







How the Athabascan languages fit into the picture just sketched is a fairly large question. This paper focuses on a particular part of that question, considering the analysis of classificatory verbs and also limited examples of nominal incorporation. First, however, we consider the cases of sentences in general with examples from Navajo:

(13) Ninishchéeh.
 I-chase-it
 I'm chasing it.

(14) Télii kǫ́' bighanjǫ́' ninishchéeh.
 burro horse corral-to I-chase-it
 I'm chasing the donkey to the horse corral.
 (cf. Télii t'ah dóó kǫ́' bighanjǫ́' ninishchéeh da.
 'I haven't as yet chased the burro to the horse corral.' YM 1987d:649)

As is well known, most Navajo verbs are complete sentences all by themselves (as seen in example (13)), but they frequently have overt nominals and postpositional phrases that serve to provide more information about the arguments or other participants. (14) is an example of the latter.

The fact that a verb can be a sentence by itself suggests that it is fully saturated. Such a view is consistent with the Pronominal Argument Hypothesis (see Jelinek 1989, Willie 1991, Jelinek and Willie 1996, Willie and Jelinek 2000) according to which the pronominal morphemes within the verb word saturate the argument positions that the verb base has. So the verb base (the stem plus thematic and derivational prefixes) has a predicate as its denotation; the pronominal prefixes are the arguments that saturate the predicate. Analyzing the example in (13), we have the following:

(15) Verb base:	ni- ni- chéeh	'chases'	
Object argument:	∅	3rd	
Subject argument:	sh-	1st	
Verb word:	ninishchéeh	'I'm chasing it'	

The solid rectangle represents that the verb word is saturated. I have left circles inside it simply to indicate how it got that way. A representation that is more faithful to the underlying logic would simply be a solid rectangle because once a predicate is fully saturated, there is no way to see whether the proposition is built on a one-place or a two-place predicate.

Faltz (2000) is an exploration of the consequences that the Pronominal Argument Hypothesis (hereafter PAH) has for the semantics of a language. He argues that such a language could not have syntactic (as opposed to morphological) constituents that are fully unsaturated. Faltz also concludes that nominals are saturated rather than being interpreted as generalized quantifiers. Consistent with the syntactic assumptions of the pronominal argument hypothesis, Navajo nominals are not arguments and Navajo verbs are not functors. Both constituents are fully saturated. No variable introduced by the nominal constituents could be bound by any non-dynamic quantifier because attempting to bind them in this way would result in illicit capture. The modification strategy illustrated in (11) and (12) is successful only when the argument being

modified has not already been saturated. The PAH analysis of Navajo cannot rely on modifiers like (11). Instead, nominals are interpreted as propositions, represented graphically as solid rectangles. Their interpretations are related to the pronouns they modify in the manner of discourse anaphora (see e.g. Kamp 1981 or Groenendijk & Stokhof 1990).

The PAH, which was developed within the Government & Binding/ Principles & Parameters syntactic frameworks, analyzes overt nominals as adjuncts.¹ In these frameworks, adjuncts are normally assumed to appear freely in sentences and the number of adjuncts possible within a given sentence is limited only by each adjunct's ability to sensibly modify the constituent to which they are adjoined. These assumptions lead to the question of why Navajo never has multiple adjuncts modifying a single argument (for example, *Jáan 'ashkii yiztał* 'John kicked the boy' cannot mean something like 'a boy named John kicked him/her/it' or 'She/he/it kicked a boy named John'; and **Jáan 'ashkii 'atééd yiztał* is ungrammatical). In the rectangle and dot schematics I have been using the question is as follows: why, if one solid rectangle (representing a nominal) is permitted to attach to another (representing a verb word) is there any limit to the number of rectangles that can attach in this way? Willie & Jelinek (2000) proposes an explanation for this that involves the nominal adjuncts appearing in unique topic and focus positions. It is not my purpose going into this here; I mention it to indicate where a solution to the matter may lie.

We turn now to the analysis of these phenomena in the alternative framework, the Null Argument Hypothesis (NAH) (assumed in Platero 1978, Speas 1990, 2000 Hale 2000). The NAH is based on the assumptions the verb is not fully saturated when it is inflected. Overt nominals are interpreted as entities that saturate the predicate, and null arguments are generally available provide this saturation instead of overt ones. Nominals in the assumptions of the NAH--both overt and null ones--are treated as dots. The analysis of one-word sentences like (13) would be that null pronouns are actually present and their interpretations, represented graphically as dots, saturate the verb.

With both sets of syntactic assumptions, the pronominal prefixes on the verb, whether they are taken to be arguments or agreement modifiers, provide some information about the verb's arguments. This information is then unified with the interpretations of any overt nominals that appear in the sentence. Only one of these elements can do the saturating, of course, since once an argument position is saturated it cannot become re-saturated. A similar phenomenon is evident with classificatory verbs. The predicate that the verb base has as its denotation contains information about one of the arguments, but that information does not saturate the corresponding argument position.

¹ In Chung & Ladusaw's (2001) system, it is possible for syntactic adjuncts to serve as logical arguments. Faltz's system does not work this way. A careful comparison of Faltz (2000) and Chung & Ladusaw (2001) would be profitable, but I leave this exploration for another occasion.

3. Classification

There is a rich literature on classificatory verbs in Athabscan. See for example, Hoijer (1945), Krauss (1968), Axelrod (1990), and Rushforth (1991).

3.1 Navajo

Some examples of Navajo classificatory verbs with a common root but differing derivational prefixes are shown below:

- (16) (JOOL: non-compact matter) (Young 2000:4-5)
- | | |
|--|---|
| 'Aghaa' bikáá'adání biyaadéé' háátjool | 'I took the wool out from under the table.' |
| Sitsi' sitsiigháshchíín shá shik'iidíftjool | 'My daughter put my wig on for me.' |
| Kin bikáádéé' 'aghaa' ła' 'adáátjool | 'I tossed/dropped/lowered some wool from the roof.' |
| Níyolgo shich'é'édáá'gi ch'il deeníní naajool | 'A tumbleweed is tumbling around in my dooryard.' |
| Tsiigháshchíín yishjotéé' shílák'ee háájool | 'The wig that I was carrying fell out of my hand—I dropped it unintentionally.' |
| Sitsiigháshchíín tsásk'eh bikáa'gi dah shijool | 'My wig is lying on the bed.' |

And below are examples of verbs with common derivational prefixes but different stems:

- (17) ha- 'up, out' (position Ib) [biyaa 'under him/her/it ']
- | | |
|-----------------|--|
| Biyaa haashheeh | 'to take it (LPB) from under him/her/it.' (YM 1987:432) |
| Biyaa haashjááh | 'to take it (PIO1) from under him/her/it.' (YM 1987:433) |
| Biyaa haashjiid | 'to lug it (LUG) from under him/her/it.' (YM 1987:433) |
| Biyaa haashjool | 'to get it (NCM) from under him/her/it.' (YM 1987:433) |
| Biyaa haashkaah | 'to take it (OC) from under him/her/it.' (YM 1987:433) |
| haashkaaf | 'to chop it out' (YM 1987:433) |
| Biyaa haash'á | 'to send him/her out from under him/her/it.' (YM 1987:434) |
- etc.

Classificatory verbs are used for events of handling, independent or conveyed motion or propulsion, chewing or eating, and for staves dealing with positions or postures (see Young & Morgan 1987g:251-263 and Young, Morgan, & Midgett 1992:1097-1101). Young, Morgan, & Midgett (1992) list the following primary object classes for staves of position:²

1. Single Solid Roundish Object (SRO)
2. Non-Compact Matter (NCM)
3. Open Container (OC)
4. Slender Flexible Object (SFO)
5. Slender Stiff Object (SSO)

² This classification does not hold for every sort of classificatory verb (see de Reuse 2001 for further discussion of the range of classificatory categories).

6. Animate Object (AnO)
7. Mushy Matter (MM)
8. Load, Pack, Burden (LPB)
9. Plural Objects¹ (PIO¹) several large objects
10. Plural Objects² (PIO²) profusion of small objects
11. Flat Flexible Object (FFO)
12. Anything carried on one's back (LUG)
13. Anything moved by streaming or pouring (STREAM)

It is common to claim that the argument that is classified is either the object of a transitive verb or the subject of an intransitive verb. Willie (2000) connects this idea to absolutive case marking systems. Fernald & Willie (2001) claim that the classified argument is one that is interpreted as a theme. However, there are classificatory verbs that do not fit these generalizations. Below are some examples:

- (18) a. Tsé tsin bee nídííłhaal. 'I hit the rock with the stick.'
 rock stick with-it hit
 b. Tsin tsé bee nídííłne. 'I hit the stick with the rock.'
 stick rock with-it hit

In these examples, the argument that is classified by the verb plays the role of the instrument in the hitting event, not the theme (which would be the entity that was hit), and it is represented syntactically by an oblique object, not a direct object. The direct object, which is interpreted as the theme, is not classified by the verb. The examples below show that the postpositional phrase indicating the instrument can be omitted:

- (19) a. Tsé nídííłhaal. 'I hit the rock with the FFO.'
 b. Tsin tsé bee nídííłne. 'I hit the stick with the SRO.'

The verbs in (19) classify the entity being handled by the agent, but this entity is not represented in syntax as the direct object, nor is it the participant that receives the action described by the verb.

3.2 A Parenthetical Discussion of Coercion

Willie (2000) proposes that Navajo classificatory verbs have two levels or tiers of semantic structure at which distinct predications occur:

- (20) **Tier 1 (Event type tier)** Specifies the position or movement of an entity. (stage-level)
Tier 2. (Classification tier) Assigns certain properties to the object by virtue of the verb's classificatory features. (stage-level or individual-level)

Willie notes that the tier that describes the type of event being described is always stage-level (see e.g., Carlson 1977, Fernald 2000), while the classification tier is normally individual-level.

Willie notes further that the classification tier is stage-level only when coercion has been triggered by a mismatch between the predicate and the argument. The (b) examples below are such cases; the nominal expression does not denote an entity with the physical characteristics required by the verb's classification features (Willie 2000, see also Rushforth 1991):

- (21) a. gish sitá
cane 3sgNOM:inanimate-rigid-object-lay
'There is a/the cane.'
- b. k'ad eii lééchą́'í tóó sitá
now that dog too 3sgNOM:stick-like object-lay
'That dog is just too skinny now.'/ 'The dog is dead.'
- (22) a. eii 'atoo' ła' shá haníkaah
that soup some 1sgBEN 3sgACC.2sgNOM:dip-out-liquid
'Dip me out some of that soup.'
- b. eii 'atoo' ła' shá hanítteeh
that soup some 1sgBEN 3sgACC.2sgNOM:dip-out-mushy
'Slop me out some of that soup.'
- (23) a. ashkii sidá
boy 3sg NOM.sit-animate
'The boy, he is sitting.'
- b. ashkii sitléé'
boy 3sg NOM.sit-mushy-stuff
'The boy, he is sitting like a lump (being obstinate).'

Fernald & Willie (2001) formalized the analysis of coercion (building on Fernald 2000) as follows:

- (24) Coercion: Let α be an individual-level predicate with interpretation α' . α can be used as a stage-level predicate with the following interpretation:

$$\lambda I_j \lambda x \exists Q [Q(x, I_j) \& G_{y,l}(Q(y, l))[(\alpha'(y))]]$$

This analysis assumes, following Kratzer (1988/1995) that the crucial distinction between individual-level predicates and stage-level predicates is that stage-level predicates have spatio-temporal arguments and individual-level predicates do not. The I variable in these formulas ranges over spatio-temporal locations. Below is an example of Willie's (2000) double-tiered interpretation, as formalized in Fernald & Willie (2001):

- (25) a. Béeso nídiiltsoos. 'A (\$5) bill, I found it/picked it up.'
money 3sgACC:1sgNOM:FFO-found

Event type: [money (x) & found(I, x, I)]
Classification: FFO(x)

- b. Béeso ndiinil. ‘Coins, I found them/picked them up.’
 money 3sgACC:1sgNOM:PIO-found

Event type: [money(x) & found(I, x, I)]
 Classification: PIO(x)

The variables in these formulas (which represent only the part of truth-conditional meaning that is contributed by the grammar) are left free since, in these examples, they represent indexicals. I continue to assume that indexicals are bound in discourse context and not in the output of the grammar.³

We turn now to the analysis of sentences in which coercion has occurred. The coerced interpretation is gotten simply by applying the operation in (19). The ## symbol indicates that the nominal interpretation is incompatible with the classificational requirements of the verb. This incompatibility triggers coercion:

- (26) a. K’ad eii lééchaq’í tóó sitá
 now that dog too 3sgNOM:SSO-lay
 ‘That dog is just too skinny now.’/ ‘The dog is dead.’

Event type: [dog (x) & lie(x, I)]
 Classification: SSO(x)

- b. Coerced interpretation:
 Event type: [dog(x) & lie(x, I)]
 Classification: $\exists Q [Q(x, I) \& G_{y, I}[Q(y, I)][SSO(y)]]$

- (27) a. Ashkii sitléé’
 boy 3NOM-MM-sit
 ‘The boy, he is sitting like a lump (being obstinate).’

Event type: [boy(x) & sit(x, I)]
 Classification: MM(x)

- b. Coerced interpretation:
 Event type: [boy(x) & sit(x, I)]
 Classification: $\exists Q [Q(x, I) \& G_{y, I}[Q(y, I)][MM(y)]]$

The interpretation that results from coercion is a proposition that the entity in question is an argument in a stage-level eventuality that generally would entail that the entity had the individual-level property named by the individual-level classification of the verb (see Fernald 2000:65-71 for discussion of related phenomena).

³ See Fernald & Willie (2001) for a discussion of why it is difficult to say how the two tiers are related to each other logically. Obvious possibilities are that they are associated by logical conjunction or that the classification tier is presupposed, but there are difficulties with either of these assumptions.

3.3 Slave

Slave, unlike Navajo, allows incorporation of various constituents into the verb. I am concerned only with noun incorporation in this discussion. Below are some object incorporation paradigms from Slave (Rice 1989:663):

- (28) a. nɪlaw'éné rákee hé ríw'irineh'a
 2sg.finger two with 2sg.point finger
 'You sg. Point two fingers.' (Hr)
- b. nɪlaw'éné rákee rírineh'a
 2sg.finger two 2sg.point finger
 'You sg. Point two fingers.'
- c. rákee hé ríw'irineh'a
 two with 2sg.point finger
 'You sg. Point two fingers.'
- d. *nɪlaw'éné rákee ríw'irineh'a
 2sg.finger two 2sg.point finger
- (29) a. téh nákee t'áh k'ínatéhetj
 cane two with 3.walks-around-with-cane
 'S/he is walking with two canes.' (Bl)
- b. téh nákee k'ínatj
 cane two 3.carries-around-stiklike-O
 'S/he is walking with two canes.'
- c. nákee t'áh k'ínatéhetj
 two with 3.walks-around-with-cane
 'S/he is walking with two canes.'
- d. *nákee k'ínatéhetj
 two 3.walks-around-with-cane
- (30) a. nɪlakw'éné 'eyá t'áh tekw'inineh'a
 2sg.finger sick with 2sg.put-2sg.finger-in-water
 'You sg. soak your sore finger' (Bl)
- b. nɪlakw'éné 'eyá tenineh'a
 2sg.finger sick 2sg.put -in-water
 'You sg. soak your sore finger.'
- c. 'eyá t'áh tekw'inineh'a

sice with 2sg.put-2sg.finger-in-water
 'You sg. soak your sore finger.'

- d. *nɪlakw'ené 'eyá tekw'inineh'a
 2sg.finger sick 2sg.put-2sg.finger-in-water

Rice uses these examples to show that sentences are grammatical whether the nominal has incorporated or not. In general, incorporating the nominal does not change the meaning, although this is not the case for every type of incorporation in Slave (Rice 1989:662). However, some of Rice's examples resemble body part incorporation in Koyukon discussed by Axelrod (1990) in that the non-incorporated version describes a situation that is not stereotypical for using the object:

- (31) k'énatéhetɪ 'S/he carries, walks with a cane.'
 téh k'ínatɪ 'S/he is carrying around a cane (in hands)'
- (32) raxeeyeh'a 'I am packing it back.'
 xee rayeh'a 'I am carrying the full pack back in my arms.'

In addition, and most relevant for the present discussion, sentences are not grammatical with both an incorporated nominal and an unincorporated nominal direct object restricting the interpretation of a single argument. Instead, a postpositional phrase must be used if the argument is to be modified outside the verb.

Rice (1989:666) notes that the following examples, however, are acceptable with an unincorporated object as well as what appears to be an incorporated object. Rice proposes that *xa* has an adverbial function in these cases, and this is consistent with the fact that adverbs can incorporate in Slave. *Xa* here would presumably modify the manner in which the action is entailed to occur:

- (33) beghá xarehwee 'I cut the hair (I hair-cut the hair)' (Hr)
 3.hair 1sg.cut hair
 cf. xa, -ghá 'hair'
- (34) turi xahdlá 'S/he plucks the duck (s/he hair-pulls the duck)' (Hr, Bl)
 duck 3 plucks

The conclusion is that incorporated objects in Slave occupy an argument position and appear to saturate the predicate. The argument they introduce, however, can still be modified by constituents outside the verb, indicating that existential closure must be higher than the verb.

3.4 Ahtna

Ahtna allows the simultaneous occurrence of object incorporation into a classificatory verb with the appearance of a direct object:

- (35) taan¹ elongated inc is in position inc#G+Ø+taan
 k'a' niłdaagga (niłdaak'e?) ke+xa+ne+taan
 gun doorway against+weapon+G+elong-O-in-position
 'A gun is leaning in the doorway.' (Kari 1990:320)

In cases like these, at least three pieces of the sentence are contributing to the meaning of one of the arguments: the classification tier in the meaning of the verb base, the incorporate, and the direct object.⁴ There are also cases in which the incorporate is not the classified argument:

- (36) tsets ta+da+tiit
 wood water+G+cause-elong-O-to-move
 'Wood is floating along (prog)' (Kari 1990:321)

Here it is possible, however, that the incorporate *ta* is more like a Navajo thematic prefix than an incorporate.

4. Conclusions

Navajo, Ahtna, and Slave all allow overt nominals to appear with classificatory verbs. Ahtna and Slave allow object incorporation into classificatory (and other) verbs. Ahtna allows an unincorporated direct object to appear in a sentence along with an incorporated one. The consequences these facts have for a theory of saturation depends on the syntactic analysis--PAH or NAH--adopted for each language.

For Navajo, either set of syntactic assumptions results in the conclusion that the classificatory features of classificatory verbs restrict arguments rather than saturate argument positions. The fact that an overt nominal can appear with a verb that classifies it is conclusive evidence only if one assumes the Null Argument Hypothesis. If one assumes the Pronominal Argument Hypothesis, the permissibility of overt nominals is not evidence for whether the verb is saturated. Because the pronominal prefixes saturate the predicate, assuming the PAH, the fact they are present in classificatory verbs is conclusive evidence that the classificatory features do not saturate the verb base. The same can be said of the classificatory verbs in Ahtna and Slave.

As seen in the discussion of data earlier, unincorporated nominals can appear along with an incorporate of the same argument in Ahtna but not in Slave. If we assume the NAH we conclude immediately that the incorporate saturates the predicate in Slave but not in Ahtna; in Ahtna, the incorporate restricts the interpretation of the argument in question.

If we wish to employ the PAH to account for the facts of Ahtna and Slave there is a bit more to be. According to the PAH, pronouns always do the saturating.⁵ Willie & Jelinek (2000), as we have noted, treat issues involving the number of nominals that can appear in a sentence by appealing to the analysis of topic and focus. For the PAH, the difference between Slave and Ahtna, then, is not whether the incorporate saturates the predicate but whether the incorporate has the same discourse status that nominal adjuncts have. Whatever mechanism prevents more

⁴ It also seems likely that gender (indicated by *G* in the gloss) contributes to the meaning of the same argument in a minor way, but I leave the investigation of this matter for future work.

⁵ Here we set aside issues about propositional attitudes.

than one Navajo adjunct from modifying a single pronominal argument is what is responsible for preventing unincorporated objects to appear alongside incorporated ones in Slave. In Ahtna, if we are to maintain a pronominal argument analysis it, incorporates do not have this status. Certainly these observations deserve to be checked out in greater detail. One question to be answered is, what is the relationship between Slave incorporates and topichood? I leave this and related questions for another investigation.

5. Remaining Questions

A substantial question remaining for the analysis in this paper is about the exact nature of the restrict operation. When it ties together modifying information with the information in the verb phrase does it do so by logical conjunction, or by presupposing the modifying material, or something else? Fernald & Willie (2001) includes a brief discussion of this issue. Note also that Axelrod (1990) and Rice (1989) discuss incorporates that function as manner adverbials. This suggests that they are interpreted as functions from predicate type to predicate type.

Questions not addressed here at all are: Why only certain noun-verb pairs can undergo incorporation?⁶ Why do different Athabascan languages behave differently? What is going on with sentences in which the meaning of the independent nominal is completely redundant to the incorporate (if the meanings are indeed completely redundant)? And finally, how gender is related to this discussion?

I take it to be an open question whether the PAH or the NAH makes better predictions for each of the Athabascan languages. It has been suggested elsewhere that some Athabascan languages might be pronominal argument and others might be null argument. Being clear about the way saturation happens in each of the hypotheses should be helpful in the effort to resolve these issues.

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⁶ Rice notes that in Slave, "Incorporated nouns are limited in terms of the verb themes that they can occur with. Many occur with all the classificatory themes, for example, but some occur with only a few of the classificatory themes (668)." Axelrod (1990) notes similar facts about Koyukon.

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