

# North East Linguistics Society

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Volume 27 *Proceedings of the North East  
Linguistic Society 27*

Article 23

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1997

## DP and Polysynthesis

Lynn Nichols  
*Harvard University*

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## DP and Polysynthesis

Lynn Nichols

Harvard University

### 1 Introduction

Polysynthetic languages are well known for their morphosyntactic complexity as well as particular structural properties, for example relatively free word order. It has been suggested by Baker (1996), an extensive investigation of this language type, that there is a general principle at work in shaping this characteristic polysynthetic structure. This general principle is the Morphological Visibility Condition (MVC), which, when operating in a language, in effect requires the formal, overt indexing of phrasal elements on thematic-role assigning heads. Of particular interest here is the suggestion that the MVC is responsible for the presence of noun incorporation (NI) in polysynthetic languages, movement of  $N^*$  to  $V^*$  being one way of formally carrying out this NP/V coindexing. Baker proposes that the presence of noun incorporation in a language is in fact diagnostic of the operation of the MVC and therefore of a general polysynthetic structure.

This study will examine the problematic case of a language with apparent noun incorporation but without any of the other structural properties commonly found along with noun incorporation in polysynthetic languages and which are similarly attributed, directly or indirectly, to the operation of the MVC. I will suggest that the difference between this language and polysynthetic languages stems from differences related to the Determiner Phrase (DP), in particular, to the presence of DP in the former vs. the absence of DP in polysynthetic languages. The investigation explores the possibility that the manner in which polysynthetic languages compensate for DP function is responsible for certain of the observed structural properties of polysynthetic languages. One result of this analysis will be a natural way to account for universal sensitivity to argument visibility, substituting the availability of various argument licensing strategies for the MVC and the polysynthesis parameter. The results of the investigation also suggest that the category DP is not a formal universal. Rather, it is the referential and argument licensing functions which are universal.

Finally, I will take a closer look at the problematic case of non-polysynthetic noun incorporation and suggest an alternative solution that better accords with the presence of DP in this language.

## 2 Some Structural Properties of Polysynthetic and Non-Polysynthetic Languages

### 2.1 Polysynthetic Languages

In various studies on the polysynthetic language type (e.g. Jelinek 1984, Allen et al. 1984, Baker 1996), certain structural properties have been observed to cluster in these languages, for example noun incorporation, free word order, rich agreement and the lack of a c-command asymmetry between subjects and objects. The most extensive study to date is Baker (1996), where it is claimed, based on an earlier proposal by Jelinek, that NPs in these languages appear in A' positions, and that from this follow some of the observed properties, e.g. free word order and the lack of subject/object asymmetry. The A' position of arguments as well as the high degree of morphosyntactic cross-indexing in polysynthetic languages are thought to follow from the MVC. The MVC, given in (1), requires that for an element to be visible for thematic role assignment by a head, that element must be visible to that head in a structurally defined way. The effect of the MVC is to require that an argument be coindexed on the verb via an agreement or movement relation.

One consequence of this is that the case to be assigned to the argument is taken up by the agreement morphology. The case filter will then require that the argument only appear in a manner that does not require case, therefore if that argument is to appear as a phonologically overt NP it must appear in a caseless (i.e. A') position.

#### (1) Morphological Visibility Condition (Baker 1966: 483)

A phrase Z is visible for  $\theta$ -role assignment from a head Y only if Z is coindexed with a morpheme Z' such that Z' is properly contained in an X\* node that is part of the word<sub>LF</sub> containing Y.

An X\* node properly contains Z if it contains Z and some other morpheme Y, such that Y is not contained in Z and Y is not a trace.

(2a-b) illustrate an example of polysynthetic noun incorporation and complex agreement from Northern Tiwa (data from Harrington and Roberts 1928).

#### (2) Picurís, Northern Tiwa

- a. 'ə-kal-wan-Ø                                    cf. kal-ene 'wolf'  
 3sg.dat./sg.abs.-wolf-arrive-perf.  
 'A wolf came to her'
- b. p'ak'uaxə-'e-ne                    ko-na-loie  
 spruce.cone-th.v.-pl.    1sg.erg./2sg.dat/pl.abs.-class4.agr.-drop-immed.fut.  
 'I am going to drop the spruce cones to you'

#### 2.2 Zuni

Now in Zuni<sup>1</sup>, there are structures that look like the noun incorporation characteristic of polysynthetic languages. (3b) illustrates this construction. As illustrated by (2a), in polysynthetic languages where nouns have inflectional suffixes, the noun

<sup>1</sup> An isolate spoken in western New Mexico.

suffixes disappear when the noun is incorporated. Similarly in Zuni, nouns drop their class/number inflectional suffixes when incorporated. Incorporation in Zuni is productive, in the sense that the noun can appear unincorporated and incorporated.

- (3) a. no-we' wo=k'ošo-k'ya  
bean-pl. pl.abs.-wash-past  
'He washed the beans'
- b. no-k'oso-kya  
bean-wash-past  
'He washed the beans'

Like incorporated arguments in polysynthetic languages, the incorporated noun in Zuni is referential and specific. These incorporated nouns can be referred to by pronominal forms,  $\emptyset$  anaphora or pronominal clitics and can have definite or specific reference, as illustrated in (4).<sup>2</sup>

- (4) a. to'-š pi(w)<sub>i</sub> -itok'ye-kkya  
2sg.nom.-Q pig-feed-past  
  
'e: ho' 'a:wan<sub>i</sub> ču-we' 'a:w=ito-k'ye-kkya  
yes 1.sg.nom to.them com-pl. pl.abs.-feed-past  
  
'Did you feed the pigs? Yes. I fed them some corn'
- b. Pilpo pi(w)<sub>i</sub> -itok'ya-ppa  $\emptyset$ <sub>i</sub> wapkwato-nap-kya  
Filbert pig-feed-diff.subj. sink-erg.pl.-past  
'Filbert fed some pigs and afterwards (they) [went to the river and] drowned.'
- c. pi(w)<sub>i</sub> -itok'ya-nan tap wo<sub>i</sub> =k'oso-nna  
pig-feed-same.subj. and abs.pl.=wash-future  
'he'll feed the pigs and then wash them

Another indication of the syntactic nature of this construction is the possibility of stranding certain elements, possessive pronouns for example.

- (5) yam ?e!ʔe-tiš-nap-kya  
reflx.poss. corpse-pick.up.pl.obj.-erg.pl.-past  
'They<sub>i</sub> got their<sub>i</sub> [children's] bodies'

Despite this apparently canonical noun incorporation, Zuni has some decidedly non-polysynthetic properties. While polysynthetic languages generally have free word order, Zuni has a basic SOV order. As (6a-d) show, leftward movement of objects has the effect of inducing a focused and/or specific interpretation of the object; with animate objects this movement is only possible if the object bears the accusative focus suffix -ya'.

<sup>2</sup> The (w) following the incorporated noun is epenthetic.

- (6) a. Pilpo 'ik'ošna-n 'aš-kya  
 Filbert toy-sg. make-past  
 'Filbert made a toy'
- b. 'ik'ošna-n Pilpo 'aš-kya  
 toy-sg. Filbert make-past  
 'Filbert made the toy'
- c. Ruth 'okya' 'ansattu-kya  
 R. girl help-past  
 'Ruth helped the girl'
- d. 'okya'-\*(ya) Ruth 'ansattu-kya  
 girl-acc/focus. R help-past (okya' Ruth 'ansattukya)  
 'Ruth helped the girl [not the boy]' 'The girl helped Ruth'

While polysynthetic languages have rich verbal agreement, Zuni has almost no agreement morphology on the verb as examples (6a-d) show. The exception is ergative plural agreement and an absolutive plural pronominal clitic, illustrated in (7), that is the same for all persons.

- (7) ton/hon/∅ ho'no'/to'no'/∅ 'a:w=ansattu-nan-kya  
 2pl.nom/1.pl.nom./3pl. 1pl.acc./2.pl.acc./3pl. pl.abs.=help-pl.erg.-past  
 'You.pl./We/They helped us/you.pl./them.'

Zuni also shows a subject/object asymmetry lacking in polysynthetic languages. The asymmetrical c-command of the object by the subject in Zuni is reflected in the binding properties of possessive constructions. There is a special anaphoric possessive form that is used when the possessor of the object is coreferent with a c-commanding subject. Where subject c-command of the object possessor is blocked, the non-anaphoric possessive form is used.

- (8) a. cawa<sub>k</sub> yam<sub>k</sub> kyakya šema-kya  
 boy Refl.POSS uncle call-past  
 'The boy<sub>k</sub> called his<sub>k</sub> uncle'
- b. cawa<sub>k</sub> ?an<sub>j</sub> kyakya šema-kya  
 1sg.nom. POSS uncle call-past  
 'The boy<sub>k</sub> called his<sub>j</sub>(\*<sub>k</sub>) uncle'
- c. [[šašik<sub>j</sub> ?an<sub>k</sub> waccita ?ito-kya-kowa? ] cawa<sub>k</sub> ?ansattu-kya]  
 man POSS dog cat-caus.-past.COMP boy help-past  
 'The boy<sub>k</sub> helped the man<sub>j</sub> who fed his<sub>k</sub>(\*<sub>j</sub>, m) dog.'

The structural properties<sup>3</sup> illustrated in (6)-(8) argue fairly convincingly that Zuni is not a polysynthetic language. The problem then is how to reconcile the fact that Zuni

<sup>3</sup> Another proposed characteristic feature of polysynthetic languages is the lack of non-finite verbal forms:

appears to allow noun incorporation, supposedly a sure sign of the operation of the MVC, with the fact that none of the other structures motivated by the MVC are present in Zuni.

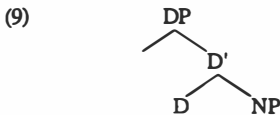
### 3 The DP Difference

The possibility of noun-incorporation in an otherwise non-polysynthetic language suggests that noun incorporation is not necessarily an indicator of the operation of the MVC and polysynthetic structure. What then is responsible for the differences between the two languages? I will suggest that the correlation between noun incorporation and polysynthetic properties still holds though for a different reason and that noun incorporation in Zuni is a special case.

The hypothesis I want to explore here is that the differences between Zuni (and configurational languages in general) and polysynthetic languages can be traced to differences with respect to the DP. Specifically, there is good evidence for a formal category DP in Zuni, while in polysynthetic languages there is little evidence for a structural DP. The presence vs. absence of DP I want to suggest is responsible for several of the observed structural properties in polysynthetic vs. non-polysynthetic language types.

#### 3.1 The Formal Presence of a DP

Szabolcsi (1984) argued that NP arguments are dominated by their own functional material. Abney (1987) suggests for this NP/functional category complex the structure shown in (9). Below I will treat the functional role of D and DP in greater detail; at this point I merely consider the evidence for and against the presence of such a structural category in the relevant languages.



##### 3.1.1 Evidence for DP in Zuni.

There are three different kinds of evidence for the presence of a syntactic category DP in Zuni. First, there is the lexical instantiation of the category D' as the determiners *lukkya* 'this', *lukno* 'these', *'ussi* 'that', *k'a'at* 'any'. These determiner elements pattern syntactically with other elements arguably of the category D', namely the 1st and 2nd person pronouns and the reflexive possessive pronoun. All elements of this class, including the determiners, undergo movement to the left edge of the clause. This is illustrated in (10a-e). Often the shifted determiners, like the similarly treated possessive pronouns, are dislocated from the rest of their constituent. Members of the category D shifted like this have default, not focused, interpretations and the shifted version is preferred in most cases to the in situ version.<sup>4</sup>

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non-finite forms are ordinarily found as incorporated into the matrix verb. Zuni has several types of inflected non-finite verbal forms and cannot syntactically incorporate V' into V'.

<sup>4</sup> The movement is apparently related to a universal constraint on the syntactic position of [+specific] elements that in Zuni must be accommodated at surface structure.

- (10) a. 'ussi<sub>i</sub> Pilpo t<sub>i</sub> k'yak<sup>o</sup>e-n 'aš-kya  
that Filbert house-sg. make-past  
'Filbert build that house'
- b. k'a' k'a'al<sub>i</sub> ho' t<sub>i</sub> picu:t 'itok'ya-nam-kya  
neg. any 1sg.nom. pig feed-neg.-past  
'I didn't feed any pigs'
- c. hom<sub>i</sub> lakky t<sub>i</sub> 'e'le' palo-'kya  
1.sg.poss. there girl be.buried-past  
'My daughter was buried there'
- d. hom<sub>i</sub> wacitt t<sub>i</sub> 'uttekyā  
1.sg.acc. dog bite-past  
'The dog bit me'
- e. yam<sub>i</sub> ho' t<sub>i</sub> taku-n 'okk'e-kkya  
reflex.poss. 1sg.nom. necklace-sg. lose-past  
'I lost my neclace'

A second candidate for membership in the class D is the suffix *-ya'*. This is suffix is found on transitive objects (and possessives) and functions something like a case marker<sup>5</sup>. It is optional on objects in situ but obligatory with leftward-focused objects and imparts definite and focus interpretation. That *-ya'* belongs to the syntactic category D is not only suggested by its semantics, it is also suggested by the fact that *-ya'* cannot co-occur with the determiner *'ussi*, shown in (12). Since *-ya'* is a suffix I assume N' raises and adjoins to D', in parallel fashion to the determiner-suffixed nouns found in Norwegian.

- (11) a. Ruth 'okya'(-ya') 'ansattuk-kya  
R. girl (-the, *focus*) help-past  
'Ruth helped a girl/the girl.'
- b. 'okya'-\*(ya') Ruth 'ansattu-kya ('okya' Ruth 'ansattukya)  
girl(-the, *focus*) R. help-past 'The girl helped Ruth'  
'Ruth helped the girl [not the boy]'
- (12) 'ussi 'okya' (\*-ya')  
that girl (-the, *focus*)

A third type of evidence for the DP in Zuni is the strict configurationality inside the argument phrase. While adjectives follow the head noun, determiners and quantifiers (also presumably D) must precede N'.

- (13) takun k'okši (\* k'okši takunne)  
necklace pretty

<sup>5</sup> Only with nouns having human reference.

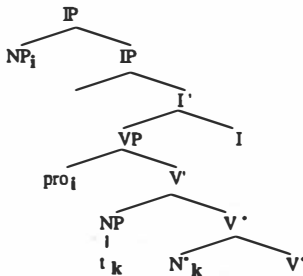
'ussi takunne that necklace	(* takunne 'ussi)
'emma taku:we many necklaces	(* taku:we 'emma)
hom ha'i cawaki my three son	(* ha'i hom cawaki)

Although Zuni does not have lexical instantiations of definite and indefinite operators, nevertheless I have shown that there are alternate sources of evidence for a syntactic category DP in Zuni.

### 3.1.2 Indications that DP is lacking in Polysynthetic languages.

The DP is assumed to be lacking in polysynthetic languages in at least one structural context by hypothesis, namely the position from which a noun undergoes incorporation into the verb. Baker (1996) argues that the observed optionality of incorporation vs. no incorporation of the noun in polysynthetic languages is epiphenomenal. He claims that movement of  $N'$  to  $V'$  is obligatory under certain structural conditions, namely when a bare NP argument occurs inside the VP in canonical A position. This proposal accounts nicely for both the syntactic properties of noun incorporation (e.g. possessor ascension) as well as those of the A'-adjoined NP argument.

(14)



One can also produce likely empirical evidence that polysynthetic languages probably lack DPs elsewhere. Baker points out that 'semantically significant' determiners are generally absent in polysynthetic languages. That is, these languages lack a class of elements belonging to syntactic category D, particularly with the semantics of an indefinite or definite operator, that select NP. Possible candidates for D such as the determiners 'this' and 'that' tend to have in these languages either the syntax of N or that of an adjectival modifier. An example is given in (15).

Baker suggests that a possible though perhaps degenerate candidate for D in polysynthetic languages is the noun inflectional suffixes that are found in several of these languages. Recall that these suffixes are absent when the noun is incorporated and thus accord with the notion that their absence results in a bare NP.



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## (15) Picurís (Northern Tiwa)

<u>kal-e-ne</u>	ʔa- <u>kal</u> -wan-ø
wolf-th.v.-sg.class1	3sg.dat./sg.abs.- <u>wolf</u> -arrive-perf.
	'A wolf came to her'

This analysis of the polysynthetic noun suffixes is problematic for at least a couple of reasons. Nouns bearing these suffixes can have both indefinite and definite interpretations; furthermore, when a noun incorporates and these suffixes disappear, both indefinite and definite interpretations are still available to the incorporated noun argument.

In addition, Zuni has similar noun suffixes that disappear during incorporation, illustrated in (16), but as indicated earlier, there is evidence that D is instantiated by a different set of lexical items in Zuni. Note in this light that while a determiner cannot co-occur with the focusing suffix *-ya*' since presumably both belong to the category D, a determiner can co-occur with these inflectional suffixes, (17b-c).

(16) sa-we                      wo=k'ošo-kya  
bowl-pl.class1. pl.abs.=wash-past

sa-k'ošo-kya

- (17) a. 'ussi 'okya' (\*-ya)  
that girl (-the, *focus*)
- b. 'ussi taku-nne  
that necklace-sg.class2
- c. 'ussi sa-'le  
that bowl-sg.class1

Furthermore, there is a correlation in Zuni between movement and specificity, yet the noun suffixes appear both on the in situ non-specific argument as well as the shifted specific argument.<sup>6</sup>

- (18) a. ho'                      taku-n                      'uk-kya  
1sg.nom. necklace-sg.class2 give-past  
'I gave him the necklace'
- b. 'ussi taku-n i                      ho'                      t<sub>i</sub>                      'uk-kya  
that necklace-sg.class2 1.sg.nom. give-past

In conclusion, though the evidence is not as strongly conclusive as one would like, nonetheless there is good reason for suggesting that polysynthetic languages lack the syntactic category DP. On the one hand the absence of DP seems to be motivated structurally, as in the case of noun incorporation, and on the other hand various possible candidates for D-hood don't seem to have the right syntactic or semantic properties.

<sup>6</sup> Though this may be going a bit deep into the grammar of a non-polysynthetic language to make claims about the properties of similar elements in polysynthetic languages, the point is that these kinds of structural diagnostics are unavailable in polysynthetic languages.

### 3.2 *Alternative Instantiations of DP in Polysynthetic Languages*

If, as I have suggested, polysynthetic languages do indeed lack DPs, this may have repercussions elsewhere in the structure of these languages. To understand how this might be the case, it is useful to take a look at the properties of DP.

One point of view, expressed in (Gil 1987), takes it that the presence of certain types of lexical elements signals the presence of DP in a language. According to this argument, the lexical instantiation of the indefinite/definite contrast is diagnostic of the presence of DP. A potential objection to this approach is suggested by cases like Zuni which presents several types of evidence for DP but yet does not rank a definite/indefinite contrast among these. Whether a language instantiates the indefinite/definite contrast may be no more than lexical accident, and does not necessarily imply a syntactic difference between Zuni and languages like English that do instantiate the contrast.

A deeper implication to this proposal is the assumption that while some languages have structural DPs, other languages in fact do not. Von Stechow (1994) argues, however, that there can be no such difference between languages; functional material like D(P) is obligatorily present in a language. The higher semantic types of functional categories, including D, are always necessary to compose the lower types such as Ns and Vs into sentences. Following Carlson (1983) von Stechow assumes that these functional meanings may be present even when not instantiated by a phonologically overt vocabulary item. While some languages appear to have a richer functional structure, this is simply because they have more than one lexical instantiation possible for a particular functional head.

We can be even more specific about the necessary functional role of the DP. Longobardi (1994) in a study of N to D movement in Germanic and Romance mentions two factors that might suggest the reason for the supposed obligatory presence of the DP cross-linguistically. Firstly, Longobardi notes that nominal elements that serve in some vocative, predicative or exclamatory function are bare NPs.

(19) Italian [Longobardi 1994]

- a. Tenente, esegua l'ordine!  
lieutenant, perform the command
- b. Gianni è tenente  
Gianni is lieutenant
- c. Maladetto tenente!  
damn' lieutenant

For a noun phrase to be licensed as a canonical argument, it must occur as a DP. Specifically,

(20) A "nominal expression" is an argument only if it is introduced by a category D.<sup>7</sup>  
(Longobardi 1994: 620)

The syntactic role Longobardi posits for the D head of the phrase suggests the reason for the argument licensing condition. In general D hosts an operator and N specifies the range (over kinds) for the operator variable. And it is through the D variable

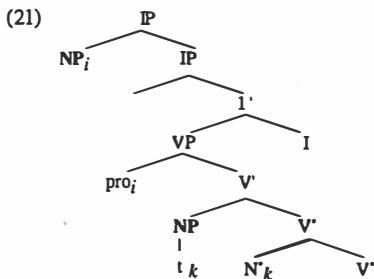
<sup>7</sup> This manner of stating the condition on argument licensing is intended to leave open the question of whether D is lexically instantiated or not.

that a nominal element is associated with a similar variable in a verb's logical argument structure.

The necessity of DP from both a semantic and syntactic viewpoint in licensing arguments must therefore be somehow reconciled with the apparent absence of DP in polysynthetic languages. I'll suggest that the function of DP is compensated for by other structural means of producing operators in these languages and therefore that certain structural properties characteristic of polysynthetic languages can be shown to derive from the lack of the type of DP as it is formally instantiated in other languages. Thus perhaps it is not the formal structure of DP that is universal, as von Stechow argues, rather it is the function, however formally brought about.

### 3.2.1 Noun Incorporation.

As for non-*pro* nominal arguments, there are two different structural contexts in polysynthetic languages to be considered.<sup>8</sup> Nominal arguments occur both unincorporated as well as incorporated. As I discussed earlier, Baker (1996) has made the elegant suggestion that these two options in fact correspond to two different structural positions, the first to NP adjoined to IP and the second to VP internal NP. It is from the latter position that noun incorporation occurs, from the bare NP in A-position inside the VP, and as such noun incorporation is obligatory.



Baker has proposed that the motivation for the obligatory incorporation of the N from the V complement position derives from the operation of the MVC. I would like to suggest the following alternative hypothesis. Recall von Stechow's observation that the function of the DP is essentially to compose lower (lexical) types into a clause structure. A bare NP, the source of noun incorporation, lacks the appropriate functional material yet an incorporated direct object, for example, nonetheless has the referential range as well as function of a freestanding DP direct object, i.e. incorporated arguments can serve as arguments in the Longobardi sense just as well as unincorporated arguments.

In other words, since DP is missing precisely in the case where noun incorporation occurs, noun incorporation itself must somehow serve the function that D and DP serve in endowing the nominal with referentiality and linking the nominal element to the argument structure of the verb. I suggest this is through the trace of the N,

<sup>8</sup> It should be understood that technically DP is not entirely absent in polysynthetic languages. NP arguments occur in A' positions and are coindexed with a phonologically null *pro* in argument positions inside the VP. According to UG principles governing pronominals, *pro* belongs to the category DP.

more specifically, from the properties of the variable deriving from incorporation movement.

In a study of Selayarese, Basri and Finer (1987) note that certain agreement facts indicate that regardless of the semantics of the moved lexical material (i.e. whether its reference is definite or indefinite), the trace of A' movement is definite.<sup>9</sup>

Verbs in Selayarese agree with both subject and definite object, as indicated in (22). Subject agreement is a prefix while object agreement is a suffix. When the object is indefinite, the verbal suffix agrees with the subject and the verb bears an "intransitivizer" prefix (a)ŋ/aʔ illustrated in (23).

- (22) a. ku-alle-i doeʔ-iNfo  
 1s-take-3 money-the  
 'I took the money'
- b. la-ʔalle-i doeʔ-iNfo i Basoʔ  
 3-take-3 money-they pers Baso  
 'Baso took the money'
- (23) a. (a)N-alle-kaN doeʔ  
 int-take-1pl money  
 'We took (some) money'
- b. (a)N-alle-i doeʔ i Basoʔ  
 int-take-3 money pers Baso  
 'Baso took (some) money'

Selayarese has both syntactic *Wh* movement as well as Topicalization of subject or object to a clause-initial position. Note that while *wh* in situ (in a multiple *wh* question) triggers indefinite object-type agreement, (24a), fronted *wh* triggers definite object-type agreement, (24b), modulo the absence of the object agreement head supposedly to allow proper government from A' position that the presence of the affix would otherwise block. Topicalization of the indefinite object has a similar result - the verb indicates a definite object-type agreement, (25a). It appears that the verb is indicating agreement with the trace left by A' movement of this object, and the nature of the agreement indicates that this trace has the property of definiteness.

- (24) a. inai ŋ-aro-i apa ri lamari  
 who int-put-3 what in cupboard  
 'Who put what in a cupboard'
- b. apa la-taro t ri lamari i Basoʔ  
 what 3-put in cupboard pers Baso  
 'What did Baso put in a cupboard?'

<sup>9</sup> Perhaps a more appropriate generalization from their data involves the specificity of the trace rather than its definiteness. As pointed out to me by Mark Baker (p.c.) the work of Irene Heimle has suggested that such traces are indefinite, but here too it may be specificity (whether indefinite or definite) that is being captured.

- (25) a. doe? la-alle t i Baso?  
 money 3-take pers Baso  
 'Baso took (some) money'
- cf.
- b. la-?alle-i doe?-iNfo i Baso?  
 3-take-3 money-the pers Baso  
 'Baso took the money'
- c. (a)N-alle-i doe? i Baso?  
int-take-3 money pers Baso  
 'Baso took (some) money'

In other words, the variable resulting from movement appears to have properties similar to a D head.

It is possible to view in a parallel light the A' movement of noun incorporation, so that likewise the A' trace resulting from noun incorporation is a variable of sorts<sup>10</sup> with similar D-like properties. As such this variable provides a function for the incorporated argument similar to that provided by D to DP arguments in other languages. That is, the trace of A' movement acts as the necessary referential variable (operator).

In summary, since the syntactic category D(P) is absent in polysynthetic languages (except for its UG instantiation as *pro*), the function of D necessary for argument licensing is instantiated in another way. Specifically, N' must move to an A' position to create the necessary operator variable. Options for this N' movement are constrained by the Head Movement Constraint (Travis 1984) and minimality considerations (Chomsky 1993); consequently the noun head-adjoins to the verb and the result is noun incorporation.

### 3.3. Implications for the Universality of Functional Categories

The hypothesis described here for the correlation between certain aspects of polysynthetic structure and DP function has particular implications for the claim that functional categories are universal. The proposal here concerning polysynthetic languages is different from simply saying that D' is present but not lexically instantiated, as Longobardi claims and as one might claim for a language like Vietnamese. Rather, the functional head D is completely absent from the polysynthetic syntactic inventory. Nonetheless, as I have argued, the referential and licensing properties of D and DP are instantiated in an alternative way, suggesting that it is not the formal category that is universal but rather its function.<sup>11</sup>

### 3.4 Warlpiri and Type Shifting

Potential support for this hypothesis of the non-universality of syntactic DP might be found in Warlpiri. According to Bittner and Hale (1995), Warlpiri lacks elements of the syntactic category D and therefore lacks a structural DP. The category of nominal

<sup>10</sup> One might question the validity of grouping together the A' traces of XP movement and X' movement. A possible line of defense at least in the present case is that it is the direct projection of N', namely NP, that is in A-position in incorporation contexts (i.e. NP is not dominated by another category XP (=DP) that could be considered as actually occupying A-position). So that N' before movement is as close as an X' can come to occupying A-position.

<sup>11</sup> It is not clear whether this proposal should be extended to all functional projections.

elements in Warlpiri includes quantifiers and demonstratives as well as adjectives, common nouns and proper names.<sup>12</sup> Indefinite and definite readings of nominals are the result of the interaction of their basic meanings with type shifting operations. A type shifting operator can be applied to all members of this class, even the quantifiers and demonstratives, cf. examples (27) - (29). I would suggest, following Hale and Bittner, that in the absence of the DP, the Warlpiri arguments are licensed through the type shifting mechanism from which their referential properties derive.

- (27) kurdu ka-ma-Ø nya-nyi  
 child<sub>i</sub> PRS-1s-3s<sub>i</sub> see-NPST
- (i) I see a child. [weak]  
 (ii) I see the child. [strong]  
 (iii) I see him/her<sub>i</sub>, who<sub>i</sub> is a child. [predicative]

The type-shifting analysis of Warlpiri supports the correlation between presence vs. absence of structural DP and word order type in an interesting way. While Warlpiri is not a polysynthetic language, Warlpiri lacks a structural DP and (consequently, I would suggest) has quite free word order, according to Hale 1983, Jelinek 1984, Bittner and Hale 1995. In contrast, languages which do have a structural DP do not have free word order, following from the fact that the presence of DP licenses the arguments to appear inside the VP.

Warlpiri also lacks noun incorporation, suggesting a second more tentative hypothesis that where type shifting is used to license arguments, noun incorporation is not necessary and therefore not possible (following Baker's view that incorporation is obligatory). Potential support for the type-shifting/no noun incorporation correlation comes from the proposal of Chierchia (1996) that bare NPs in certain Indo-European languages are licensed by type shifting. The absence of productive syntactic noun incorporation in these languages is well known.

A final and most tentative hypothesis of all is therefore that type shifting is not available in polysynthetic languages as an argument licensing mechanism, contra standard assumptions of its universal availability.

#### 4. Noun Incorporation in a Language with DP?

The absence of a DP functional category containing the NP has been suggested to be responsible for the occurrence of noun incorporation as well as the referential properties noun incorporation. Similarly, from the presence of DP functional structure follow the properties usually found in non-polysynthetic languages such as strict word order, a subject /object asymmetry, and the lack of NI. DP functional material licenses the NP in canonical argument position inside the VP, and therefore there is no need for alternative strategies for licensing NP arguments.

This leaves unexplained the apparent possibility of noun incorporation in Zuni, as illustrated earlier in example (3), repeated here.

<sup>12</sup> They show their unity as a class in heading their own autonomous phrases, do not have a fixed position within the NP, and can appear in construction with other nouns in apposition and secondary predication.

## (3) Zuni

- a. no-we' wo=k'ošo-k'ya  
bean-pl. pl.abs.-wash-past  
'He washed the beans'
- b. no-k'oso-kya  
bean-wash-past  
'He washed the beans'

Noun incorporation is supposed to take place from bare NPs, yet in Zuni there is evidence of DP functional structure. This state of affairs could perhaps be the result of the special nature of DP in Zuni such that DP can be absent under certain prescribed conditions related to contextual and discourse factors. The results of recent fieldwork suggest a more likely resolution of the dilemma. The incorporation of nominal elements in Zuni illustrated in (3) appears to be something more like determiner (D) incorporation or perhaps D cliticization. Several types of evidence point to this conclusion, both phonological and distributional.

Consider the following. (i) Incorporated forms are nearly always phonologically reduced forms of the noun. It was mentioned earlier that nouns occurring with a class/number suffix<sup>13</sup> drop this suffix when incorporated into the verbal complex. This is illustrated in (3b). Though at first glance the behavior of this inflection appears to parallel that of similar suffixes in polysynthetic languages, the implications are different. The dropping of the Zuni suffix results in a monosyllabic form for incorporation. And although there is a class of polysyllabic noun stems that bear inflectional suffixes, these nouns rarely (if at all) incorporate. The one exception that I know of is *wi'činne* 'neck', whose incorporated form is in fact the (unpredictably) reduced *wiš-*. It appears that the ability to incorporate is related to the prosodic weight of the noun stem. It is rarer for uninflected nouns with animate reference to incorporate, yet a few nouns of this type are found to do so. While their unincorporated forms are polysyllabic, in their incorporated forms they are reduced to first syllable of the stem.

- (28) paču            pa-            'Navaho person'  
picu:ti           pi-            'pig'

(ii) The incorporated noun is in complementary distribution with the absolutive plural pronominal clitic.<sup>14</sup> Furthermore, like the absolutive clitic, the incorporated noun always has plural reference.<sup>15</sup>

<sup>13</sup> For the most part, inflected nouns are inanimate and uninflected animate.

<sup>14</sup> Baker (1988) describes a low level parametric variation for polysynthetic languages in which verbal agreement affixes are present (e.g. Southern Tiwa) or absent (e.g. Greenlandic Eskimo) in the presence of noun incorporation. A similar low-level treatment is of course unavailable to us in the present case since not only is Zuni not polysynthetic, the absolutive plural morphology is not an agreement affix but rather a clitic.

<sup>15</sup> The referential properties of incorporated nouns in present day Zuni may differ from those indicated in texts collected in the earlier part of the century. From these texts it appears that the incorporated noun may have allowed singular reference, though this is not certain. There are certain idiomatic and fixed forms in the modern language, where the incorporated noun always has singular reference, e.g. *ča-(w)-aša* *child-make* 'give birth to a child/\*children'; *pa-k'ošo* *Navaho-wash* 'wash (ceremonially) a Navaho /\*Navahos'

- (29) a. ho' picu:ti 'a:(w)=ito-k'e-kkya  
 lsg.nom. pig pl.abs.=eat-caus.-past  
 'I fed the pigs/\*pig'
- b. ho' pi(w)-ito-k'e-kkya  
 lsg.nom. pig-eat-caus.-past  
 'I fed the pigs/\*pig'

The incorporated noun cannot be doubled by a (plural) element of the syntactic class N, (30) (sometimes found with NI in polysynthetic languages), while it can be doubled by an element of the syntactic class D, that is, a determiner or a proper name, (31a-b). Note the incorporated noun cannot double a singular D, (33c-d).

- (30) \*ho' pic'ana-: pi(w)-ito-k'e-kkya  
 lsg..nom. piglet-pl. pig-eat-caus.-past  
 'I pigs-fed the piglets'
- (31) a. ho' lukno pi(w)-ito-k'e-kkya  
 I.nom. these pig-eat-caus.-past  
 'I pigs-fed these (ones)/them'<sup>16</sup>
- b. ho' Robin, Chris, tap Gabe pi(w)-ito-k'e-kkya  
 lsg.nom. R. C. and G. pig-eat-caus.-past  
 'I pigs-fed Robin Chris and Gabe'<sup>17</sup>
- c. \* ho' Robin pi(w)-ito-k'e-kkya  
 lsg.nom. R. pig-eat-caus.-past  
 'I pigs-fed Robin'
- d. \* ho' 'ussi pi(w)-ito-k'e-kkya  
 I.nom. that pig-eat-caus.-past  
 'I pigs-fed that (one)/him'

The phonological and distributional evidence together suggest that the incorporation of a somewhat abbreviated form of the noun into the Zuni verbal complex is an example of D cliticization.<sup>18</sup> Though the phenomenon perhaps resembles a system of syntactic classifiers, it diverges in its referential and anaphoric properties and in not allowing the doubling normally associated with classifiers.

## 5. Some Conclusions

This investigation has suggested some tentative hypotheses concerning the universality of functional categories. Specifically, the formal category DP may not be universal, but DP referential and argument licensing functions are. The absence of DP in polysynthetic languages is compensated for structurally by alternative instantiations of licensing configurations (or by type shifting in other languages). And finally, it is suggested that languages with DP cannot have true N incorporation (unless perhaps special conditions not yet understood allow absence of DP in certain contexts).

<sup>16</sup> The plural proximal demonstrative *lukno* is ordinarily reserved for humans. Its use here imparts the connotation that the pigs are considered dear to the family, i.e. are special pets.

<sup>17</sup> Distinguishes the pigs from the nieces and nephew after whom the pigs were named.

<sup>18</sup> Compare a similar phenomenon in Piranha (Everett 1996).



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Dept. of Linguistics  
 Harvard University  
 Cambridge, MA 02138  
 nichols@fas.harvard.edu