# A DISCUSSION OF ROSEN'S (1989) LEXICAL ANALYSIS OF NOUN INCORPORATION

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## Introduction

In her paper, "Two Types of Noun Incorporation: A Lexical Analysis," Sara Thomas Rosen presents an account of noun incorporation (hereafter NI), which is the result of word formation rules in the lexicon, rather than the result of a syntactic process. Her claim is that languages may choose one of two rules which produce noun incorporation and that each rule will have a different set of grammatical properties associated with it. One rule will produce "Classifier NI". When the object is incorporated into the verb, an argument of the verb is not satisfied, and so the verb's transitivity is unaffected. Languages of this type display "doubling" and "stranding". Northern Iroquoian, Caddo, and Rembarnga languages are among those with Classifier NI (Rosen, 1989, p. 296).

The other rule will produce "Compound NI". When the complex verb is formed, one argument of the simple verb is satisfied within the complex verb, and the verb itself becomes intransitive. Polynesian and Micronesian languages are among those with compound NI (Ibid.).

Rosen's goal is to show that a lexical theory, which distinguishes the two types of NI, will predict the grammatical properties associated with these languages, while a syntactic approach to NI will not.

## Classifier Noun Incorporation

Classifier NI is so named because the incorporated noun acts like a classifier in that the object noun phrase must be, at least as specific or more so than the incorporated noun. For example, one could say 'I fish-caught a trout' but not ' I trout-caught a fish'. There are three main grammatical properties associated with this type of NI. They are:

1. Stranding of modifiers.
2. Argument structure of the verb is unaffected.
3. Doubling of objects.

In addition, Rosen notes that all classifier incorporating languages allow pro-drop in all positions.

Stranding occurs when a direct object NP is partly null, and the stranded element modifies the null head of that NP. While incorporated nouns can be related to NPs with modifiers but no head noun, stranding is said to be independent of the incorporation process. Rosen attributes stranding to the existence of null-head modifiers but states that NI and null pro-forms are bound to interact, which is what the data shows (p. 298). Three examples, which show the independence of stranding and the existence of null-head modifiers, are given. Example (5) from Mohawk shows that stranded modifiers are possible with or without an incorporated noun. In addition, the adjective "dotted" shows gender agreement with the null head, with or without incorporation, and so provides further support for this position (p. 299).

(5) Mohawk
    a. *Kanekwarúnyu waʔ -k-akyaʔ tawiʔ tsher-ú:ni.*
       3N.dotted.DIST    PAST-1sg.3N-dress-make
       'I made a polka-dotted dress.'

    b. *Kanekwarúnyu waʔ katkáhtho.*
       3N.dotted.DIST    PAST-1sg-3N.see
        'I saw a dotted (one).'

Examples (6) and (7) from Caddo show that demonstratives and quantifiers may be stranded with or without incorporation (Ibid.)

(6) Caddo
    a. *ná: kan-núh- ʔ aʔ .*
       that water-run.out-will
       'That water will run out.'

    b. *ná:ʔ iyúh ʔ aʔ .*
       that run.out.will
       'That will run out'

(7) Caddo
    a. *wayah hak-kʔ uht-ʔ iʔ -sa ʔ .*
       a.lot  PROG-grass-be.grow-PROG
       'There is a lot of grass.'

    b. *wayah háh-ʔ iʔ -sa ʔ .*
       a.lot  PROG-be.grow-PROG
       'There is a lot.'

Examples (8) and (9) from Tuscarora and Seneca show that modifier stranding also occurs in NPs not usually associated with NI (p. 300).

(8) Tuscarora
    a. *...kye:ni:kv: haʔ kyeʔ ra-kwatihs Ø yah-wa-hra-kwaʔ n-*
       thi        that that    M-you   Ø TRS-AOR-M-side-

      *aΘe:- ʔ*        *kyeʔ Ø-hr-eʔ*        *ra-kwatihs*    *Ø*
      encircle-PUNC   that REP-M-go        M-young     Ø
      'This young (man) who had gone around the other side, came back again as a
      young (man).'

Languages with Classifier NI are predicted to have no change in transitivity of the verb after incorporation, because the incorporated noun does not satisfy an argument of the verb. After NI occurs, transitive verbs remain transitive and intransitive verbs remain intransitive. This is demonstrated by the transitive agreement prefixes which remain on the verbs after incorporation. In example (13) from Seneca, the agreement prefix *shako-* , which indicates agreement with a third person masculine subject and a third person feminine object, remains after incorporation (p. 301-302).

(13) Seneca
    a. *Ta:h o:neh nä:h*          *kyōʔō h*          *daʔ -a-shako-kē- ʔ*
        and now  CONTRASTIVE     QUOTATIVE  NEG-AOR-3M.3.F-see-PUNC

        *katkaʔ hoh,*    *ne:ʔ*     *kyōʔ ōh*     *kē:s*    *nekēʔ*  *neh ye-ks-a a-:h*
        anywhere      ASSN   QUOTATIVE  repeatedly  this     the  F-child-small-STAT
        'And he didn't find the girl anywhere.'

Although transitivity is unaffected, incorporated nouns in Classifier NI do place a selectional restriction on the verb. The object NP must belong to the class of objects described by the incorporated noun root and must be at least as specific as the incorporated noun (p. 297).

The third grammatical property characteristic of Classifier NI is that of doubling. An incorporated noun on the verb is repeated or doubled in the DO position in order to satisfy the argument structure of the transitive verb (p. 302). While the morphological form of the doubled noun need not be the same as the incorporated noun, it is required to meet the selectional restrictions of the incorporated noun. In example (15) from Mohawk, *rabahbot* 'bullhead' is a type of *tsy* 'fish' (p. 303). Tuscarora, Caddo and Rembarnga exhibit doubling in a similar way.

(15) Mohawk
    a. *Tohka*    *niyohserá:ke*     *tsi naheʔ*  *shaʔ té:ku*  *nikú:ti*     *rabahbót*
        several  so.it.year.numbers  so.it.goes   eight       of.them     bullhead

        *wahu-tsy-ahni:nu*       *ki  rakeʔ niha*
        3M.3N-fish-bought  this  my-father
        'Several years ago, my father bought eight bullheads.'

Rosen concludes her discussion of Classifier NI with observations of Southern Tiwa and West Greenlandic Eskimo. She finds that Southern Tiwa is similar to other Classifier NI languages because NI doesn't affect the transitivity of the verb and stranding occurs. West Greenlandic also allows stranding, but the issue of transitivity is uncertain. When incorporation occurs, the verb is always intransitive and stranded elements are marked with instrumental case. One possible explanation is that only definite objects receive agreement on the verb and that all indefinite objects appear in instrumental case. Rosen surmises that definiteness, not incorporation, affects transitivity (p. 304-305).

Southern Tiwa and West Greenlandic Eskimo differ from other Classifier NI languages in that they do not allow doubling. One explanation may be that doubling is not allowed because of selectional restrictions that the incorporated noun places on the verb (p. 307). Rosen speculates that the head of the DO NP may not be permitted to duplicate information in the incorporated noun and, as a result, doubling would be forbidden. In other Classifier NI languages, the incorporated noun has few noun-like features and is more compatible with fully specified NP Direct Objects (Ibid.). By contrast in Southern Tiwa and West Greenlandic, incorporated nouns are fully specified for noun head features. Duplication of these features may not be permitted, thus attributing the lack of doubling to a process independent of NI.

Despite the lack of doubling, Rosen maintains that the lexical account of NI for these two languages is still correct. Her proof is in the existence of null-head modifiers which occur independently of NI, as shown in example (27a) from West Greenlandic in which the noun root for 'dog' is incorporated and the modifier 'big' appears with a null head, and in example (27b) in which the null-headed modifier 'big' is in object position with a null NP head and no noun root in the verb. (p. 308).

(27) West Greenlandic
    a. *Angisuumik    qimmeqarpoq*
       big.NM.INST.    dog.have.INDIC.3sg
       'He has a big dog.'

    b. *Angisuumik    unataavoq.*
       big.NM.INST.    beat.APASS.INDIC.3sg
       'He beat a big one.'

Similarly, in Southern Tiwa, numerals and demonstratives can stand alone without a head noun, even when a noun is not incorporated into the verb.

(28) Southern Tiwa
    a. *Yede  a-mū-ban.*
       that   2s.A-see-PAST
       'You saw that.'

    b. *Wisi  bi-mū-ban.*
       two   1s.B-see-PAST
       'I saw two.'

The stranding facts together with the independent existence of null-head modifiers seems to be enough to justify a lexical account of NI. Rosen concludes that lack of doubling is due to some other factor independent of NI, which is not addressed in this paper (p. 308).

Rosen speculates that a different type of NI occurs in these languages. If this is so, then such a theory would have to explain lack of effect on the transitivity of the verb, stranding, lack of doubling, and existing selectional restrictions on the verb. These grammatical properties would have to be predicted whether the theory is syntactic or lexical.

**Compound Noun Incorporation**

Compound NI is a process similar to compounding in English where the DO argument of the verb is satisfied, preventing the co-occurrence of a DO with NI (p. 309). When the complex verb is formed, it is intransitive and no stranding or doubling takes place. Some Polynesian and Micronesian languages allow this type of NI.

Case marking in the Polynesian languages provides evidence for the intransitivity which results from NI. In Samoan and Niuean, which have ergative case marking, Rosen finds that after NI, the subjects are marked absolutive, which indicates that the verb is intransitive (p. 310).

Stranding of determiners or modifiers is not expected in languages with Compound NI, since object arguments are not expressed outside the verb. From the examples given in (35) and (36), modification of the incorporated noun is not possible, and thus prohibits stranding as well (p. 311-312).

(35) Kusaiean
    a. *El twem-lah    mitmit sahfiht    sac.*
       He sharpen-PAST   knife dull    the
       'He has sharpened the dull knife.'

b. *El   twetwe        mitmit-lac.*
   He   sharpen      knife-PAST
   'He has knife-sharpened.'

c. * *Nga   twetwe    mitmit   sac.*
    I     sharpen   knife    the
     'I knife-sharpen the 0.'

d. **Nga twetwe       mitmit sahfiht sac.*
    I     sharpen     knife   dull   the
     'I knife-sharpen the dull 0'

(36) Ponapean
   a. *I pahn perek-I     loh-o.*
      I will unroll-TRANS  mat-that
      'I will unroll that mat.'

   b. **I pahn perek-0-los-o*
      I will   unroll-INTR-mat-that
      'I will unroll that mat.'

As with stranding, doubling also requires an argument outside the verb. Since the complex verb formed by Compound NI has no object argument, doubling is not expected in languages with this type of NI. As predicted, doubling does not occur in Polynesian and Micronesian languages (p. 312).

## Syntactic Accounts of Noun Incorporation

Having stated her case for a lexical account of NI, Rosen turns to a discussion of two syntactic accounts of NI. Baker's 1988 movement account describes NI as a process where the head of the DO NP moves from object position into the verb. A trace is left behind in the DO NP. Modifiers and determiners are left behind in the DO NP, which would account for stranding (p. 313). This means that transitivity will be unaffected, and the verb will remain transitive. According to Rosen, this presents two problems for Compound NI languages. It will not predict the intransitive verbs found in these languages, and it will not predict the lack of stranding (p. 313-314).

Rosen also discusses Sadock's 1985 autolexical account of NI which states that morphology and syntax have independent representations that meet at the word level. Morphology has one representation combining the verb and incorporated noun in a single word, and syntax has a different representation with the noun in object position. Morpheme order in the sentence is determined morphologically, so that if a noun root occurs within the verb the sentence will surface with NI (p. 313). This account also allows for compounding as an NI process and therefore treats Compound NI in the same way that Rosen does.

However, Classifier NI languages present a problem for this theory. Rosen explains that there would have to be a condition such that transitivity would be determined by the syntactic representation, not the morphological representation, so that there would be no transitivity change between NI sentences and non-NI sentences. There is no reason that a grammatical property such as transitivity should be determined syntactically. In a lexical account, however, such properties occur as a natural result of NI process (p. 314).

Rosen also finds that neither syntactic account is able to explain two properties of Classifier NI languages; the independent existence of null-head modifiers and the existence of doubling.

One unresolved issue is how to classify what can and cannot incorporate (p. 315). Both types of NI show that it is usually direct objects and only subjects of unaccusative verbs that may incorporate. A syntactic theory is able to explain this asymmetry between subjects and objects. If the verb governs the DO position, then the incorporated noun stem governs its trace, which satisfies the "Empty Category Principle" (p. 315). A lexical account is unable to explain this asymmetry. Rosen suggests other distinctions, such as "subject/non-subject" or "external/internal arguments", as a basis for classification. One fact that any theory will have to explain is that goals and benefactives never incorporate in any language (p. 316).

Finally, Rosen points out that a by-product of her lexical theory is the potential occurrence of four different NI language types based upon the interaction between the two NI rules and the independent existence of null pro-forms. This means that both Compound NI and Classifier NI may occur with or without null pro-forms (p. 316).

## Critique

In this paper, Rosen has provided for two types of NI which are the result of word formation rules. Classifier NI results in selectional restrictions being placed on the verb while Compound NI results in argument satisfaction. Her theory also shows that stranding facts are the result of the existence of null arguments and of null NP heads, rather than the process of NI. For many languages, this theory correctly predicts the groupings of grammatical properties that occur.

However, there are three questions that her theory has not been able to clearly explain:

1. Why does Southern Tiwa not pattern like Classifier NI languages and allow doubling?
2. How can the lack of doubling and change of transitivity be explained in West Greenlandic?
3. Is there a way to explain what can and cannot incorporate?

Some solutions to the lack of doubling in Southern Tiwa are discussed. The most promising is that it is possible that the incorporated noun may be fully specified for noun head features. In this case, there may be a selectional restriction that forbids duplication of this sort of information and that doubling may only occur when the features of the head are not so completely specified as they are on the verb (p. 307). There does seem to be a range in the selectional restrictions cross-linguistically. In Rembarnga, the direct object may provide information identical to the incorporated noun. Example (18) illustrates this with "paperbark" repeated as the direct object and incorporated noun. In Iroquoian and Caddoan, the selectional restrictions are more precise and they require that the independent NP be more specific than the incorporated noun (p. 303).

Such selectional restrictions are also seen in languages with Compound NI. In South Slavey (Saxon, 1996a), *"chi"* provides more specific information about the object and may therefore may be incorporated:

(31)    *Nachizheluh*
        chi=stick/stem    zhe=3rd person S & DO
        'He is letting it (a wooden object) hang down'

It is reasonable to say that selectional restrictions may be responsible for the lack of doubling at least in Southern Tiwa. The fact that Tiwa clearly patterns with other Classifier NI languages with respect to stranding and transitivity, plus the independent existence of NI and null-head modifiers, lead me to conclude that Rosen's analysis of Southern Tiwa as a Classifier NI language is essentially sound.

The problems with West Greenlandic Eskimo are more complicated than with Southern Tiwa. It is possible that West Greenlandic may be a language that does not have NI. If so, then stranding and the occurrence of nouns within a complex verb will need to be explained.

Rosen has proven that the existence of null-head modifiers is independent of the incorporation process. In Mohawk, adjectives may be stranded independently of incorporation, and so may demonstratives and quantifiers in Caddo. Null-head modifiers may also be responsible for the stranding facts in West Greenlandic. This would explain the existence of the stranded adjective and the instrumental agreement marker in (27) from Sadock (1980):

(26) *Sapanngamik kusanartumik       pisivoq*
    bead - INST. beautiful-NOM.-INST.  thing-get-INDIC.-3s

(27) *Kusanartumik         sapangarsivoq*
    beautiful-NOM.-INST.  bead-get-INDIC.-3sg.
      ' He bought a beautiful bead.'

Example (28) from Sadock (1980) shows the relationship between the stranded element and the noun within the complex verb, indicated by the plural agreement on the modifier:

(28) *Kusanartunik              sapangarsivoq*
    beautiful-NOM.-PL.-INST. bead-get-INDIC.-3sg.
      'He bought beautiful beads.'

Examples (32) and (33) from Sadock shows an instance of a stranded possessor of the noun within the complex verb:

(32) *Tuttup       neqaanik       nerivunga*
    reindeer-REL.  meat-3sg.-INST.  eat-INDIC.-1sg.

(33) *Tuttup       neqitorpunga*
    reindeer-REL.  meat-eat-INDIC.-1sg.
      ' I ate reindeer meat.'

If we say that null-head modifiers do exist in West Greenlandic and that they do not need to be connected to NI, then there is a plausible explanation for the instances of stranded modifiers and possessors which also show agreement with the noun contained in the complex verb.

The occurrence of nouns within the complex verb is not necessarily a case for NI in West Greenlandic. As Rosen points out, the process in this language is not like NI in the other languages that she discusses (p. 304). In other NI languages, a verb without its incorporated noun remains a well formed verb (Mithun,p. 32). In West Greenlandic, incorporation only applies obligatorily to a restricted set of affixes, since all verbs select whether they take noun roots. These verbs are more like affixes, since they may not stand alone without a noun (p. 304). Since this process is so different from that in NI languages, it is possible that this is a case of denominal verb formation, as suggested by Mithun (1986). This would explain the occurrence of nouns within a complex verb.

The final problem concerns what may or may not incorporate. We see variance across languages both in terms of what entities may incorporate and how they are classified by researchers who study these languages. This is illustrated by the following examples of entities which may incorporate:

Chukchee (Polinksy, p.361-363)

|  | {Intransitive Subject |
| Initial Absolutives | {Direct Object |
|  | {Initial DO and final Subject of |
|  | {unaccusative |
|  | { Initial/final Subject of unergative |

Koyukan (Axelrod, p. 183-4)

Nouns -Inanimate noun stems   { as subject, object, or
  { adverbial expression of
    -areal nouns    { manner, location, or instrument

    -body part terms  { as object or adverbial
Adjectives

Dogrib (Saxon, 1996b)Verbs of expression, body parts, features in the natural world,
and other unspecified nouns.

In addition to these examples there is attested incorporation of themes, instrumentals, means phrases, and locatives in other NI languages (p. 315). It is difficult to find a common thread in the data. One possibility that Rosen points out is that there is a distinction between external arguments, which never incorporate, and internal arguments, which seem to freely incorporate.      This still does not explain why goals and benefactives never incorporate (p. 316).

Another possibility is that the criteria for deciding what may or may not incorporate is decided at a different level of the grammar. It may be that such criteria are a matter of selectional restrictions of the verb. Using Jackendoff's model of the grammar,  selectional restrictions "are constructed out of a subvocabulary of conceptual structures." (Jackendoff 1987, p. 385). Lexical primitives and rules in conceptual structure would determine the selectional restrictions such that only certain entities would be allowed to undergo incorporation with certain verbs. The action of a particular verb may only be compatible with certain entities.

There may also be another factor that affects the choice of what may incorporate, or when incorporation is permitted. Discourse context may be relevant to the incorporation process (Mithun, p. 35). Examples (1) a. and (1) b. from Mithun show that in Tewa, a sister language to Southern Tiwa, new topics are introduced by nouns appearing outside of the verb with incorporation of that noun occurring in the discourse that follows. Since most examples in the literature are isolated sentences taken out of context, more data within a discourse context would be needed to formulate a theory.

Rosen's lexical analysis is a thorough and logical explanation of the process of Noun Incorporation. While it is applicable to a number of languages, it remains challenged by languages such as Southern Tiwa and West Greenandic Eskimo, which do not follow the prototypical pattern, and by difficulties in determining what may or may not be incorporated.

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