

Head Movement and Noun Incorporation

Head movement (HM), once a mainstay of generative syntax has undergone a tumultuous series of overhauls recently (Baker, 2009, Boeckx and Stjepanović, 2001, Chomsky, 2001, Fanselow, 2003, Mahajan, 2003, respectively, Matushansky, 2006, Roberts, 2010). The problems with HM have been discussed in the literature cited above, and we do not comment further on this here. Rather, we wish to address the issue of HM and noun incorporation (NI) in light of Roberts' (2010) recent reworking of HM. In a nutshell, we show that Roberts' mechanism for HM, while well suited for capturing other properties Roberts discusses such as clitics in Romance and Slavic languages, fails to capture various properties of NI in several languages, notably Fox and Ojibwe (Algonquian) and various Northern Iroquoian languages (Mohawk, Onondaga and Oneida), though we discuss other languages below. Crucially, we do not argue that Roberts' approach for HM is on the whole untenable; we merely contend that it cannot be the right analysis of NI. This squib is organized as follows. In section 1 we present some background to HM and NI. In section 2, we present the mechanics of HM as presented in Roberts, along with Roberts' preliminary analysis of NI in Mohawk. Section 3 presents the relevant properties of NI in the languages mentioned. Section 4 discusses the problems for Roberts' proposal for HM and NI. Section 5 presents the conclusions and the implications of the current discussion for NI.

1 Background

One hold-over from the Government and Binding era is the distinction between HM and phrasal movement, which persists to this day (Aboh, 2004, Baker, 2009, Roberts, 2010).

However, with the demise of any formal distinction between X^0 and XP (Chomsky, 1995), the concept of HM was called into question (Fanselow, 2003, Koopman and Szabolcsi, 2000, Mahajan, 2003). Chomsky (2000, 2001) has suggested relegating HM to PF, but leaves open the possibility that incorporation phenomena may still be part of the overt syntax (Chomsky, 2001: 37). NI certainly cannot be a purely PF phenomenon given its semantic effects, such as frozen scope (Baker, 1996, van Geenhoven, 1998), and syntactic effects, such as on argument structure (Sadock, 1986). In response to the growing scepticism of the existence of HM, Baker (2009) has re-affirmed that HM indeed is still needed for NI, but does fail to address how NI can be implemented in a Bare Phrase Structure framework.

2 Head Movement in Roberts (2010)

Roberts recasts HM as a reflex of Agree between a Probe and a defective Goal. He takes a defective goal to be one whose features are a proper subset of the Probe. Following Roberts, we illustrate the operation with Romance clitics. Roberts assumes that an active, transitive v^* has in interpretable V-feature, $[iV]$ (to categorize the lexical root) and $[u\phi]$. Following Cardinaletti and Starke (1999) and Déchaine and Wiltschko (2002), he further assumes that a clitic is a bare ϕ P devoid of Case features – in other words a bundle of interpretable ϕ -features, $[i\phi]$. When the V - v^* complex enters into an Agree relation with the clitic, the $[u\phi]$ feature set on v^* is valued by the clitic, exhausting its feature set (Roberts, 2010, ex (30)).

- (1) a. *Trigger for Agree*
- v^* [Pers:____, Num:____] ϕ [Pers:*a*, Num :*b*]

b. Outcome of Agree

$$v^* [\mathbf{Pers:a}, \mathbf{Num:b}] \quad (\varphi[\mathbf{Pers:a}, \mathbf{Num:b}])$$

Roberts argues that there is no formal difference between Agree that exhausts all the features of the Goal on the one hand, and Move/Internal Merge of the Goal to the Probe, on the other. In other words, the outcome of (1)b, $\text{Agree}(v^*, \varphi)$ is indistinguishable from $\text{Merge}(v^*, \varphi)$ precisely because the set of features on φ is a subset of the features of v^* . HM fails with a full DP object because contains features that are not part of v^* (such as D and Case).

Roberts reviews Baker's (1996) properties of polysynthetic languages and proposes that NI can be captured under the same rubric as cliticization, thus following the tradition of Baker (1988) in treating NI as HM. Roberts considered the following example of NI in Mohawk (Baker, 1996, ex (9)).

- (2) wa'- ke- nakt- a- hninu- '
 FACT- 1.SG.SUBJ- bed- EPEN- buy- PUNC
 'I bought the/a bed.'

The relevant Probe in Mohawk (and assumedly in all languages with NI) is a v^* endowed with a D-feature, which Roberts argues arises as a result of rich object agreement. NI, then, proceeds as follows. The nominal root incorporates into a nominalizer head (N-*n*), just as V raises to v , endowing the nominal expression with an N-feature.¹ Roberts further makes the reasonable assumption that a D-feature entails an N-feature. Thus, the set of features on the Goal, $\{[N]\}$, is a subset of the features on the Probe, $\{[D], [V], [u\varphi]\}$, given that $[D]$ entails $[N]$. Roberts suggests, leaving various questions unanswered, that

once the v^* Probe enters into an Agree relation with the Goal (the incorporated nominal), the Goal necessarily incorporates since its features are a subset of the Probe's. That is, as with clitic movement above, once v^* Agrees with the N-*n* complex, the result is indistinguishable from actual movement, so incorporation ensues.

We have sketched out Roberts' analysis of HM and how it applied to NI. In the following section we go over in detail some further properties of NI and then continue to explain how they are problematic for Roberts' proposal.

3 Noun Incorporation

We present brief description of those facts of NI relevant to the current discussion concentrating mainly on Ojibwe (Algonquian) and Northern Iroquoian; however, we do introduce data from other languages where it is pertinent to the discussion (for a fuller discussion of NI, see Gerds, 1998, Massam, 2009). Consider first two examples of NI in Onondaga (Northern Iroquoian) examples (Woodbury, 1975, Woodbury, 2003).

- (3) a. waʔ- ha- yɛkw- a- hninu- ʔ
 FACT- 3.SG.M.AG - tobacco- EPEN- buy- PUNC
 'He bought tobacco.'
- b. da- khe- adogwa- ʔtsh- ɛ -ʔ
 CISLOC.FACT- I:her- spoon- NZLR- hand- PUNC
 'I handed her a spoon.'

(3)a shows a bare root incorporated into the verbal complex,² and (3)b shows a root plus nominalizer incorporated into the verbal complex. While the IN in many languages can

consist only of a bare root, it is quite common for nominalizers to appear as part of the IN complex. Ojibwe also exhibits NI with overt nominalizers.

- (4) a. N-gii-beengw-naa-**gan**-ee
 1-PAST-dry-dish-NZLR-VAI
 ‘I dried the dishes.’ (Rhodes 1976, p. 263)
- b. Gii-naa-d-bkwenzh-**gan**-e
 PAST-fetch-TR-bread-NZLR-VAI
 ‘He/she went after some bread.’ (Philomene Chegahno, 2008-05-05)

In contrast to Northern Iroquoian, however, the IN in Ojibwe can be modified.

- (5) n-gii-**gichi**-gizhebaa-wiisin
 1SG-PAST-big-breakfast-eat
 ‘I ate a big breakfast!’ (Ningewance 2004, p. 127).

Note that this is not simply a lexicalized compound. While it’s conceivable that a ‘big breakfast’ might be common enough to be stored as a whole, other modifiers that can incorporate include numerals, which strongly suggests a non-lexical source for these constructions. Furthermore, according to Sadock (1980:316), “modification of [INs] is perfectly regular in Greenlandic”.

- (6) biili-**suaq**-lior-sima-voq
 car-big-make-PAST-3SG
 ‘He has made a big car.’ (Sadock 1980:303)

In Fox, this type of incorporation can also contain nouns that are possessed. This is illustrated in (7).

(7) ne-pyätci-**ke-tānes**-awâpagā-pen

1-come.to-your-daughter-see-IMP.PL

‘We have come to see your daughter.’ (Michelson 1917:51)

In Fox, it is also possible for demonstratives to incorporate into the verb as (8) shows. On the reasonable assumption that demonstratives are Ds, then clearly they are not defective. They nevertheless can incorporate.

(8) kici- **ini**- atcimutci

after- that- narrate

‘After he narrated that.’ (Michelson 1917:51)

Finally, we illustrate NI into light verbs. This kind of NI has been studied extensively by Johns (2007) for Inuktitut. To illustrate, in (9) the noun *naboob* ‘soup’ merges with the morpheme *-ke*, a verbal form which means make, build, hunt, pick, do, etc. The verbal form has a very general meaning akin to an auxiliary and unlike a lexical verb (see Mathieu, to appear, for a full description of these denominal verbs).³

(9) Eric gii-naboob-ke-w

Eric PAST-soup-VAI-3SG.S

‘Eric was making soup.’ (Ernestine Proulx, speaker, 2007-04-19)

Ojibwe nominals in such incorporating constructions can also contain diminutive and pejorative morphology, (10), and number/gender morphology, **Error! Reference source not found.**, both showing again that the incorporated element is much larger than a root or N-*n* complex.

(10) gii-[ikwe-zhenzh-ish]-i-w

PAST-[girl-DIM-PEJ]-VAI-3SG.S

‘She was a naughty little girl.’

(11) [makw-a]-ke-w

bear-NUM/GEN-VAI-3SG.S

‘He/she is hunting bears.’

To sum up, we have shown that NI constructions can incorporate material beyond a nominal root and a nominalizer. In particular, it was shown that the IN could be modified by adjectives or could appear with additional inflectional material such as number or possessive markers.

4 Problems with Roberts (2010)

Given that Roberts (2010) is the most viable solution to the problems of HM on the market, it behoves us to examine the ramifications of this proposal for NI. As it turns out, there are several problematic aspects of Roberts’ account of NI. Recall that for NI to proceed as HM, it is crucial that the IN not be distinct from the Probe, v^* and that v^* consist of active object agreement to licence the incorporation of nominal material. Crucially, we find cross-linguistically that NI involves both (i) incorporation of distinct material, and (ii) NI with lack of object agreement.

The facts concerning NI in Ojibwe presented above are problematic as they include material not contained in the feature make-up of the v^* Probe. The IN cannot be said to be a clitic (a defective element) since unlike a clitic it is perfectly capable of appearing separately from the verb. If we follow Roberts (2010), one could argue that

such nouns are formed via the merging of a nominal root, *N*, with *n* and that it is this *N-n* complex that merges with the lexical verb. However, INs in such contexts can be modified as shown in **Error! Reference source not found..**

Consider also NI in Chukchi, where both a noun and its modifier can incorporate (Spencer, 1995). Consider the following example (Spencer (p. 481), citing Skorik, 1961, 103)

- (12) *tə- wel- ənnə- tke- rkən*
 1.SG.SUBJ- rotten- fish- smell- PRS

‘I smell of rotten fish.’

Again, the IN contains an adjectival modifier, thereby failing to satisfy the criterion for defectiveness required by Roberts’ mechanism for HM.

The following final case shows the same result with a different kind of construction. Adverb incorporation (AdvI) is found in a variety of languages, including Greek (Alexiadou, 1997, Rivero, 1992). Consider the following minimal pair (Alexiadou, 1997: 179). In the non-AdvI form, the free-standing adverbial is marked with adverbial morphology. In the AdvI form, the lexical root appears with a linking vowel (Ralli, 2003).

- (13) a. *O Janis ferete kal-a*
 DET John behaves well-ADV

‘John behaves well.’

- b. *O Janis kal-o-ferete*
 DET John well-LINK-behaves

‘John behaves well.’

Ralli suggests that the linking vowel may be a morphological element present in compounds. If so, this root+LINK combination is not a defective Goal in Roberts' terms as it contains whatever features are present on the linker that are not present in the Probe, v^* .

A clearer case of AdvI with additional functional material comes from Blackfoot (Algonquian). Consider the following example, where the incorporated adverb appears with a degree word.

- (14) ann-wa John iik-Ikkam-iy-owat-si ann-yi-hka-yi apastaminam
DET-PROX John DEG-fast-?-eat-MOOD DET-OBV-INVIS-SG apple
'John ate that apple very quickly.' (Beatrice Bullshields, speaker)

Next, we turn to the issue of lack of object agreement. For Roberts, it is crucial that object agreement is found on the v^* Probe in order to ensure non-distinctness on the Goal, the incorporated nominal. It is well known that Northern Iroquoian languages have robust subject and object agreement. However, Northern Iroquoian languages typically lack any kind of agreement with inanimate objects (Koenig and Michelson, 2008). Transitive forms exhibit both subject and object agreement that does not vary with aspect. Intransitive forms typically have subject agreement with their single argument (although there are many lexical exceptions) in non-perfective aspects and object agreement in the perfective (STAT in Iroquoianist terms) (Lounsbury, 1949). Consider the following example with NI.

- (15) ak- atənaʔt-shR- a- hninó- h
1.SG.ACC- groceries- NZLR- EPEN- buy- STAT
'I have bought groceries.' (Woodbury, 2003)

The fact that the notional subject of the sentence is referenced by object agreement shows that this sentence is morphosyntactically intransitive. If there were a phonologically null agreement marker referencing the object, then we would expect subject agreement on the subject.

Consider finally the following example of possessor raising (see Michelson, 1991 for more details). Here, verbal agreement references the notional subject and the possessor, but not the incorporated nominal. Northern Iroquoian languages can reference a maximum of two arguments. Since both agreement markers are used up by other arguments, the incorporated nominal as a consequence cannot be referenced by any agreement marker.

- (16) waʔ- khe- neʔsh- ohae- ʔ neʔ Mary
 FACT- 1.SG.SUBJ:3.SG.F.OBJ- arm- wash- PUNC NE Mary
 ‘I washed Mary’s arm.’

To sum up, this section has provided numerous illustrations of incorporation of non-defective material, such as adverb incorporation and NI with modifiers forming part of the incorporated element. This section has also showed that agreement in Northern Iroquoian is in complementary distribution with NI (as originally argued in Baker, 1996). Both of these conclusions are fatal to Roberts’ HM analysis of NI.

5 Conclusion

The role of HM in syntactic theorizing continues to play an active and dynamic role. Roberts (2010) offers an innovative and viable solution to many of the problems raised by HM in UG. When applied rigorously to NI, however, many insurmountable problems

arise. It is crucial for Roberts' mechanism of HM that the formal features of the Goal be a subset of those of the Probe. What Roberts argues allows NI is the presence of a [D] feature on the v^* Probe, which is present as a result of rich object agreement in languages with NI. The [D] feature entails an [N] feature, found on the incorporated nominal (the Goal), thereby ensuring non-distinctness on the Goal. We showed that numerous languages with productive NI are capable of incorporating distinct material such as adjectives that modify that incorporated nominal (Ojibwe, Chukchi) and adverbs (Chukchi, Greek, Blackfoot). Furthermore, we also showed that in Northern Iroquoian, the requisite object agreement was crucially absent in NI constructions, or, if present, did not agree with the incorporated nominal, but rather with another argument.

Although NI has a long tradition of being analyzed as HM (Baker, 1988), the recent discussions mentioned at the beginning of this squib have sparked serious reconsiderations of HM. Although Roberts has proposed a viable and coherent solution to many of the problems associated with HM, we have clearly shown that this solution will not work for NI. We suggest, then, that other avenues must be pursued in the analysis of NI, such as XP movement (Mathieu, 2008) or roll-up movement (Barrie, 2010).

References

- Aboh, Enoch. 2004. Snowballing Movement and Generalized Pied-piping. In *Triggers*, eds. Anne Breitbarth and Henk Van Riemsdijk, 15-48. The Hague: Mouton de Gruyter.
- Alexiadou, Artemis. 1997. *Adverb Placement: A Case Study in Antisymmetric Syntax*. Amsterdam: John Benjamins.

- Baker, Mark C. 1988. *Incorporation: A Theory of Grammatical Function Changing*. Chicago, IL: University of Chicago Press.
- Baker, Mark C. 1996. *The Polysynthesis Parameter*. Oxford: Oxford University Press.
- Baker, Mark C. 2009. Is head movement still needed for noun incorporation? *Lingua* 119:148-165.
- Barrie, Michael. 2010. Noun Incorporation as Symmetry Breaking. *Canadian Journal of Linguistics* 55:273-301.
- Boeckx, Cedric, and Stjepanović, Sandra. 2001. Head-ing toward PF. *Linguistic Inquiry* 32:345-355.
- Cardinaletti, Anna, and Starke, Michal. 1999. The typology of structural deficiency: On the three grammatical classes. In *Clitics in the Languages of Europe*, ed. Henk Van Riemsdijk, 145-233. Berlin: Mouton de Gruyter.
- Chomsky, Noam. 1995. Bare Phrase Structure. In *Government and Binding Theory and the Minimalist Program: Principles and Parameters in Syntactic Theory*, ed. Gert Webelhuth, 383-439. Oxford: Blackwell.
- Chomsky, Noam. 2000. Minimalist Inquiries: The Framework. In *Step by Step: Essays on Minimalist Syntax in Honor of Howard Lasnik*, eds. Roger Martin, D. Michaels and Juan Uriagereka, 89-156. Cambridge, MA: MIT Press.
- Chomsky, Noam. 2001. Derivation by Phase. In *Ken Hale: A Life in Language*, ed. Michael Kenstowicz, 1-52. Cambridge, MA: MIT Press.
- Déchaine, Rose Marie, and Wiltschko, Martina. 2002. Decomposing Pronouns. *Linguistic Inquiry* 33:409-442.

- Fanselow, Gisbert. 2003. Münchhausen-Style Head Movement and the Analysis of Verb Second. *UCLA Working Papers in Linguistics* 13:40-76.
- Gerdts, Donna B. 1998. Incorporation. In *The Handbook of Morphology*, eds. Andrew Spencer and Arnold M. Zwicky, 84-100. Malden, MA: Blackwell.
- Johns, Alana. 2007. Restricting noun incorporation: root movement. *Natural Language and Linguistic Theory* 25:535-576.
- Koenig, Jean-Pierre, and Michelson, Karin. 2008. Revisiting the realization of arguments in Iroquoian. Paper presented at *Annual Meeting of the Linguistic Society of America*, Chicago, IL.
- Koopman, Hilda, and Szabolcsi, Anna. 2000. *Verbal Complexes*. Cambridge, MA: MIT Press.
- Lounsbury, Floyd Glenn. 1949. Iroquoian Morphology, Yale University: Ph.D. Dissertation.
- Mahajan, Anoop. 2003. Word Order and (Remnant) VP Movement. In *Word Order and Scrambling*, ed. Simin Karimi, 217-237. Malden, MA: Blackwell Publishers.
- Massam, Diane. 2009. Noun Incorporation: Essentials and Extensions. *Language and Linguistics Compass* 3:1076-1096.
- Mathieu, Éric. 2008. Word formation as phrasal movement: evidence from Ojibwe. Paper presented at *NELS 39*, Cornell University.
- Mathieu, Éric. to appear. Denominal Verbs in Ojibwe. *International Journal of American Linguistics*.

- Matushansky, Ora. 2006. Head Movement in Linguistic Theory. *Linguistic Inquiry* 37:69-109.
- Michelson, Karin. 1991. Possessor Stranding in Oneida. *Linguistic Inquiry* 22:756-761.
- Ralli, Angela. 2003. Morphology in Greek Linguistics. *Journal of Greek Linguistics* 4:77-129.
- Rivero, Maria-Luisa. 1992. Adverb Incorporation and the Syntax of Adverbs in Modern Greek. *Linguistics and Philosophy* 15:289-331.
- Roberts, Ian. 2010. *Agreement and Head Movement: Clitics, Incorporation, and Defective Goals*. Cambridge, MA: MIT Press.
- Sadock, Jerrold. 1986. Some Notes on Noun Incorporation. *Language* 62:19-31.
- Skorik, Pjotr. 1961. *Grammatika čukostogo jazyka, tom 1 [The Grammar of Chukchi, vol 1 (in Russian)]*. Moscow: Izdatel'stvo Akademii Nauk.
- Spencer, Andrew. 1995. Incorporation in Chukchi. *Language: Journal of the Linguistic Society of America* 71:439-489.
- van Geenhoven, Veerle. 1998. *Semantic Incorporation and Indefinite Descriptions: Semantic and Syntactic Aspects of Noun Incorporation in West Greenlandic: Dissertations in Linguistics. (DiLi)*. Stanford, CA. Stanford, CA: Center for the Study of Language and Information.
- Woodbury, Hanni. 1975. Onondaga Noun Incorporation: Some Notes on the Interdependence of Syntax and Semantics. *International Journal of American Linguistics* 41:10-20.

Woodbury, Hanni. 2003. *Onondaga-English/English-Onondaga Dictionary*. Toronto, ON: University of Toronto Press.

¹ Note that it is this very property of NI in Northern Iroquoian that is problematic for Baker's (2009) recent HM approach. There, Baker argues that movement of a lexical head to a functional head and then back to a lexical head is barred. This is precisely the kind of movement that Roberts argues takes place in NI.

² Note that the epenthetic vowel (called a joiner vowel in the Iroquoianist literature) is present merely to break up the illegal consonant cluster. It is not a morpheme.

³ This type of construction is often called a "denominal verb construction". However, this term is misleading because the construction is very much like noun incorporation. It is very different from denominal verb formation in English (see Mathieu, to appear, for details). It shares many properties with traditional noun incorporation (referentiality of the noun, stranding of modifiers, etc.).