

**ANALYTIC NOUN INCORPORATION  
IN  
CHUJ AND K'ICHEE' MAYAN**

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## Abstract

In this paper, the noun incorporation (NI) construction in Chuj and K'ichee' Mayan is examined. Formal explanations are proposed using the non-projecting semantic argument (NPSA) within the Lexical Functional Grammar (LFG) architecture. Derivational morphology indicates that NI is an analytical construct, and by inference, is post-lexically formed. Traditional NI semantic analyses, although productive, fall short of a full accounting. Consequently I show that the incorporated noun (INCORPORATE) represents a hybrid category of grammatical function (GF) that displays a mix of properties acquired from prototypical subcategorized GFs and non-subcategorized ADJUNCTS.

## 1 Introduction

In this paper, I examine the noun incorporation (NI) construction in Chuj and K'ichee' Mayan.<sup>1</sup> Of particular interest in Chuj is the NI construction's striking dialectical variation, and its variety of stranded modifiers unknown in other Mayan languages. In K'ichee's NI construction, an apparent anomaly exists in that the incorporated noun can control verb agreement in an otherwise standard intransitive predicate.

This paper addresses two issues. The first concerns the NI construction's morphosyntax. Traditionally two fundamentally opposing approaches have been pursued based on the following assumptions. Is NI a morpholexical construct (Di Sciullo and Williams 1987; Mithun 1984), a syntactic construct (Baker 1988; Sadock 1986), or is it both (Ball 2005; Van Geenhoven 1998a)? It is apparent that the two opposing approaches are overly reliant on theory-internal assumptions, and ultimately, remain artifacts of a syntactic-semantic isomorphism. In addition, Van Geenhoven's (1998) semantic incorporation, although productive, is a strictly semantic account,

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<sup>1</sup> Chuj is spoken in the towns of San Sebastián Coatán, Nentón, and San Mateo Ixtatán all located in Guatemala's Cuchumatán mountains (Hopkins (1967:Intro.); Maxwell (1976:Fn.1); Williams and Williams (1966:219)). The Unified Mayan Alphabet (UMA), as adopted by the Academy of Mayan Languages of Guatemala, is used in this paper and not IPA symbols. Unless otherwise indicated, the K'ichee' data are from the author's field work. Note the following abbreviations: first, second, third person = 1, 2, 3, absolutive agreement marker = ABS, actor focus = AF, (absolutive) antipassive = AP, clitic = CL, completive = COM, derived transitive verb = DT, determiner = DET, ergative agreement marker = ERG, genitive = GEN, incompletive aspect = INC, independent pronoun = INDPRO, intransitive = INTR, interrogative = INT, irrealis = IRR, negative = NEG, nominalizing suffix = NOM, noun-incorporation = NI, passive = PAS, transitive/intransitive phrase final marker = T/IPF, plural = PL, preposition = P, relational noun (phrase) = RN(P), singular = S, lexical stem forming vowel = SFV, transitive = TRA.

and fails to adequately explain NI's unique morphosyntax. My discussion moves away from the prototypical approaches, due, in some part, to the availability of more fine-grained semantic analyses, LFG's monostratal architecture (Kaplan and Bresnan 1982), and the atomicity of lexical integrity (Bresnan and Mchombo 1995).

The second issue concerns the incorporated noun's representation and the complex cluster of morphosyntactic and semantic properties associated with it. The incorporated noun's representation includes its syntactic structure, agreement behavior, scopal properties, and semantic expression and composition. Van Geenhoven's (1998) semantic incorporation is a promising point of departure for a truth-conditional analysis of NI. I argue, however, that to adequately account for all types of NI requires the recognition of a syntactic element in the form of a grammatical function, the INCORPORATE, as first discussed in Asudeh (2007) and Asudeh and Ball (2005). As a non-set valued, non-subcategorized ADJUNCT (Asudeh 2007), the INCORPORATE links, I propose, to a thematic role in the argument structure, making the INCORPORATE indispensable to a principled explanation of analytic NI.<sup>2</sup>

The remainder of this paper is ordered in the following way. I review Chuj and K'ichee' NI data paying attention to the unusual dialectal variation of NI in Chuj. A discussion follows about the semantics of bare indefinites from various authors, and the non-projecting semantic argument (NPSA) (Asudeh 2007; Asudeh and Ball 2005). Following that is a presentation of the Chuj and K'ichee' NI data within the LFG framework. The paper ends with an elaboration of the INCORPORATE as a part-argument, part-adjunct GF.

## 2 Noun incorporation in Chuj

NI in Chuj occurs when the direct object, in the form of an unmarked noun stem, is 'incorporated' into the verb. When N incorporates, the NI verb detransitivizes. As an intransitive, the noun incorporating verb is uncontroversial because of multiple indicators of intransitivity in the verb morphology.

### 2.1 About Chuj

An active transitive clause with VOS word order is shown in example (1). England (1991:463-464) claims that in the San Mateo Ixtatán dialect, both VSO and VOS are permitted. But in San Sebastián Coatán, basic word order is VSO only:<sup>3</sup>

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<sup>2</sup> Elsewhere I suggest an alternate, lexicon-based analysis for synthetic NI found in, for example, the lowland Mayan languages of Ch'orti', Itzaj, and Yucatek Mayan.

<sup>3</sup> (ss) refers to the San Sebastián Coatán dialect of Chuj while (sm) refers to the San Mateo Ixtatán dialect of Chuj as spoken in Guatemala.

- (1) Ix-s-mak' waj Xun ix Malin CHUJ  
 COM-3S<sub>ERG</sub>-hit NC John NC Mary  
 'Mary hit John (Dayley 1981:35).'

Example (2) shows a root intransitive (Maxwell 1976:131). Intransitives in Chuj are characterized by having a single agreement marker, called the Set B absolutive (ABS), mark the SUBJ (Maxwell 1976:128):

- (2) Tz-onh-b'ey-i (SS)  
 INC-1PL<sub>ABS</sub>-walk-IPF  
 'We walk (Maxwell 1976:130).'

Let us now look at the NI construction in Chuj, as shown in (3):<sup>4</sup>

- (3) a. Ix-ach-mak'-w-i anima (SM)  
 COM-2S<sub>ABS</sub>-hit-NI-IPF people  
 'You hit people (Dayley 1981:35).'
- b. Ix-in-al-w-i ab'ix (SM)  
 COM-1S<sub>ABS</sub>-tell-NI-IPF stories  
 'I told stories (Maxwell 1976:131).'

With regards to verb agreement, the absolutive also marks subject agreement in the intransitive NI verb (Maxwell 1976:135). Thus it can be safely assumed that Chuj's incorporated noun never controls verb agreement.

## 2.2 Restrictions on Chuj's incorporated nouns

This section reviews all the restrictions on the incorporated nouns of the San Mateo and San Sebastián dialects of Chuj.

### 2.2.1 Generic restrictions on Chuj's incorporated nouns

Maxwell (1976:133) distinguishes two divergent forms of the incorporated noun in Chuj. Let us begin our review with elements of the incorporated noun common to the dialects of Guatemalan Chuj.

In both Chuj's dialects, generic limitations on incorporated nouns include, but are not limited to, the following restrictions. The incorporated noun may not be modified by a determiner (4a), by a number, or by a noun classifier. In addition, it cannot be possessed (4b) (Maxwell 1976:132):

- (4) a. \*Ix-in-kuy-w nik anma' (SM/SS)  
 COM-1S<sub>ABS</sub>-teach-NI DET people  
 (\*'I taught the people (Maxwell 1976:132).')

<sup>4</sup> Interlinear glosses of the Chuj data are drawn mainly from Dayley (1981), Hopkins (1967), Maxwell (1976), Robertson (1980, 1992), and Williams and Williams (1966).

- b. \*Ix-in-ten-w                      he-lu'um                      (SM/SS)  
       COM-1SABS-mash-NI 2SPOSS-dirt  
       (\*‘I mashed your dirt (Maxwell 1976:133).’)

### 2.2.2 Further restrictions on San Mateo’s incorporated noun

San Mateo’s incorporated noun has two further restrictions, neither of which apply to San Sebastián’s (Maxwell 1976:133). Post-nominal modifying adjectives (5a), and relativization (5b), are disallowed in San Mateo:

- (5) a. \*Ix-in-al-w-i                      ab'ix kuseltak                      (SM)  
       COM-1SABS-tell-NI-IPF story sad  
       (\*‘I told a sad story (Maxwell 1976:133).’)
- b. \*Ix-in-kuy-w-i                      anima s-mun-l-aj                      t'atik                      (SM)  
       COM-1SA-teach-NI-IPF people 3SERG-work-TRA-INT here  
       (\*‘I taught the people who work here (Maxwell 1976:133).’)

Nonetheless a limited number of adjectives precede incorporated nouns in San Mateo, although these adjectives form adjective-noun compounds (6a) (Maxwell 1976:133–4). San Mateo’s incorporated noun can also be a noun-noun (N-N) compound (Maxwell 1976:fn.4):

- (6) Ix-in-pak-w-i                      takinh-awal                      (SM)  
       COM-1SABS-bend-NI-IPF ADJEC:dry-cornstalks  
       ‘I bent dry cornstalks (Maxwell 1976:134).’

With regards to verb agreement, the subject (agent) of the transitive controls the verb’s ergative agreement marker while the object (patient) controls the verb’s absolutive agreement marker (Maxwell 1976:135). However with regards to the NI verb, the subject controls the verb’s sole agreement marker, the absolutive. In sum, only bare indefinites and adjective-noun and noun-noun compounds can function as incorporated nouns in San Mateo.

### 2.2.3 Fewer restrictions on San Sebastián’s incorporated noun

In contrast to San Mateo’s, San Sebastián’s incorporated noun is far less constrained, differing in two fundamental ways. San Sebastián’s incorporated noun allows prenominal (non-compounding) adjectives and postnominal adjectives, and limited types of relative clauses (Maxwell 1976:135, 137).

San Sebastián’s incorporated noun allows ‘some preceding adjectives,’ but crucially these prenominal adjectives, like *al* ‘heavy’ in (7), appear not to form adjective-noun compounds (Maxwell 1976:135). And adjectives, also like *al* ‘heavy’ in (7), can appear postnominally (Maxwell 1976:136):

- (7) Hin-man-w {al líwru, líwru al} (ss)  
 1SABS-buy-NI heavy book, book heavy  
 ‘I bought a heavy book (Maxwell 1976:135).’

Secondly the two restrictions on San Mateo’s incorporated noun, as shown in (5a, b) do not apply to San Sebastián’s incorporated noun (Maxwell 1976:136–7). But not all relative clauses are allowed, as shown in (8c):

- (8) a. Ix-in-awt-w hunh ix-il-c[ha]j-i (ss)  
 COM-1SABS-read-NI paper COM-see-PAS-IPF  
 ‘I read the paper (that) was seen (Maxwell 1976:137).’
- b. Hin-man-w lum ajtil x-in-el-a (ss)  
 1SABS-buy-NI land where COM-1SABS-see-TPF  
 ‘I bought the land where you saw me (Maxwell 1976:137).’
- c. \*Ix-in-awt-w hunh ix-w-il-a (ss)  
 COM-1SABS-read-NI paper COM-1SERG-see-TPF  
 (\*‘I read the paper I saw (Maxwell 1976:137).’)

In sum, only San Sebastián allows adjectives as non-compounding prenominal modifiers, and adjectives and relative clauses as postnominal modifiers.

#### 2.2.4 Noun incorporation in Chuj’s agentives and instrumentals

Finally let us examine the ‘incorporation of objects into NPs,’ the agentives (9a), and the instrumentals (9b) (Maxwell 1976:138):

- (9) a. Tz’ib’-m hu’unh (ss)  
 write-AGT paper  
 ‘Writer of papers (Maxwell 1976:138).’
- b. Tz’ib’-l-ab’ hu’unh (ss)  
 write-NOM-INSTR paper  
 ‘Writing tool for paper (Maxwell 1976:138).’

The *-(u)m* suffix (SM) represents the nominalizing actor morpheme (Hopkins 1967:92–3, 257), while the *-ap’* suffix (SM) represents the instrument morpheme (Hopkins 1967:85, 253). Note that the bare indefinites of the nominalized forms are constrained in exactly the same manner as are the incorporated nouns of the NI verb construction.

The nominalization data afford us an important insight into the formation of NI constructions. The initial word in the two-word construction is marked for the appropriate agentive or instrumental nominalization, and not the second word, the incorporated noun. On the assumption that derivational processes occur only in the lexicon, we are able to conclude from the data that NI is an analytic construction. Accordingly, we can reasonably infer that NI is post-lexically formed.

## 2.3 The semantics of noun incorporation

As noted above, the NI construction and its structural aspects have been the subject of a long and contentious debate in American linguistics. However in recent years, NI has received increased attention from semanticists. The semantic focus has been primarily on argument structure, on NI's unique scopal properties, and on the incorporated noun's role as a discourse antecedent. In this section, I briefly examine the semantics of NI, beginning with the seminal research of Van Geenhoven (1995; 1996; 1997; 1998a,b) followed by the more recent analyses of Chung and Ladusaw (2004).

### 2.3.1 The semantics of the bare indefinite

In this section, I review Van Geenhoven's structural and semantic approaches to NI in West Greenlandic. Van Geenhoven considers the historical debate about NI as either a lexically or syntactically formed construction to be the result of an uncritical acceptance of the theta criterion (Chomsky 1981). From a truth-conditional perspective, Van Geenhoven reasons that the theta criterion cannot adequately account for the syntactic expression of the argument structure of an incorporating verb. Instead she suggests that lexical and syntactic explanations can co-exist. Accordingly she recommends a structural representation of morphological NI word formation that is a 'syntactically base generated' sub-phrasal construction.

The fallacy in Van Geenhoven's structural analysis rests on the assumption that lexical categories can only participate in lexical operations. Nonetheless the focus of Van Geenhoven's analysis of NI is predominantly semantic. She analyzes West Greenlandic incorporated nouns, English and West Germanic bare plurals, German split topics, and existentials as instances of narrow scope indefinites. Essentially Van Geenhoven identifies incorporated nouns as predicative indefinites, interpreting them and most other narrow scope indefinites as property-denoting descriptions. She claims that incorporated nouns provide a predicate that is absorbed by the incorporating verb as a restriction on the internal argument of the incorporating verb. Van Geenhoven refers to the semantic process of the absorption of predicative indefinites as *semantic incorporation*, which, during the process, generates the narrow scope of the incorporated noun. For type theory, predicative indefinites are type  $\langle e, t \rangle$ , while free variables are type  $\langle e \rangle$  (cf. Partee 1987).

Example (10a) shows a West Greenlandic standard transitive, and (10b) shows its predicate logic analysis by Van Geenhoven (1998b:243):

- (10) a. Nuka-p iipili neri-v-a-a. W. GREENLANDIC  
Nuka-ERG apple-ABS eat-IND-[+TR]-3SG.3SG  
'Nuka ate a particular apple (Van Geenhoven 1998b:243).'
- b.  $\lambda y_e \lambda x_e [\text{eat}(x, y)]$

- c. Nuka            iipili-tur-p-u-q.    WEST GREENLANDIC  
                       Nuka-ABS apple-eat-IND-[-TR]-3SG  
                       ‘Nuka ate an apple/apples (Van Geenhoven 1998b:240).’
- d.  $\lambda P_{\langle e,t \rangle} \lambda x_e \exists y [eat(x, y) \wedge P(y)]$

Example (10c) shows a West Greenlandic NI verb, and in (10d), the predicate logic analysis of semantic incorporation by Van Geenhoven (1998b:240). The crucial change from (10b) to (10d) is that the incorporated noun includes the symbolic representation of  $P(y)$ . This just means that the variable  $y$ , which represents the restriction of the meaning of the original syntactic object, has as its new function a property,  $P$ . In other words, the semantics of the restricted free variable, the object, has changed to that of a predicative indefinite, which here is an incorporated noun. This analysis, more or less, forms the basis of most current approaches to the semantics of NI.

The overall response to Van Geenhoven’s theory of semantic incorporation is somewhat mixed. On the one hand, Farkas and de Swart (2003:10–11) accept semantic incorporation’s core assumption that incorporated nouns are property-denoting arguments, or predicate modifiers. Chung and Ladusaw (2004:14–18) also adhere to the Property theory of indefinites, which holds that some or all indefinite DPs can be interpreted semantically as properties of the type  $\langle e, t \rangle$ . On the other hand, Farkas and de Swart (2003:2–4) reject Van Geenhoven’s purely semantic view of (noun) incorporation. The reasons include that the incorporated noun has a special morphosyntax, and that the incorporated noun is syntactically invisible in intransitive NI constructions (Farkas and de Swart 2003:3, 11). In general, Farkas and de Swart (2003:156–7) do not accept that semantic incorporation can account for both incorporated nouns and all other narrow scope indefinites and existentials.

West Greenlandic’s incorporated noun also has adnominal or stranded modifiers, which Van Geenhoven (1998a:17–22, 146–159) refers to as (discontinuous) external modifiers. They include adjectives, numerals, *wh*-words, other nouns, and even relative clauses. Van Geenhoven offers two important insights into the semantics of external modifiers. Incorporated nouns and their external modifiers are predicates of the same variable, and that it is unnecessary to semantically interpret the incorporated noun and the external modifier as a single syntactic unit. However Van Geenhoven’s semantic incorporation of external modifiers requires a more complicated composition than the incorporated nouns they modify. Because of this, Van Geenhoven’s analysis of stranded modifiers has not, on the whole, been well received (Chung and Ladusaw 2004:115–6; Farkas and de Swart 2003:156).

The approach of Chung and Ladusaw (2004) to incorporated nouns as property-denoting indefinites mirrors Van Geenhoven’s semantic incorporation. The core difference between the two approaches is the mode of composition. That is, Chung and Ladusaw (2004:22) hypothesize that different modes of semantic composition of property-denoting indefinites of type



$\langle e, t \rangle$  will manifest different syntactic structures, assuming truth-conditional equivalency. The first mode of semantic composition of indefinites, called *Specify*, results in indefinites that are scopally unrestricted and that fully saturate the internal argument by function application (Chung and Ladusaw 2004:16). The second mode of composition of indefinites, called *Restrict*, restricts but does not saturate the internal argument. *Restrict* is very similar in spirit to semantic incorporation but the implementation and results differ somewhat. Thus incorporated nouns, stranded modifiers, and doubled DPs all compose with the variable of the verb's internal argument but do so using a variety of compositional modes.

### 2.3.2 The Non-Projecting Semantic Argument (NPSA)

In explaining NI in Niuean, Asudeh (2007) proposes the non-projecting semantic argument (NPSA), framed within LFG and Glue compositional semantics. Two assumptions underlie the NPSA: the existence of non-projecting words (cf. Toivonen 2003), and an explicit 'level of semantic structure.' The first assumption involves the proposition that, although the verb-incorporated noun (v- $\hat{N}$ ) unit remains inseparable in the syntax, it does not form a single lexical item (Asudeh 2007:1). The second assumption involves the notion that an NP can possess an argument at semantic structure that remains invisible to syntactic processes. The incorporated noun is not a syntactic argument but is instead semantically related to the verb.

The incorporated noun can be modified by nominal elements that adjoin to the NP complement of the incorporating verb (Asudeh 2007:6; Asudeh and Ball 2005:2, 8). The INCORPORATE's phrasal part is called the remnant (Asudeh 2007), another term for a stranded modifier. At first glance, it might seem incongruous that the INCORPORATE can extend over several levels of X-bar structure. Yet this is an entirely acceptable practice in LFG and can be seen, for example, in the way that discontinuous constituents in Warlpiri unify in f-structure (cf. Bresnan 2001:326–7, 393–4).

## 2.4 Explaining noun incorporation in Chuj

This section provides explanations within the LFG framework for the NI construction in the San Mateo and San Sebastián dialects of Chuj.

### 2.4.1 Noun incorporation in San Mateo Chuj

I assume that Chuj's predicate initial clause is canonical and possesses the same phrase structure as that of Kaqchikel, a sister language to K'ichee':

$$(11) [ {}_S V^0 XP^* ] \quad (\text{Broadwell 2000})$$

To implement the NPSA, I begin with the San Mateo data in (3b), repeated here as (12). The clause consists of the NI verb complex *ixinalwi ab'ix*

‘I told stories (lit. ‘I story-told.’).’ Note that in Chuj, as in many Mayan languages, overt lexical subject and object NPs are optional (‘pro-drop’) because they are usually cross-referenced on the verb. Note also that the third person singular absolutive agreement marker is a zero anaphora and is thus never represented in LFG’s c-structures. Because all the Chuj data cited in this paper are verb initial clauses, the phrase structure in (11) will suffice:

- (12) Ix-in-al-w-i                      ab’ix                      (SM)  
       COM-1SABS-tell-NI-IPF stories  
       ‘I told stories (Maxwell 1976:13).

The derivational NI morphology *-wi* marks the verb, not the incorporated noun. This is an important point for NI theory development. It means that it is impossible for the incorporated noun to morphologically incorporate into the verb complex to form a lexical N-V compound. The incorporated noun is morphologically and of course categorially distinct from the incorporating verb, and therefore, syntactically individuated. Therefore NI in Chuj is analytic, not synthetic. From this empirical observation, we infer that NI in Chuj is a post-lexical construct.

The annotated phrase structure for (12) is (13). The second line of phrase structure in (13) represents the c-structure rule for analytic NI. The incorporated noun’s ( $\hat{N}$ ) first functional description indicates  $\hat{N}$  is an ARGUMENT in semantic-structure ( $\sigma$ -str) (Asudeh 2007). The second line indicates that  $\hat{N}$  is the grammatical function INCORPORATE in f-structure. Crucially  $\hat{N}$  is assimilated into the semantics in spite of it not being a subcategorized GF:

- (13) S  $\rightarrow$  V<sup>0</sup>  
        $\uparrow=\downarrow$   
       V<sup>0</sup>  $\rightarrow$  V<sup>0</sup>                       $\hat{N}$   
        $\uparrow=\downarrow$  ( $\uparrow_{\sigma}$ ARGUMENT) $=\downarrow_{\sigma}$   
       ( $\uparrow$  INCORP) $=\downarrow$

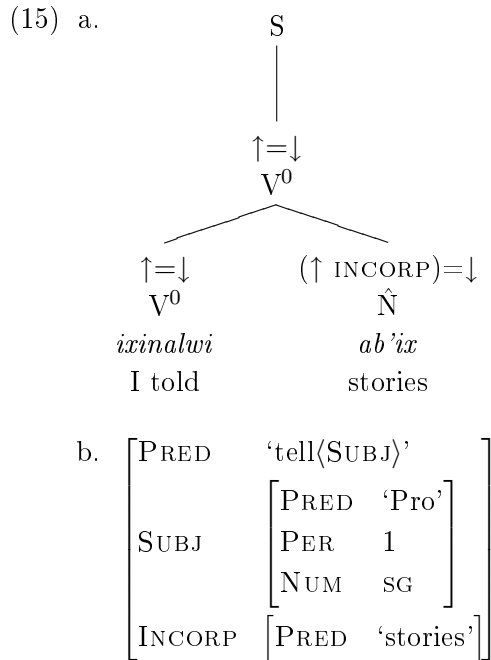
It is assumed that some lexical rule converts the transitive verb to the intransitive NI verb. (14) is the lexical entry for the incorporating verb *ixinalwi*:

- (14) *ixinalwi* :        V<sup>0</sup>    ( $\uparrow$  PRED) = ‘tell(SUBJ)’  
                               ( $\uparrow$  ASP) = COM  
                               ( $\uparrow$  SUBJ PRED) = ‘Pro’  
                               ( $\uparrow$  SUBJ CASE) = ABS  
                               ( $\uparrow$  SUBJ NUM) = SG  
                               ( $\uparrow$  SUBJ PER) = 1

It is also assumed that a lexical rule converts a projecting noun (N<sup>0</sup>) into a non-projecting noun ( $\hat{N}$ ). Context free rules (Chomsky 1986), such as phrase

structure rules, determine the syntactic grouping of words according to the words' syntactic category. Only unary lexical rules can convert or derive syntactic categories, like an  $\hat{N}$  from an  $N^0$ , context free rules cannot.

The c-structure for example (12) is (15a), and its f-structure is (15b):



### 2.4.2 Noun incorporation in San Sebastián Chuj

I begin this section with the canonical phrase structure rule for the predicate-initial clause S(entence) of San Sebastián Chuj. Crucially the San Sebastián Chuj dialect licenses an INCORPORATE remnant, which is (vacuously) adjoined to the NP complement of  $V^0$ :

$$(16) \quad S \rightarrow V^0 \quad \text{NP} \quad \text{DP} \\
 \quad \quad \uparrow=\downarrow \quad (\uparrow \text{ INCORP})=\downarrow \quad (\uparrow \text{ SUBJ})=\downarrow$$

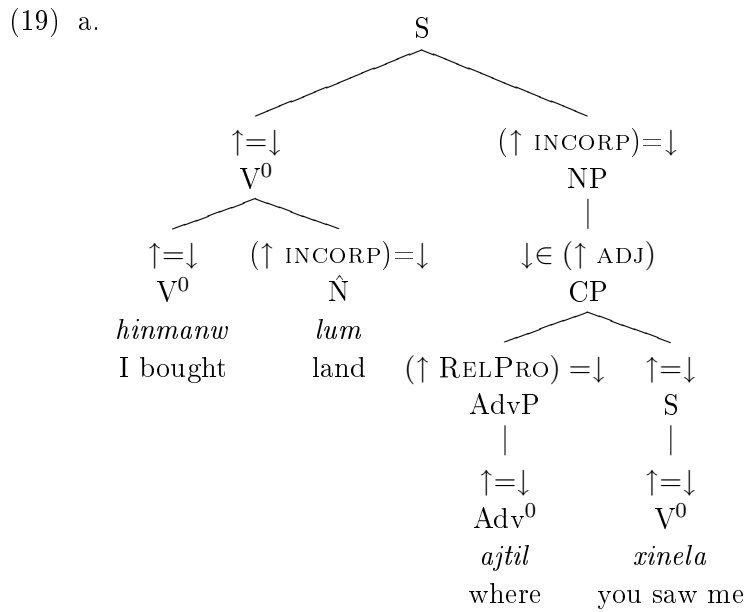
**The relative clause as stranded modifier** As stranded modifiers of incorporated nouns, Chuj's relative clauses are unusual because of their structural range and complexity. In (8a), repeated below as (17), the relative *ajtil xinela* 'where you saw me,' a bivalent clause with pro-drop headed by the relativizing adverb *ajtil* 'where,' modifies the incorporated nominal.

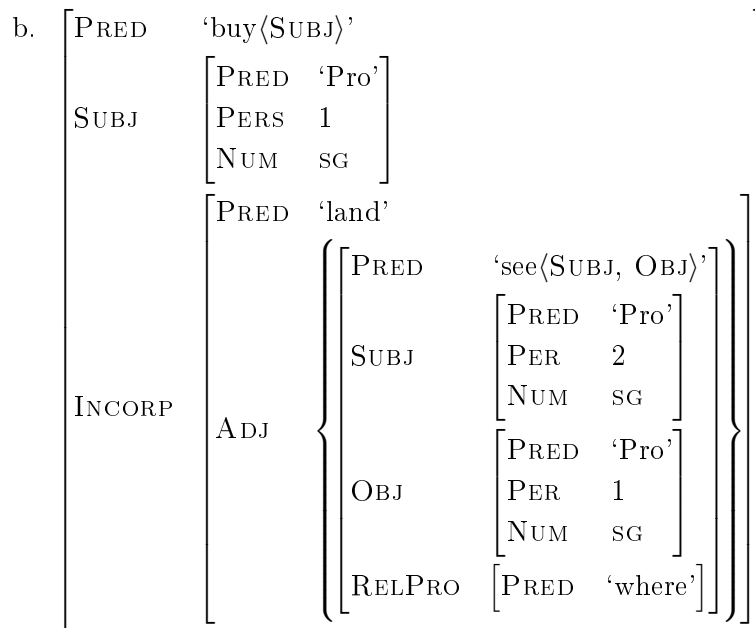
$$(17) \quad \text{Hin-man-w} \quad \text{lum} \quad \text{ajtil} \quad \text{x-in-el-a} \quad (\text{ss}) \\
 \quad \quad 1\text{SABS-buy-NI} \quad \text{land} \quad \text{where} \quad \text{COM-1SABS-see-TPF} \\
 \quad \quad \text{'I bought the land where you saw me (Maxwell 1976:137).'}$$

The phrase structure for example (17) is (18):

- (18)  $S \rightarrow V^0 \quad NP$   
 $\uparrow=\downarrow (\uparrow \text{ INCORP})=\downarrow$
- $V^0 \rightarrow V^0 \quad \hat{N}$   
 $\uparrow=\downarrow (\uparrow \text{ INCORP})=\downarrow$
- $NP \rightarrow NP \quad CP$   
 $\uparrow=\downarrow (\uparrow \text{ INCORP})=\downarrow$
- $CP \rightarrow \text{ AdvP} \quad S$   
 $(\uparrow \text{ RelPro}) =\downarrow \uparrow=\downarrow$
- $\text{ AdvP} \rightarrow \text{ Adv}^0$   
 $\uparrow=\downarrow$

The c-structure in (19a) represents (17), while its f-structure is (19b). It is essential to keep in mind that the INCORPORATE is a non-governable, non-subcategorized modifying ADJ of the incorporating verb in f-structure, but is a full argument of the incorporating verb in sem-structure:





**The prenominal adjective as modifier** The following NI construction includes a prenominal adjective. Example (7), repeated here as (20) revised, shows the prenominal, non-compounding adjective *al* ‘heavy’:

- (20) Hin-man-w al líwru (SS)  
 1sABS-buy-NI heavy book  
 ‘I bought a heavy book (Maxwell 1976:135).’

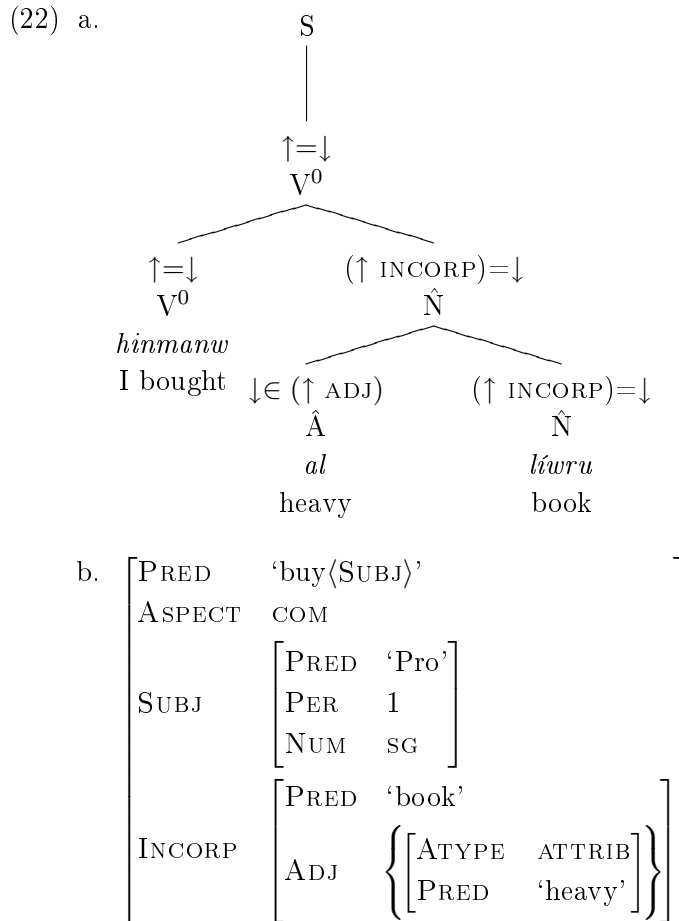
The prenominal adjective *al* ‘heavy,’ which modifies the incorporated noun, is, I believe, a non-projecting adjective ( $\hat{A}$ ) that head-adjoins to the incorporated noun. The prehead modifying adjective has the lexical entry in (21a). Example (20) is represented by the phrase structure in (21b):

- (21) a.  $al : \hat{A} \ (\uparrow \text{PRED}) = \text{‘heavy’}$   
 b.  $S \rightarrow V^0$   
 $\uparrow = \downarrow$   
 $V^0 \rightarrow V^0 \hat{N}$   
 $\uparrow = \downarrow \ (\uparrow \text{INCORP}) = \downarrow$   
 $\hat{N} \rightarrow \hat{A} \hat{N}$   
 $\downarrow \in \ (\uparrow \text{ADJ}) \ (\uparrow \text{INCORP}) = \downarrow$

Note that the two adjunction structures in (21b) are licensed by the *Adjunction Identity* condition (Toivonen 2003), which simply states that, ‘Same adjoins to same.’ This suggests that both  $X^0$  and  $\hat{X}$  can dominate lexical

material. In other words, the non-projecting adjective may adjoin to the non-projecting noun, according to Adjunction Identity.

I suggest that example (20) can be represented by the c-structure in (22a). Its f-structure is shown in (22b). Crucially the adjective type in (22b) is attributive, not predicative:



### 3 Noun incorporation in K’ichee’ Mayan

K’ichee’ also has the NI construction, and it is identical to Chuj’s, except for one important difference. Whereas in Chuj the subject of the NI verb controls agreement, in K’ichee’ either the subject or the INCORPORATE can control agreement. In this section, I offer empirical support for the INCORPORATE as a type of GF, and in the process, account for K’ichee’s NI construction.

#### 3.1 The incorporated noun in K’ichee’

The morphosyntax of the NI construction is subject to significant restrictions, and, in particular, the form and distribution of the incorporated noun. Before

addressing agreement, let us first review adjacency and extraction data for the incorporated noun in K'ichee'.

Subject DPs, as in (23), and adjuncts, such as manner adverbs and prepositional phrases, cannot occur between the verb and the incorporated noun:

- (23) \*Utz k-at-paj-ow                    at                    atz'aam  
 well INC-2SABS-weigh-NI 2SINDPRO salt  
 (\*'You measure salt well.')

The incorporated noun cannot be extracted to a preverbal position immediately before the verb. Normally it is quite acceptable for a bare nominal to occupy this immediate preverbal location, the generic focus position:

- (24) \*Utz atz'aam k-at-paj-ow                    at  
 well salt            INC-2SABS-weigh-NI 2SINDPRO  
 (\*'You measure salt well.')

The incorporated noun cannot extract to the sentence-initial topic position in Spec,CP. One should keep in mind that this is not an entirely unexpected result because Mayan topics are subject to a specificity restriction:

- (25) \*Carro na    utz    ta    k-a-b'iin-i-sa-n                    lee    achii  
 car        NEG good IRR INC-EPE-drive-SFV-CAUS-NI DET man  
 (\*'The man car-drives badly.')

We have noted above that the NI construction is subject to obligatory narrow scope. Because the incorporated noun is definite, (26) is ungrammatical:

- (26) \*At                    utz    k-at-b'iin-i-sa-n                    lee    carro  
 2SINDPRO well INC-2SABS-drive-SFV-CAUS-NI DET car  
 (\*'You drive the car very well.')

### 3.2 Verb agreement in K'ichee's NI construction

Verb agreement in K'ichee's NI construction is quite unexpected in light of verb agreement in K'ichee's standard transitive. Agreement in the NI construction is based not on grammatical functions, as in the active transitive, but on the person hierarchy of the arguments themselves. The person hierarchy is defined as local person outranks non-local and plural outranks singular, so that the argument higher on the person hierarchy controls verb agreement. I will refer to the hierarchy as person-salience. We first look at examples of subject agreement, and then, incorporated noun agreement.

If the subject is either 1<sup>st</sup> person or informal 2<sup>nd</sup> person, then it is always cross-referenced by the verb agreement marker:

- (27) Utz k-at-paj-ow                    atz'aam at  
 well INC-2SABS-weigh-NI salt        2SINDPRO  
 'You measure salt well.'

However if the subject is 3<sup>rd</sup> person singular or formal 2<sup>nd</sup> person singular or plural and the incorporated noun is 3<sup>rd</sup> person plural, then the incorporated noun—not the subject—controls verb agreement (Mondloch 1981). Continuing on, (28a) shows that the incorporated noun *ak'* 'chicken' is plural while the subject DP *lee ixoq* 'the woman' is singular. Thus the incorporated noun *ak'* controls verb agreement. Again in (28b), the plural incorporated noun *ak'alaab'* 'children' controls agreement because the formal 2<sup>nd</sup> person singular subject *la* 'you' can never control agreement (Mondloch 1981):

- (28) a. Naj            k-ee-pil-ow                    ak'        lee    ixoq  
 long.time INC-3PLABS-butcher-NI chicken DET woman  
 'It takes a long time for the woman to chicken-gut (M 1981:250).'
- b. Utz k-ee-yuq'u-n                    la                    ak'al-aab'  
 well INC-3PLABS-take.care.of-NI 2SABSHON child-PL  
 'You child-care well (Mondloch 1981:250).'

The examples of K'ichee's NI construction in (28) highlight a serious disjunction for verb agreement in K'ichee'. If the incorporated noun does control agreement, an internal contradiction will result because non-subcategorized constituents like adjuncts never control agreement in K'ichee'. Assuming that agreement is systematized in f-structure, my configuration of it cannot account for control of agreement by the incorporated noun.

### 3.3 Explaining noun incorporation in K'ichee'

Two basic choices are available, regarding the agreement anomaly. The first interprets the NI construction as a bivalent transitive verb and the INCORPORATE as an OBJ. The second interprets NI as a monovalent intransitive and the INCORPORATE as an ADJ. Neither choice is without problems.

#### 3.3.1 Noun incorporation in K'ichee' as transitive

The first approach interprets the NI verb as a bivalent transitive. This approach also retains head-adjunction of the incorporated noun. Agreement control by a subcategorized constituent is accounted for in f-structure along the usual lines. In sum, the ID and LP relations of the INCORPORATE and its mother ( $V^0$ ) undergo substantial realignment from the canonical non-NI bivalent, transitive verb. Yet the INCORPORATE's grammatical relation with  $V^0$  remains the same as the original direct object's. This is because the INCORPORATE functionally identifies with the grammatical object in the f-structure, and links directly to it.



There are advantages and disadvantages in the first approach. The advantage is the theory of agreement is entirely standard and does not introduce any new agreement mechanism into the theory. But a major disadvantage is that it identifies the verb as a transitive even though the verb morphology and morphosyntax is indisputably intransitive. Accepting this first approach incurs the rather disagreeable outcome of overturning long-held accounts of the transitive-intransitive dichotomy of Mayan verbs.

### 3.3.2 Noun incorporation in K'ichee' as intransitive

The second approach interprets the NI verb as a monovalent intransitive. The INCORPORATE will be a non-governable, non-subcategorized grammatical function, a non-set valued ADJUNCT in f-structure. The advantage with this approach is that the morphology is in complete compliance with long-held notions of (in)transitivity in Mayan linguistics. The most obvious disadvantage is the rather messy account of agreement that it engenders.

However there is another way to express agreement in LFG, other than in the f-structure, and that is in the lexical entry. Basically for INCORPORATE control of agreement, there are two sets of constraints required, one on the INCORPORATE and two on the subject. The constraint on the INCORPORATE is simply that it must be plural. The constraint on the subject is two part, but either one must hold for the INCORPORATE to control agreement. The first part requires that the subject be 3<sup>rd</sup> person singular. Failing that, the subject must be the 2<sup>nd</sup> person formal pronominal clitic, either singular or plural, because the formal pronominal clitic never controls agreement.

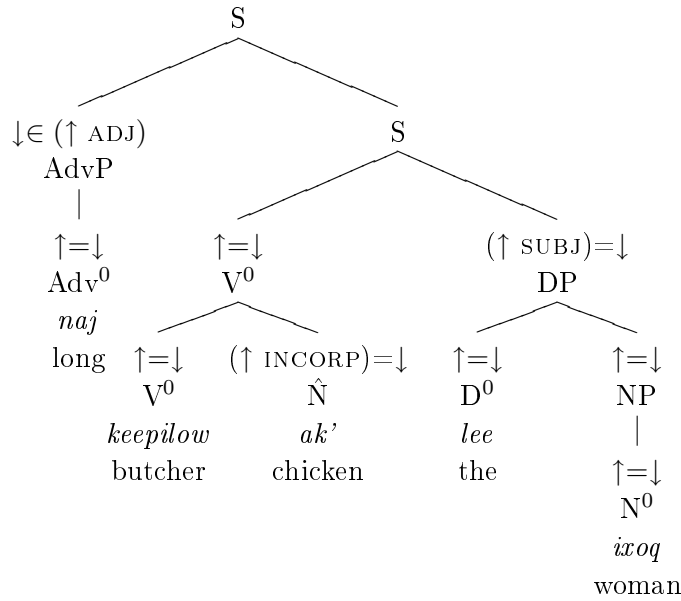
The lexical entries of the NI verb *keepilow* and its INCORPORATE *ak'* from (28) could be the following:

- (29) a. *keepilow* :  $V^0$  ( $\uparrow$  PRED) = 'butcher(SUBJ)'  
( $\uparrow$  SUBJ PRED) = 'PRO'  
( $\uparrow$  SUBJ NUM) = SG  
( $\uparrow$  SUBJ PER) = 3  
( $\uparrow$  INCORP NUM) = PL  
( $\uparrow$  INCORP CASE) = ABS
- b. *ak'* :  $\hat{N}$  ( $\uparrow$  PRED) = 'chicken'

The NI verb rather than the INCORPORATE should have the functional descriptions in its lexical entry to account for the constraints on the INCORPORATE and its agreement interaction with the SUBJ.

The c-structure in (30a) is identical except the INCORPORATE is annotated with ( $\uparrow$  INCORP)= $\downarrow$ , not ( $\uparrow$  OBJ)= $\downarrow$ , while its f-structure is (30b):

(30) a.



b.

PRED	'butcher<SUBJ>'				
ASP	INC				
SUBJ	<table border="1"> <tr> <td>PRED</td> <td>'woman'</td> </tr> <tr> <td>NUM</td> <td>SG</td> </tr> </table>	PRED	'woman'	NUM	SG
PRED	'woman'				
NUM	SG				
INCORP	<table border="1"> <tr> <td>PRED</td> <td>'chicken'</td> </tr> <tr> <td>NUM</td> <td>PL</td> </tr> </table>	PRED	'chicken'	NUM	PL
PRED	'chicken'				
NUM	PL				
ADJ	{ [PRED 'long'] }				

#### 4 The INCORPORATE revisited: a new GF

The central issue at this point is how to account for the INCORPORATE as a grammatical function. In the NPSA, the INCORPORATE is invisible to syntactic processes but retains full argument status at semantic-structure. As we have seen from Van Geenhoven's predicate logic analysis in (10d), at the notional heart of the INCORPORATE is a property-denoting predicate that restricts the verb's internal argument. Although categorically an ADJ, the INCORPORATE is clearly not an ordinary, garden-variety ADJ. In fact, unlike the canonical ADJ in Table 1, the INCORPORATE maps to the argument structure as a set member. I assume that a-structure is a syntactic representation of the mapping of thematic roles to grammatical functions.

A binary-feature matrix can predict or reveal unknown or unrecognized grammatical relations, categories, or constructions. I propose that one of the defining properties of the matrix should be constituent selection by the syn-

		SYNTACTIC SELECTION	
		+	-
SEMANTIC	-	RAISING GF <i>'Juan seems happy.'</i> [PRED 'seem⟨XCOMP⟩SUBJ'] $\lambda P.seem(P)$	ADJUNCT <i>'Maria laughed loudly.'</i> [ PRED 'laugh⟨SUBJ⟩' ] [ADJ {[PRED 'loudly' ]}] $\lambda x.laugh(x)$
	+	SUBCATEGORIZED GF <i>'Fido chased Fluffy.'</i> [PRED 'chase⟨SUBJ,OBJ⟩'] $\lambda y.\lambda x.chase(x,y)$	INCORPORATE <i>'I story-tell.'</i> [PRED 'tell⟨SUBJ⟩'] [ INCORP ['story' ] ] $\lambda P\lambda x.\exists y.[tell(x,y) \wedge P(y)]$

Table 1: Syntactic vs. semantic selection

tax, or more precisely, syntactic subcategorization. This attribute recognizes only argument functions. The second defining attribute should be argument structure encoded as semantic selection. This attribute represents thematic arguments that map to grammatical functions but excludes expletives and canonical ADJUNCTS.

Table 1 shows the division of the two properties or attributes of SEMANTIC and SYNTACTIC selection. Let us begin with the most obvious functions, the SUBCATEGORIZED GFs and the non-subcategorized ADJUNCTS. The former are represented in the a-structure as semantic roles that map to the syntactically selected core and non-core arguments. The latter, or the ADJUNCTS, are selected neither syntactically nor semantically. Next the subject and object RAISING functions are never semantically selected for because they are semantically vacuous, but are selected for syntactically. This we know because subjects of raising verbs control agreement.

Finally in Table 1 the fourth quadrant contains the category unselected for syntactically but selected for semantically. So the grammatical function predicted is the INCORPORATE, which possesses one selectional property but lacks the other. Thus the INCORPORATE fills an unexpected gap in the syntactic-semantic interface. And in a more technical sense, LFG does not seem to possess a dedicated mechanism with which to encode the INCORPORATE in the manner that the three other categories in Table 1 have.

## 5 Conclusion

In this paper, I reviewed the NI construction in Chuj and K'ichee' Mayan. I focused on the incorporated noun in K'ichee and in Chuj's two dialects spoken in Guatemala. I presented the data using the NPSA within LFG architecture. Based on derivational NI morphology, the data support the proposal that NI in Chuj and K'ichee' is analytically formed, and by inference, represents a post-lexical, syntactic construct. I have reviewed the semantics of NI and have concluded that semantics alone falls short of fully accounting for analytic NI. I suggested that the INCORPORATE is a GF unselected for syntactically but selected for semantically. It represents a hybrid category that exhibits a heterogeneous set of properties acquired from subcategorized GFs and non-subcategorized ADJS. The INCORPORATE presents as the following: a non-optional ADJ that structurally manifests lexical head-adjunction as a non-projecting word, obligatory narrow scope, non-extraction, non-iterability, optional control of verb agreement on the basis of the person-salience of arguments, no derivational options (eg. as possessum) except for very limited N-N or A-N compounding, no functional modification, number inflection, and restricted pre-head adjectival and post-head adjectival and relative clause modification functioning in a detransitivized clause.

In the end, I have identified an intermediate linguistic space, as illustrated in Table 1 of this paper. It is occupied by the INCORPORATE, but potentially available to other, similar in kind hybrids. Grimshaw (1990:109–132), for example, long ago introduced the notion of argument suppression manifested as an argument adjunct (*a-adjunct*). Passives, for example, suppress an external argument (EA) a-structure position with the result that it is not  $\theta$ -marked. But contrarily, the a-adjunct is still related to or licensed by the a-structure. More recently, Rákosi (2006) has proposed a refinement of the generic athematic category of ADJS. As way of explaining circumstantial PPs, Rákosi (2006) introduces the thematic adjunct ( $ADJ_{\theta}$ ), suggesting that certain types of adjuncts link thematically to a-structure. But it differs from the INCORPORATE in that the use of  $ADJ_{\theta}$  remains optional.

It is also conceivable to consider the INCORPORATE as just a representational expedience. Nonetheless acceptance of an argument-adjunct category, and an inclusive one at that, should make accessible a greater number of previously unexplained linguistic inconsistencies.

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