

# Is Head Movement Still Needed for Noun Incorporation? The Case of Mapudungun

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**Abstract:** This paper compares Baker’s head-movement analysis of noun incorporation to alternative nonlexicalist theories of noun incorporation, including Massam’s pseudo-incorporation analysis, Van Geenhoven’s base generation analysis, and the Koopman/Szabolcsi analysis in terms of remnant movement. It is shown that the head-movement approach captures important facts about noun incorporation in the Mapudungun language that the other theories would so far leave unexplained. I conclude that the device of head-movement is still needed in generative theory, contrary to the reductivist hopes of some minimalist syntacticians.

**Keywords:** Noun incorporation, head movement, Mapudungun, semantic incorporation

## 1. Introduction: The Theoretical Significance of Noun Incorporation

Since the early-to-mid 1980s, noun incorporation (NI) has played an important role in discussions about the relationship between morphology, syntax, and the lexicon. At issue has been the relationship between minimal pairs such as the one shown in (1) from the Chilean language Mapudungun. (1a) is an ordinary example of a verb combining with a full NP/DP object in the syntax to create a transitive clause. (1b) is a near-paraphrase of (1a), in which the noun root interpreted as the object argument of the verb is combined with the verb root into a kind of compound verb that constitutes a single morphological object (a verb) for purposes of inflection (Baker et al., 2005).<sup>1</sup>

- (1) a. Ñi chao kintu-le-y ta chi pu waka. (Salas 1992:195)  
my father seek-PROG-IND.3sS the COLL cow  
'My father is looking for the cows.'

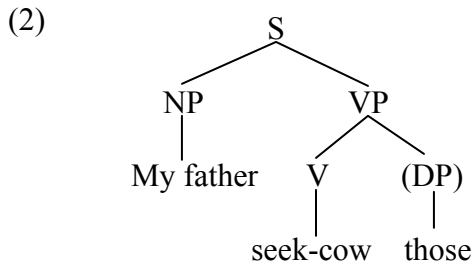
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<sup>1</sup> Most of the Mapudungun data reported here comes from Baker et al. (2005). More information about ultimate sources and additional references can be found there. Abbreviations used in the glosses include the following: ABS, absolutive case; ADJ, adjectival suffix; APPL, applicative; COLL, collective; ERG, ergative case; IND, indicative mood; NEG, negative; PAST, past tense; POSS, possessive particle; PROG, progressive; PRT, particle; STAT, stative; 1sS, first singular subject agreement; 3sS, third singular subject agreement; 3O, third person object; 3pS, third plural subject agreement.

- b. Ñi chao kintu-waka-le-y.  
 my father seek-cow-PROG-IND.3sS  
 ‘My father is looking for the cows.’

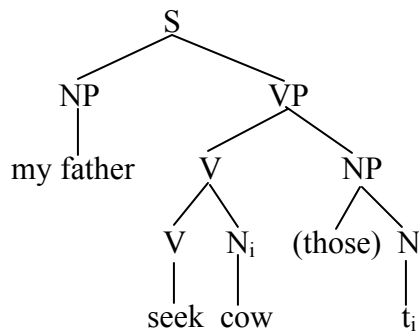
The original question, then, was whether instances of noun incorporation like (1b) are derived in the syntax from a source similar to (1a), or whether they are formed in the lexicon by an ordinary process of compounding. At stake in the discussion was the Lexicalist Hypothesis—the question of whether syntactic processes can build words or not, or more generally whether syntax and morphology are independent components of grammar.

Prominent proponents of the lexicalist view on this question have included Mithun (1984), Di Scullo and Williams (1987), and Rosen (1989), among others. These researchers have held that NI is simply a type of compounding in which a noun root and a verb root combine to form a new verb stem in the lexicon. The noun root is not a separate entity from the verb root at any syntactic level of representation, and it does count as the direct object of the clause. The only real syntactic issue is that the complex verb stem can count as a transitive verb or as an intransitive verb, depending on the language. Thus, the syntactic structure of (1b) for the lexicalist is simply something like (2).



In contradistinction to the lexicalist approach, I have argued consistently for a syntactic approach to NI, in which (1b) is formed in the syntax. I originally present this view in Baker (1988) and have refined it in subsequent work (Baker, 1995, Baker, 1996, Baker et al., 2005). (See also Sadock (1980) for an important precedent to my view, which he has developed in a distinctive way (Sadock, 1985, Sadock, 1991).) More specifically, I argued for a particular kind of syntactic approach, in which the original structure of an example like (1b) is rather like that of (1a), but a movement process applies, taking an  $N^0$  node from its base position and adjoining to the  $V^0$  node in the syntax. This is shown schematically in (3).

(3)



In brief, I have analyzed noun incorporation as an instance of head movement, distinct from but similar to the better-established phenomenon of phrasal movement.

Since the original battle lines of this controversy were drawn, a variety of intermediate positions have been articulated and adopted as analyses of phenomena in particular languages. What these approaches have in common is that they generate NI structures like (1b) in the syntax, but they do not make use of the device of head movement to do so. Included under this description are the base-generation-plus-semantic-incorporation analysis of van Geenhoven (1998, 2002), the pseudo-incorporation analysis of Massam (2001), and “incorporation” via remnant movement, as in Koopman and Szabolcsi (2000).

For the most part the pros and cons of these alternative syntactic approaches to NI have not been systematically identified and debated. One reason for this, at least on my part, is that these views all agree with the head-movement analysis in rejecting the Lexical Hypothesis and hence in believing that syntax and “word-formation” can be heavily entwined. As such, they are fairly close cousins, and there is not so much at stake in deciding which one is correct from a theoretical perspective.

But these views are cousins, not identical twins, and they do differ from each other in other ways that are theoretically significant along other dimensions. Most obviously, the alternative syntactic approaches do not make use of the notion of head movement as something distinct from phrasal movement, as my analysis does. And that might be taken to be a good thing, given that some theoretical concerns about head movement have arisen within the recent Minimalist literature. For example, Chomsky’s (1995) Bare Phrase Structure theory does not draw a sharp theoretical distinction between  $X^0$  level categories and XP level categories; thus it may not be clear in this theory how there can be a phenomenon of head movement that is partially distinct from phrasal movement. Moreover, concern has been expressed over the fact that instances of head movement do not seem to satisfy the Extension Condition, nor does the moved head seem to c-command its trace (depending on how certain notions are defined) (see Matushansky (2006) for recent references and discussion). As a result, Chomsky (2000, 2001) has conjectured that head movement does not exist in the syntax—except perhaps for incorporation cases like those discussed here (Chomsky 2001: 37). There are thus some vultures circling above head-movement, to see if it will die. This gives theoretical bite to the question of whether head-movement is still needed in the analysis of NI. If the answer is no, then it is that much more likely that there is no such thing as head

movement in the syntax at all, possibly leading to a simpler (more minimalist?) picture of how syntactic derivations work.

With this background in mind, my purpose in this article is to survey the various syntactic alternatives to the head movement analysis of NI that are currently available, and identify the testable differences between them. I then consider which of the arguments that have been given in favor of the head movement analysis as opposed to the lexicalist analysis also distinguish the head movement analysis from these syntactic alternatives. In the end, I do not find reason to reject the alternative analyses of NI in the languages they were first proposed for (Niuean, Greenlandic, Hungarian). But I do conclude that head-movement still has an uneliminable role to play in the analysis of NI in languages like Mohawk and Mapudungun. Head movement survives for another day, and the vultures of theoretical simplification must look for somewhere else to dine, I claim.

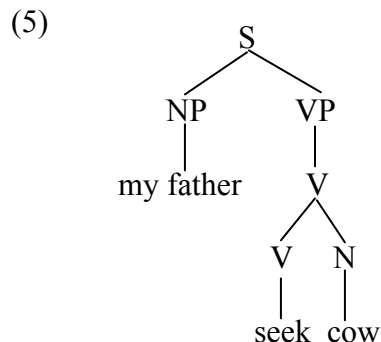
## 2. Three Alternative Varieties of Syntactic Noun Incorporation

What then are these recent alternatives to both the lexicalist analysis schematized in (2) and the head-movement analysis in (3)? I am aware of three.

The most minimal of the alternatives is Massam’s (2001) analysis of “pseudo-noun incorporation” in Niuean. She argues that what has been called NI in that language is simply the result of forming a verb phrase through ordinary syntactic Merge. More specifically, pseudo-noun incorporation is what one gets when the direct object that is the first thing to merge with V does not scramble or undergo object shift to a position outside of the minimal VP. As a result, the object remains adjacent to the verb in a very tight syntactic phrase with it, moving with it to Spec, TP when predicate fronting happens to give predicate-initial order in Niuean. Since the object noun remains adjacent to the verb and in a tight constituent with it, they can be mistaken for constituting a single word (perhaps helped by the application of phrasal phonology). Extending Massam’s analysis to (1b) in Mapudungun would give a structure like the one in (4).

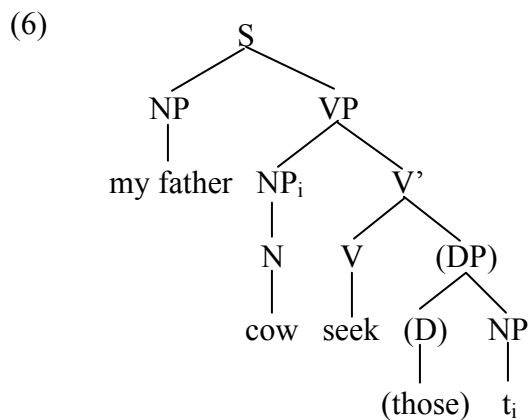
(4) My father ... [VP<sub>i</sub> seek [NP cow ]] INFL t<sub>VP<sub>i</sub></sub>]]

A second sort of syntactic base generation approach is the one adopted by van Geenhoven (1998, 2002) in her analysis of Greenlandic Eskimo—the syntactic side of her influential proposals concerning “semantic incorporation”. She simply assumes that the noun root and the verb root are combined in the syntax to form a larger verb, as shown in (5).



Whereas Massam merges a verb with an NP to make a VP, van Geenhoven merges a verb with a noun to make a verb. (In traditional phrase structure theory, the distinction is clear enough, but note that it could collapse within Chomsky’s Bare Phrase Structure theory.) (5) is also minimally different from the head movement structure in (3) in that there is no movement, and hence no trace in the object position in VP. Finally, the only difference is that the N node is present in the syntactic representation in (5) but not in (2), so the N node can feed into directly into the compositional semantics in (5).

The third syntactic alternative is to reanalyze noun incorporation as “remnant NP movement” along the lines of Koopman and Szabolcsi’s (2000) analysis of verb cluster formation in Hungarian and Dutch. The basic idea of this approach is that many traditional cases of head movement can be reanalyzed as instances of phrasal movement of a very small phrase—one that may happen to contain only a single head, perhaps as a result of other movements that extract everything else out of the phrase. On this view, the Mapudungun sentence in (1b) might be assigned the structure in (6).<sup>2</sup>



Unlike the head-movement analysis, this analysis moves a full phrase and targets a specifier position; hence no conceptual questions arise with respect to Bare Phrase Structure, c-command, or the Extension Condition. As in Massam’s analysis, there is no real word formation in the syntax on this approach; rather the strict adjacency between the NP and the verb (this time derived by movement) allows us to mistake it for a single word, perhaps feeding the phrasal phonology and other PF processes.

This then outlines the conceptual differences among the various syntactic theories of NI and similar phenomena. The question now is what different empirical expectations do these theories create, which can be used to decide between them. I identify four relevant issues, drawing on the previous literature on NI.

### 3. Empirical Issue 1: Can More than a Noun Incorporate?

<sup>2</sup> This structure is somewhat less plausible for Mapudungun than it is for (e.g.) Mohawk, because the incorporated noun in (1b) shows up after the verb root, rather than before it, where you’d expect a specifier to be. But I put this problem aside for the sake of argument.

One of the most obvious motivations for my analyzing NI as head movement rather than phrasal movement was the fact that only a bare noun appears inside the verb in examples like (1b), not a multi-word noun phrase. Of course it is possible for a noun phrase to consist only of a single noun, but it is generally possible for a noun phrase to contain other modifiers, complements, and adjuncts as well, the details depending on the language.

Massam (2001) is well aware of this issue, and uses it as part of her motivation for analyzing Niuean as having pseudo-incorporation, not head movement. She shows that noun-plus-modifier combinations can be “incorporated” in Niuean, as shown in (7).

- (7) Ne *holoholo kapiniu kiva fakaeneene* a Sione.  
 Past wash dish dirty carefully ABS Sione  
 ‘Sione washed dirty dishes carefully.’

“Incorporated” nouns can also be modified by PP-like phrases and infinitival relatives in Niuean, although they cannot be modified by Case, number, determiner, possessor, or finite relative clause.

There is, however, a genuine empirical difference among languages on this point. Modifiers cannot appear with incorporated noun roots in Mapudungun, as shown by (8).

- (8) a. Pedro *ngilla-fi-y küme pulku*. (FM)  
 Pedro buy-IND.3sS good wine  
 ‘Pedro bought good wine.’  
 b. Pedro *ngilla-(*\*küme*)-pulku-pe-y*.  
 Pedro buy-good-wine-PAST-IND.3sS  
 ‘Pedro bought (*\*good*) wine.’

This strongly suggests NI is not mere juxtaposition and phonological phrasing in Mapudungun. The very feature that makes Massam’s pseudo-incorporation analysis so attractive for Niuean also makes it look inappropriate for Mapudungun and similar languages.

The contrast in (8) would also be tricky for the remnant NP movement approach to explain. In this approach, one would have to stipulate either that only a super-small NP can move—one that does not contain any modifiers—or that the modifiers have to extrapose out of NP before the NP moves. Such derivations are probably possible, but it is not obvious why they should be the only possibility. Indeed, it would seem disingenuous to brag that one has eliminated head-movement in favor of phrasal movement when in fact the moved phrase can contain only a single head, for unexplained reasons. In general some movement processes (e.g., passive) must take modifiers and complements along with head nouns, and others (NI in Mapudungun) must not. This makes it seem that the difference between head movement and phrasal movement is real.

This sort of data does not, however, distinguish van Geenhoven’s brand of base-generation from the head movement analysis, since both theories share the idea that it is an N<sup>o</sup> that is adjoined to V, not an NP.

#### 4. Empirical Issue 2: Why Is It Only the Theme/Direct Object that Incorporates?

According to almost all accounts, a very robust property of noun incorporation in many languages is that the incorporated noun (IN) can only be interpreted as expressing the theme/direct object argument of the verb (with some qualifications that need not concern us here). Thus in a Mapudungun example like (1b), repeated here as (9), the IN can only be interpreted as the theme of the seeking action, not as its agent, although either interpretation would be pragmatically possible.

- (9) Ñi chao kintu-waka-le-y.  
my father seek-cow-PROG-IND.3sS  
'My father is looking for the cows.'  
NOT: 'The cow is looking for my father.'

Similarly, in (10) the incorporated noun can only be interpreted as the theme of the buying action, not as the goal/benefactee of that action.

- (10) Juan ngilla-waka-lel-fi-y.  
Juan buy-cow-APPL-3O-IND.3sS.  
'Juan bought a cow for him/her.'  
NOT: 'Juan bought it for the cow.'

We can then ask how each syntactic theory of NI might account for this important fact.

Within the head movement theory of Baker (1988), this fact was taken to follow from the juxtaposition of two independently motivated principles: the fact that only the theme/underlying direct object is generated as the phrase structural sister of the verb (the UTAH), and the fact that head movement can only move a  $X^0$  to adjoin it to the immediately higher  $X^0$  (the Head Movement Constraint). This Head Movement Constraint also regulates other, superficially very different-looking instances of head movement, such as the movement of an auxiliary verb (through T) to C in English (Chomsky, 1986, Travis, 1984). Thus a real explanatory connection was seen between facts like (9) and (10) and contrasts like (11).

- (11) a. What have you bought?  
b. What should you have bought?  
c. \*What have you should bought?

Some theorists went on to argue that the Head Movement Constraint reduces to even more general locality principles that apply to phrasal movement as well, such as the Empty Category Principle (Baker 1988, Chomsky 1986) or Relativized Minimality (Rizzi, 1990). The validity of this broader unification is rather uncertain in the current theoretical context. But even if the Head Movement Constraint does not reduce to other laws of movement, it is still explanatory to the degree that it relates important facts about NI to other well-documented phenomena.

Can the alternative syntactic theories match or improve upon this result?

For the remnant NP movement version, the main challenge would be to explain the restricted interpretation of examples like (10). It would have to say that a remnant NP can move to the relevant Spec position (Spec, vP?) from the theme theta position, and not from the goal theta position. But why should that be? For other types of phrasal movement, the goal NP is if anything easier to move to a higher specifier position than the theme NP is. For example, the goal can move to Spec, TP but the theme cannot in American English (*The woman was given a gift* versus ??*A gift was given the woman*), and the same asymmetry is found in Mapudungun (Baker, 2003). Within a theory such as Baker's (1988), which distinguishes head-movement from phrasal movement, there is a reasonable hope of deriving the difference from the different kinds of locality that are relevant to different sorts of movement—perhaps some sort of Relativized Minimality descended from Rizzi (1990). But this route would not be open to the remnant movement approach, where all movement is phrasal movement. That approach would have to say that locality considerations favor moving the goal when it is a larger constituent that moves (a DP?) but moving the theme when a smaller constituent moves (an NP?). This may not be impossible, but no proposal has been made, and it is not clear how to proceed in a principled fashion.

Consider next the pseudo-incorporation view, in which “incorporation” is simply syntactic juxtaposition. The challenge for this view would be to explain why only the theme nominal can be directly adjacent to the verb in the relevant way—for example, coming between the verb and the associated Infl. This is particularly challenging for Mapudungun, because it is a language with reasonably free word order (Baker, in press) in which overt determiners are not required. It is true that direct objects often follow the verb, perhaps 90% of the time, and this might help create the impression that there are V+N words. But subjects also come immediately after the verb quite often, especially when the verb is intransitive. This does not create (the illusion of) subject incorporation. Even the goal/indirect object can come immediately after the verb, when there is no direct object, or when the direct object is phonologically null, or has been preposed. Nevertheless, there is no illusion of goal incorporation. Surface word order is simply not fixed in Mapudungun in the way it should be to explain the exclusiveness of object incorporation in those terms.

Massam (2001) has the beginnings of an answer for why only the theme can be pseudo-incorporated in Niuean. Her answer hinges on the fact that Niuean is a predicate-initial language, so there is evidence that something containing the V moves to Spec, TP. Massam then claims that the caseless direct objects are the only phrases that are generated in the smallest VP and stay there, so only they are carried forward along with the verb by predicate fronting. Thus only the caseless object is close enough to the verb to create the impression that it is incorporated into it. Conceivably this analysis could be generalized to other languages. There is little or no independent motivation for the generalization, however, since Mapudungun is not a predicate-initial language and there is no other sign that a predicate fronting operation applies in that language.

Finally, what does the base-generated syntactic incorporation view of van Geenhoven have to say about this issue? In this version, the question would be why the N adjoined to V is only interpretable as a predicate of the direct object/theme argument of

the verb, and not as a predicate argument of some other argument.<sup>3</sup> Van Geenhoven attributes this to William's (1980) thematic condition on predication. Williams observed that an adjectival secondary predicate in English can take a theme argument as its subject-of-predication, but not a goal argument, as shown in (12).

- (12) a. John gave Bill the dog dead. (the dog is dead, not Bill)  
 b. #John sent Mary the food hungry.  
 c. John sent Mary to school hungry.

Van Geenhoven suggests that the restricted interpretation of the incorporated noun in (10) is parallel to that of the predicates *hungry* and *dead* in (12), and follows from the same thematic (nonstructural) condition on predication.

Although the parallel between (12) and (10) is interesting and suggestive, I consider van Geenhoven's suggestion dubious. First, much has been learned about double object constructions since Williams's (1980) work. In particular, since Larson (1988) they are usually given an asymmetrical structure in which the goal object asymmetrically c-commands the theme object. If this is correct, then Williams's thematic condition on predication reduces to the familiar structural condition on predication, in which a phrase is predicated of the closest relevant NP (see (13)).

- (13) John gave [<sub>VP</sub> Bill [<sub>V'</sub> <give> the dog [<sub>AP</sub> dead ]]].
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Whereas this covers (12) nicely, it does not extend to (10) on van Geenhoven's analysis. We cannot say that the IN is interpreted as a predicate of the theme because the theme is the NP that is structurally closest to the IN, because the theme argument is not projected in the syntax on van Geenhoven's view.<sup>4</sup>

This last point raises a second objection to van Geenhoven's approach. In her "semantic incorporation" theory, INs are interpreted as predicates of implicit arguments of the verb. But it is a striking fact that other sorts of secondary predicates can not be predicated of implicit arguments (Rizzi, 1986). For example, the theme argument of the verb *feed* can be left implicit, in which case it is interpreted as being bound by a narrow scope existential, as shown in (14b). But an AP cannot be understood as a predicate of this implicit theme argument, as shown by the contrast between (14c) and (14a).

- (14) a. Mary fed John the shrimp raw.  
 b. Mary fed John. (implies: Mary fed John something).  
 c. \*Mary fed John raw. (doesn't mean: Mary fed John something raw.)

<sup>3</sup> Note that this is *unlike* instrumental modifiers in Greenlandic, which can be interpreted as predicates of another internal argument. Thus it does not follow from some general restriction on all forms of predication, either universal or specific to Greenlandic.

<sup>4</sup> If there were a theme argument present as an empty category related to the IN, van Geenhoven's theory would be less distinct from mine, except for the highly technical question of whether chains are base-generated or derived by movement.

Thus, the principles of predication that van Geenhoven needs to make her base-generation approach work are not independently motivated in the way that she thought. This detracts significantly from the attractiveness of her theory.

I conclude that the head movement approach to NI has the most promising things to say about why the IN is interpreted as the theme of the verb, and not its agent or goal, by attributing this to the independently motivated Head Movement Constraint.

### 5. Empirical Issue 3: The Semantic Value of the Incorporated Noun

The third empirical issue to consider is the semantic value of the IN in an NI construction. An important part of the motivation for a syntactic approach to NI since the beginning has been the semantic near-equivalence of sentences with and without NI (see (1)).<sup>5</sup> I took that equivalence to be captured in a theoretically attractive way by saying that the two sorts of sentences are derived from a similar source by a semantically vacuous relationship of movement (Baker 1988). This argument was further developed in Baker (1995, 1996), by showing that the incorporated noun—or better the trace it binds—is interpreted as a normal R-expression in Mohawk, and Baker et al (2005) replicates the argument for Mapudungun.

In contrast, van Geenhoven argues that NI constructions do have a distinctive semantic interpretation in Greenlandic, and she develops her framework specifically to account for this; hence her influential term “semantic incorporation.” More specifically, INs in Greenlandic act like indefinite noun phrases in that they can introduce discourse referents and they show a particular kind of interaction with negation and other sentential operators.

We must now ask whether Baker’s characterization of the semantics of NI is more accurate, or if van Geenhoven’s is, or whether there is a true empirical difference between the languages that they studied. In fact, the last possibility seems to be the true one. The interpretations that are possible for an IN in Greenlandic are also possible for an IN in Mapudungun. For example, an IN can introduce a discourse referent that can be picked up by a subsequent pronoun, as shown in (15).

- (15) Ngilla-waka-n.            Fey langüm-fi-ñ.  
       buy-cow-IND.1sS        then kill-3O-IND.1S  
       ‘I bought a cow. Then I killed it.’

The IN can also be interpreted as a narrow scope existential, but not as an existential that takes wide scope with respect to clausal negation, as shown in (16).

- (16) Mapuche nie-kawell-la-y-ngün.  
       Mapuche have-horse-NEG-IND-3pS  
       ‘The Mapuche do not own horses.’

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<sup>5</sup> I hasten to point out that the semantic equivalence of sentences with and without NI does not imply that they are pragmatically equivalent. NI sentences are different from sentences without NI at least in that they do not allow a topicalized or focused interpretation of the incorporated argument. But that is hardly surprising given the reduced phonological salience of the theme argument in an NI construction as compared to a similar clause without NI.

(Not: ‘There are horses that the Mapuche do not own.’)

But INs also have interpretations in Mapudungun that their Greenlandic analogues apparently do not. For example, the IN in (17) has a definite interpretation, with the result that subsequent reference to it is not blocked by clausal negation.

- (17) Juan ngilla-pullku-la-y. Iñche ngilla-fi-ñ.  
Juan buy-wine-NEG-IND.3sS I buy-3O-IND.1S  
‘Juan didn’t buy the wine. I bought it.’

Here the IN behaves semantically like definite NPs do in English, and not like an existentially quantified implicit argument, as van Geenhoven’s theory would have it (compare the possible sequence *Chris didn’t eat the apple; it is still on the table* with the deviant one *#Chris didn’t eat; it is still on the table*).

Indeed, it can be shown that incorporated nouns in Mapudungun have the same anaphoric properties as unincorporated ones, the properties expected of definite NP anaphora. In particular, they are subject to Condition C of the Chomskian binding theory. Thus, consider the contrast between (18) and (19) in Mapudungun (discussed more fully in Baker et al (2005)).

- (18) #Ti ullcha domo pe-fi-y ti ayü-domo-le-chi wentru.  
the young woman see-3O-IND.3sS the love-woman-STAT-ADJ man  
‘The young woman saw the man who woman-loved (that woman).’ (FM)
- (19) Ti ullcha domo ñi chaw pe-fi-y ti ayü-domo-le-chi wentru.  
the young woman 3.POSS father see-3O-3sS the love-woman-STAT-ADJ man  
‘The young woman’s father saw the man who woman-loved (that woman).’

(18) shows that an IN embedded inside a noun phrase cannot be coreferent with the subject of the sentence that the noun phrase is contained in. In contrast, (20) shows that the same IN can be coreferent with another NP in the same sentence if the antecedent is not the subject of the whole sentence, but rather is the possessor of the subject. In other words, an IN cannot be coreferent with an NP that c-commands it, just as unincorporated definite NPs cannot be in English (Reinhart, 1983).

I take this data to show that incorporation really is a semantically neutral syntactic process in Mapudungun. NI leaves behind a trace in the normal argument position, and in the Minimalist understanding this trace is nothing more than a copy of the original noun. As such, it has the same referential properties as it would have if there had been no incorporation. I agree with Massam (2001) that INs have the same readings as bare NP arguments (as opposed to DPs), but I add that this can include definite as well as narrow-scope indefinite readings in some languages, including Mapudungun (Chierchia, 1998). Since examples comparable to (17) and (19) seem to be ruled out in Greenlandic, van Geenhoven’s semantic incorporation account might be appropriate for that language, but it should not automatically be extended to other languages. In Mapudungun, there is every reason to think that a full NP is present in argument position for purposes of semantic interpretation and discourse anaphora.

## 6. Empirical Issue 4: The Stranding of Possessors

The fourth and final empirical issue to be discussed here concerns the possibility of NI stranding other NP-internal material, such as possessors. Another central motivation for my original head-movement analysis was that the trace left by that sort of movement could provide the crucial link to explain why a sentence like “I car-bought John” can mean “I bought John’s car”, the structure really being [I car-bought [John <car>]]. This issue is also relevant here, because one of the most obvious differences between a theory of head-movement (or juxtaposition) and a theory of phrase-movement (or juxtaposition) is that head-movement is expected to leave behind other material inside the phrase, whereas phrasal movement is not.

Van Geenhoven’s (2002: 779) position on this issue is not really distinct from that of lexicalists such as Mithun and Rosen. She claims that there is really no stranding created by incorporation. It is true that Greenlandic sentences like (20) are often translated as ‘Nuka removed the seal’s skin’, but the NP ‘seal’ is really the third argument of the verb ‘remove’, not the possessor of the incorporated noun ‘seal’. Careful construction of examples shows that a more accurate translation of (21) is ‘Nuka removed the skin from the seal’ (Michelson (1991) makes the same point for Oneida).

- (20) Nuka-p    puisi        ami-ir-paa.  
Nuka-ERG seal.ABS skin-remove-IND.3sS/3sO  
Not really: ‘Nuka removed the seal’s skin’  
Better: ‘Nuka removed the skin from the seal.’

Van Geenhoven may well be right about this point for Greenlandic, but Baker et al (2005) present evidence that possessor stranding is a real phenomenon in Mapudungun. Mapudungun has “stranded possessor” examples such as (21).

- (21) Juan ngilla-waka-fi-y        Pedro.  
Juan buy-cow-3O-IND.3sS Pedro  
‘Juan bought Pedro’s cow.’

Mapudungun also has clear cases of three argument verbs, the theme arguments of which may or may not incorporate:

- (22) iñché wül-ün        kiñe trewa kiñe wentru.  
I give-IND.1sS one dog one man  
‘I gave one dog to one man.’

Now unlike Greenlandic, noun incorporation is optional, and is not required by particular verbs in Mapudungun. Thus, in Mapudungun we should be able to test whether ‘buy’ is a three argument verb in the language by undoing the incorporation and seeing if it can appear in a clearly ditransitive sentence like (23). The answer is no; there is no (23) in Mapudungun that could be the unincorporated version of (21).

- (23) ?\*Pedro ngilla-fi-n ta ñi waka.  
 Pedro buy-3O- IND.1sS PRT 3.POSS cow  
 ‘I bought Pedro his cow.’

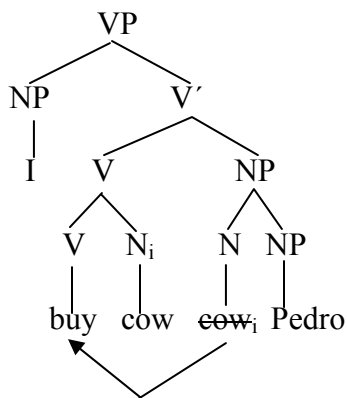
It is true that, although not intrinsically triadic, a verb like ‘buy’ can be made into a three-argument verb by adding applicative morphology to the verb root:

- (24) Juan ngilla-waka-lel-fi-y Pedro.  
 Juan buy-cow-APPL-3O-IND.3sS Pedro  
 ‘Juan bought a cow for Pedro.’

But notice that the semantic interpretation of (24) is not judged to be equivalent to that of (21) by native speakers. Nor is there any sign of an applicative morpheme on the verb in (21) as there clearly is in (24).<sup>6</sup>

The upshot of this discussion is that Van Geenhoven’s semantics for (20) in Greenlandic does not extend to examples like (21) in Mapudungun, there simply being none of the evidence you’d expect that the Mapudungun verb selects three arguments. So the problem of there being a discontinuous semantic dependency between something inside the verb and something outside it is a real one for this language. In the absence of a competing proposal, it might well be that the best way to account for the interpretation of (21) is by having a trace that is bound by the IN and forms a constituent with the possessor, as in the classical head movement account:

- (25)



Genuine examples of possessor stranding like (21) may also distinguish the head movement theory from pseudo-incorporation and remnant movement theories. Massam’s (2001) notion of pseudo-incorporation clearly cannot account for the separation between a noun and its possessor shown in (21), because it does not involve movement at all. NI in Mapudungun could only be reanalyzed as pseudo-incorporation if it could somehow be

<sup>6</sup> Conceivably one could say that (21) has an applicative morpheme in the syntax, but that morpheme is spelled out as  $\emptyset$  if and only if a noun is incorporated into the verb. But I know of no precedent for this sort of morphological dependency, and it is clearly ad hoc.

shown that the NP ‘Pedro’ in (21) is something other than the possessor of the noun, contrary to the evidence we have seen.

The remnant NP movement theory has more chances of success on this point, but unanswered questions would still remain. One possible version of the theory would be to say that the possessor is generated at the DP level of nominal structure in Mapudungun, and what we call NI is the movement of NP out of this DP. Such movement would strand the possessor, as required. The unanswered question here is why NP can move out of DP in NI constructions and not in other environments, such as passive (e.g., \**Car was found the/John’s*). The other possibility would be to say that the possessor must extrapose out of the NP before the NP remnant-moves to (say) Spec, vP. The unanswered question for this variant would be why extraposition of the possessor is even possible, let alone required, given that possessor extraction is restricted or impossible in many languages (e.g. *I found –’s wallet just now [the man who is standing over there].*) Perhaps some of these unanswered questions can be answered—but the remnant movement view has some hard work to do to match a straightforward result of the head-movement view.

## 7. Conclusion

In this paper, I have reviewed four categories of data that originally led me to analyze noun incorporation in certain languages as syntactic head-movement rather than as lexical compounding. I then asked whether this data was equally well explained by any of the alternative syntactic accounts of NI and similar phenomena that have appeared in the literature more recently, including Massam’s pseudo-incorporation, van Geenhoven’s base generation, and Koopman and Szabolcsi’s remnant movement. The answer is a fairly clear no. Some of the alternatives fair better on some of the data than others, but they all leave serious unanswered questions at multiple points. I conclude that syntactic head movement still seems like the best theoretical account for noun incorporation in a nontrivial class of languages, including Mapudungun (probably also Mohawk, Mayali, and Nahuatl).

It must be emphasized, however, that the alternative theories were not proposed for Mapudungun or Mohawk, but rather for Niuean and Greenlandic. There do seem to be real empirical differences in the behavior of NI over this range of languages. For example, modifiers can “incorporate” along with nouns in Niuean but not Mapudungun, supporting a pseudo-incorporation analysis for the former but not the latter. Similarly, INs have a distinctive narrow scope indefinite reading in Greenlandic but not Mapudungun, possibly supporting a semantic incorporation analysis for the former but not the latter. A corollary of this investigation, then, is that noun incorporation constructions in different languages seem to be different enough syntactically and semantically to warrant distinct analyses. Perhaps we can be right—just not as often as we might have hoped.

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