

A Minimalist Analysis of Noun Incorporation

Anke Assmann Doreen Georgi Philipp Weisser
 lg_anke@gmx.de georgi@uni-leipzig.de phweisser@gmx.de

1 Introduction

CLAIMS:

Baker's (1988) idea of analyzing incorporation as head movement can be recycled despite obvious technical problems caused by a change from a GB to a minimalist framework.

Baker's (1988) misses to capture the whole agreement pattern of noun incorporation in Mohawk. This pattern can be derived in a minimalist framework.

1.1 GF changing processes

GRAMMATICAL FUNCTIONS ARE:

- defined as sets of properties, different subtheories interact (X-bar theory, Case theory, ...)
- (and therefore) derived notions

GF CHANGING PROCESSES:

- An NP that has a certain grammatical function F in the context of a verb with a certain morphology M receives another grammatical function F' in the context of a verb with a different morphology M'. But both are still thematic paraphrases.

- (1) a. Rover bit Linda.
 b. Linda was bitten by Rover (Baker, 1988, 7)

- (2) *Mohawk*:
 a. Ka-rakv ne sawatis hrao-nuhs-a?
 3N-be.white DET John 3M-house-SUF
 'John's house is white.' (Baker, 1988, 97)

- b. Hrao-nuhs-rakv ne sawatis.
 3M-house-be.white DET John
 'John's house is white.' (Baker, 1988, 96)

- The possessor in (2-b) behaves like the DO in (2-a): it triggers φ -agreement on the verb.

1.2 Baker (1988)

BAKER'S AIM:

- To develop a unified and restrictive analysis for all GF changing processes

- To derive restrictions by the interaction of independently motivated principles of grammar

BAKER'S PROPOSAL:

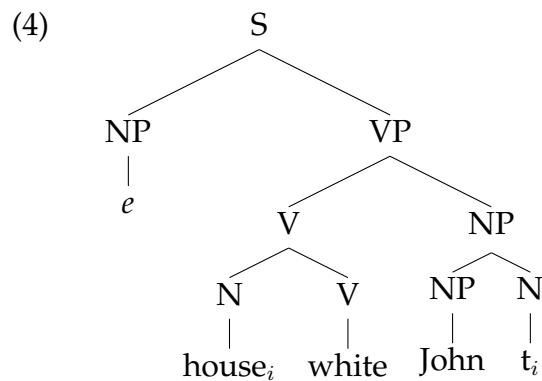
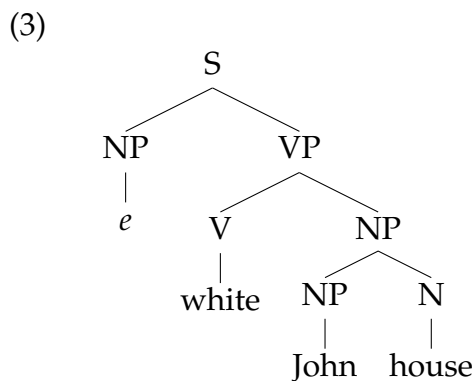
- All GF changing processes are derived by incorporation which is analysed as head movement. GF changing is a side effect of this movement. As an instance of Move α , X^0 movement is subject to the same constraints as XP movement. This derives many of its properties (distribution of incorporation, morphological reflexes, (im)possible GF changing processes, order of GF changing processes ...).

"I claim that the heart of all apparent GF changing processes is the movement of a word or (more technically) a lexical category. This I refer to as X^0 movement ..."

(Baker, 1988, 19)

INCORPORATION BY HEAD MOVEMENT:

- UTAH: The sentences in (2) must have the same underlying structure.
- (2-b) must be derived from (2-a) by movement of N^0 to V^0 (head adjunction).
- Projection Principle: Movement of N^0 must leave a trace.
- Traces are subject to the ECP: A trace must be properly governed by its antecedent.



GF CHANGING BY INCORPORATION

- GF relations *without* incorporation:
NP is the DO of V in (2-a): V governs NP and N^0 , but nothing else contained in NP, e.g. the possessor.
- GF relations *with* incorporation:
The possessor behaves like the DO of V in (2-b), i.e., V must govern the possessor, i.e. government relations must be changed by incorporation.

After NI, NP is no longer a barrier, due to the definition of the ECP. Consequence: GTC

- (5) *The Government Transparency Corollary:*
A lexical category which has an item incorporated into it governs everything which the incorporated item governed in its original structural position.

1.3 Noun Incorporation in Mohawk

MAIN GENERALIZATION OF NI IN MOHAWK:

If NP has *no* possessor, there is *always* agreement between the verb and the head noun regardless of whether incorporation occurs or not (cf. (6)).

If NP has *a* possessor,
either the verb agrees with the head and the noun with the possessor and there is no incorporation (cf. (7-a))
or the verb agrees with the possessor, the head noun *does not* agree with the possessor and the head noun is incorporated into the verb. (cf. (7-b))

(6) *Examples without a possessor:*

- a. Yao-wir-a?a ye-nuhwe?-s ne ka-nuhs-a?
 PRE-baby-SUF **3FS/3N**-like-ASP the PRE-house-SUF
 ‘The baby likes the house.’
- b. Yao-wir-a?a ye-nuhs-nuhwe?-s
 PRE-baby-SUF **3FS/3N**-house-like-ASP
 ‘The baby likes the house.’

(Baker, 1988, 81-82)

(7) *Examples with a possessor:*

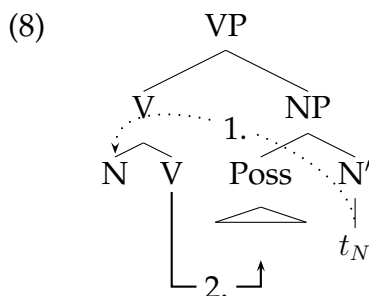
- a. I?i k-ohres ne i?i wak-nuhs-a?
 I 1SS/**3NO**-wash DET I 1S-house-SUF
 ‘I washed my house’
- b. Wa-hi-?sereht-anvhsko
 PAST-3MS/**1SO**-car-steal
 ‘He stole my car’

(Baker, 1988, 101)

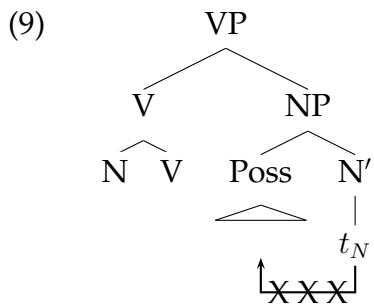
(Baker, 1988, 98)

1.4 Problems of Baker’s analysis of NI in Mohawk

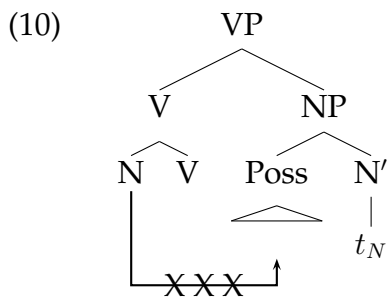
1. Baker has to *stipulate* that incorporation precedes case assignment. (Incorporation and case assignment/agreement take both place at S-structure.)



2. Baker has to *stipulate* that traces cannot assign case. (After N has incorporated into V, it can no longer assign case to Poss.)



3. Baker has to *stipulate* that N cannot assign case after incorporation (*Case Frame Preservation Principle*).



- (11) *Case Frame Preservation Principle*:
 A complex X^0 of category A in a given language can have at most the maximal case assigning properties allowed to a morphologically simple item of category A in that language.

4. Baker cannot naturally account for the fact that agreement between V and N and incorporation co-occur in absence of a possessor but not in presence of a possessor.

2 Problems for NI in Minimalist Syntax

CENTRAL ASSUMPTIONS IN MINIMALISM (CHOMSKY (1995, 2000, 2001, 2008)):

- Incremental structure building, no distinct levels of representation
- No look-ahead; all operations must be in accordance with the Strict Cycle Condition
- *Earliness Principle*, cf. Pesetsky (1989): all operations apply as soon as possible.
- All operations (Merge, Move, Agree) are feature-driven ([\bullet F \bullet] for Merge, [\ast F \ast] for Agree).

CENTRAL QUESTION:

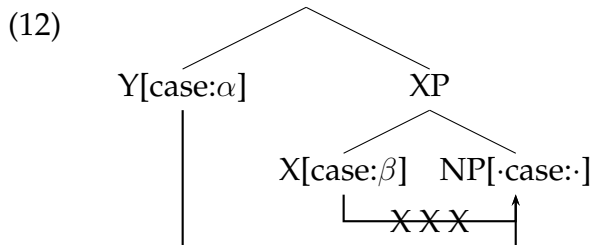
How is it possible to derive the same facts as Baker did using a strictly derivational syntax that obeys the Strict Cycle Condition and allows no look-Ahead?

AN ARGUMENT FOR D-STRUCTURE?:

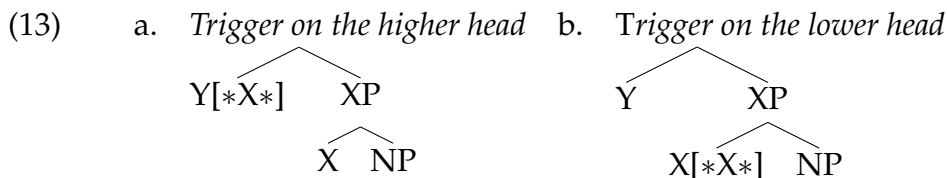
“The status of D-structure [...] has been attacked from many perspectives. Lexical-Functional Grammar, Generalized Phrase Structure Grammar, and others dispense with such a level entirely, and GB theorists have explored the possibility of deriving it from S-Structure [...]. *Such approaches will be hard pressed to replicate or supersede the explanatory results of this work in terms of lexical rules, linguistic metarules, or chain formation algorithms, without losing the essence and/or the elegance of the claim that there are no transformations that map syntactic structures onto other syntactic structures. Thus, the existence and importance of D-Structure as a level of linguistic representation is reestablished by the theory of Incorporation.*”
 (Baker, 1988, 428)

THEORETICAL ISSUES:

1. Unless case assignment cannot be postponed anymore (*Earliness Principle*), we need to find a way to make sure that an NP that usually receives case from head X can receive case from a higher head Y which is the goal of incorporation.



2. Since all operations are feature-driven, we need to find a *trigger* for incorporation. The difficulty here is in the location of the incorporation-triggering feature. There are two possibilities:



EMPIRICAL ISSUES:

3. How is it possible to account for the agreement pattern in Mohawk NI?

3 A Solution

MAIN AIM:

The aim is to develop a *minimalist account of incorporation* that recycles Baker's idea that incorporation is head movement.

ASSUMPTIONS:

- Standard Minimalist Assumptions, see above.
- Probe-Goal framework of *Agree* (Chomsky (2000, 2001))

(14) *Agree* (P, G):

If

- a. P c-commands G
- b. P has a feature [$*F^*$] and G has a matching feature F
- c. G is the closest matching goal for P.

and

- d. G is active due to a feature [$\cdot M \cdot$] and P has a matching feature [M]

Then [$*F^*$] on P gets checked and deleted and [$\cdot M \cdot$] on G gets checked and deleted.

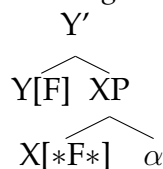
- Following Heck (2010), the *closest possible goal* of a probe on a head H are matching features on H.

(15) $H [*F^*, F] \longrightarrow H [*F^*, F]$

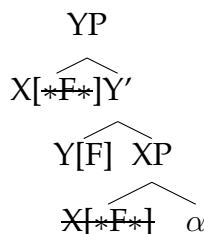
- *Head Movement* is the same as phrasal movement (cf. Matushansky (2006)). In contrast to Matushansky (2006), we assume that the difference between phrasal movement and head movement is not the difference between *Agree* and C-Selection but the location of the trigger, i.e. head movement of a head H is triggered by a feature [$*F^*$] on the very same head H (cf. Fanselow (2002); Georgi and Müller (2010)).

(16) *Head movement*

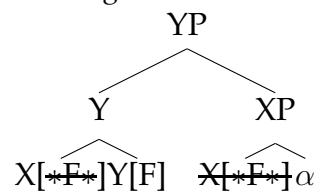
a. *Starting Point*



b. *Move*

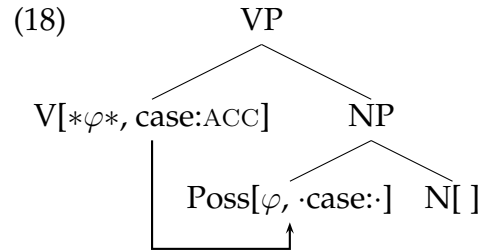
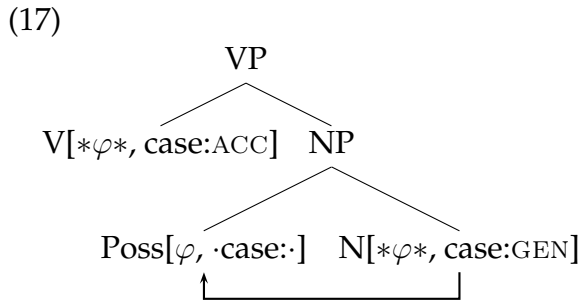


c. *M-merger*



- *Case* assignment on heads is an *optional* property. (This assumption is intuitive especially for nouns since nominal arguments are optional.)

This assumption solves the first problem in section 2. The head noun assigns no case and does therefore not agree with the possessor, i.e., the possessor remains active for Agree with V.



- The feature that triggers incorporation is [**CASE**]. This case feature differs from simple case features [*·case·*] in that it cannot be discharged as a by-product of Agree but must c-command a case assigner and does not need a case value. Only one case feature can occur on a head at the same time.

- (19)
- N[*·case·*, ...]
 - N[*·case·*, case:GEN, ...]
 - N[**CASE**, ...]
 - N[**CASE**, case:GEN, ...]

This assumption solves the second and third problem in section 2. We have found a *trigger* for incorporation and since the closest possible goal of a probe P is P itself, the [**CASE**]-feature on N is immediately discharged if N is a case assigner, i.e. *a head that will be incorporated can never assign case or a head that assigns case can never be incorporated.*

NOTE:

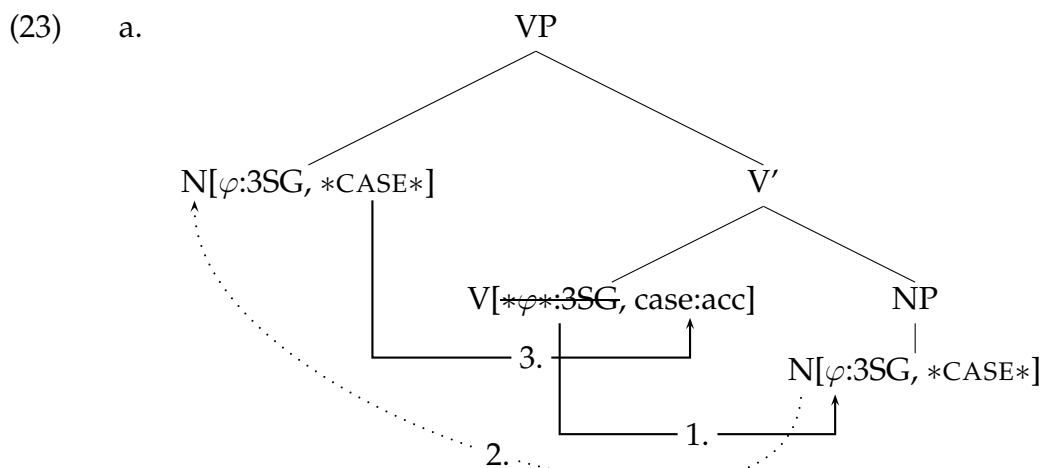
- The assumption of having two different case features seems to be stipulative at first but can be seen as development of the idea that we have different types of case features which have *different locality requirements*.

- (20) *Long-Distance Case Assignment:*
 Em Beirute, ficaram ontem [esses soldados sem armas].
 in Beirut became yesterday those soldiers without guns
 (Raposo and Uriagereka, 1990, 509)

- (21) *Case Assignment under Adjacency:*
 a. Poirot speaks English fluently.
 b. *Poirot speaks fluently English. (Haegeman, 1994, 178)

- (22) *Case Assignment under structural identity:*
 Suulut timmisartu-lior-poq
 Søren.ABS airplane-make-3sS
 'Søren made an airplane.' (Baker, 1988, 126)

THE DERIVATION OF NI IN A NUTSHELL¹:



8 CASES:

- Since we assume that having a [*CASE*]-feature, being a case assigner and having a possessor are prima facie independent properties of nouns, we have to consider three different parameters encoded in presence or absence of features on N:

- (24) *3 binary Parameters:*
 a. Possessor vs. no Possessor ([•N•])
 b. Incorporation feature vs. no incorporation feature ([*CASE*])
 c. φ-probe vs. no φ-probe ([case:GEN])

- The three parameters yield 8 possible cases.

(25) *2³ cases:*

	PossP?	[case:gen]?	[*CASE*]?	Attested Pattern?
Case I	-	+	-	-
Case II	-	+	+	-
Case III	-	-	-	+
Case IV	-	-	+	+
Case V	+	-	-	-
Case VI	+	-	+	+
Case VII	+	+	-	+
Case VIII	+	+	+	-

- All cases marked with “-” for “Attested pattern” are supposed to crash, while all cases marked with “+” should converge.

¹We assume that nominal arguments are NPs and not DPs. For arguments in favour of a NP-over-DP analysis see e.g. Georgi and Müller (2010).

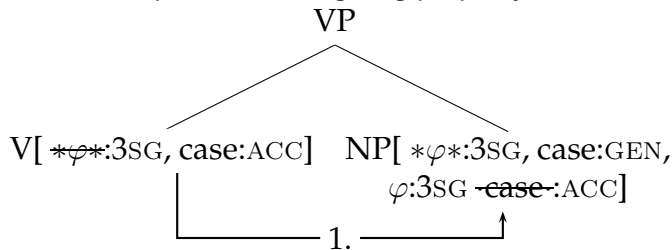
4 Derivations

4.1 NPs *without* Possessors

CASE I:

- The derivation crashes because N's φ -probe cannot be checked.

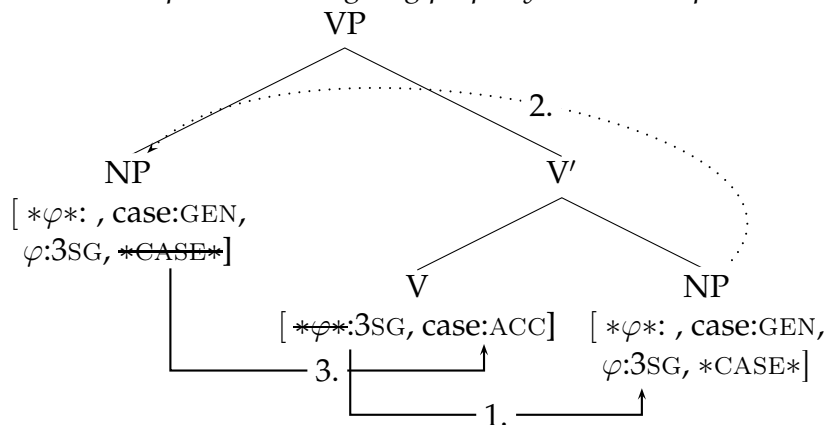
(26) *Case I: no poss, case assigning property on N, no incorp



CASE II:

- The derivation crashes because N's φ -probe cannot be checked. (The same reason as for case I.)

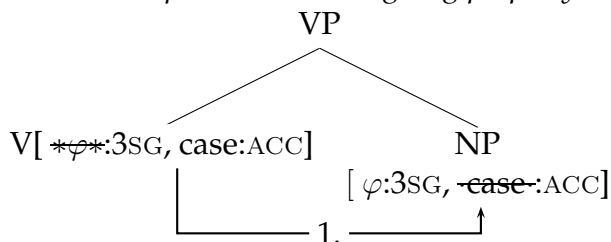
(27) *Case II: no poss, case assigning property on N, incorp



CASE III:

- The derivation converges with V agreeing with N.

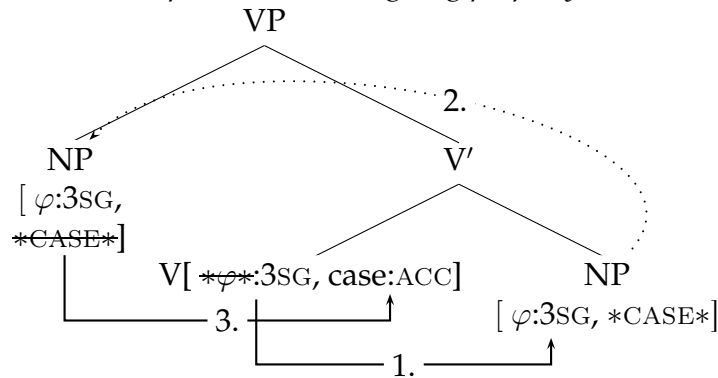
(28) Case III: no poss, no case assigning property on N, no incorp



CASE IV:

- The derivation converges. First, V agrees with N. Next, since the case feature of N could not get checked in the first instance of Agree, N moves to Spec,VP where N's case feature can get checked.

(29) *Case IV: no poss, no case assigning property on N, incorp*

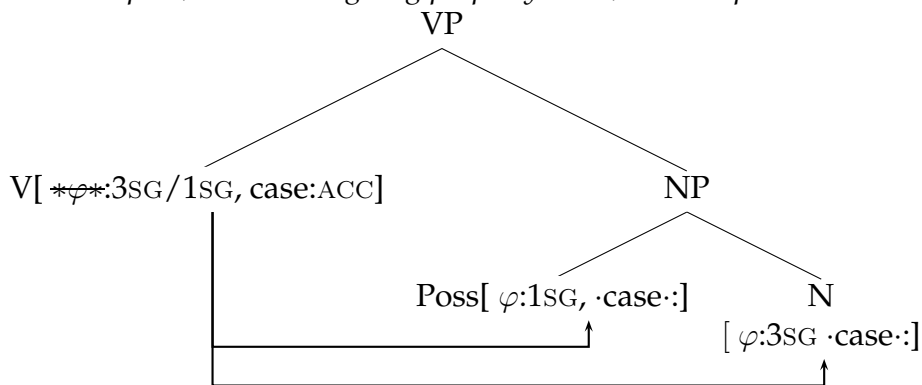


4.2 NPs *with* Possessors

CASE V:

- The derivation crashes since one case feature cannot get checked (either Poss’s one or N’s one).²

(30) **Case V: poss, no case assigning property on N, no incorp:*



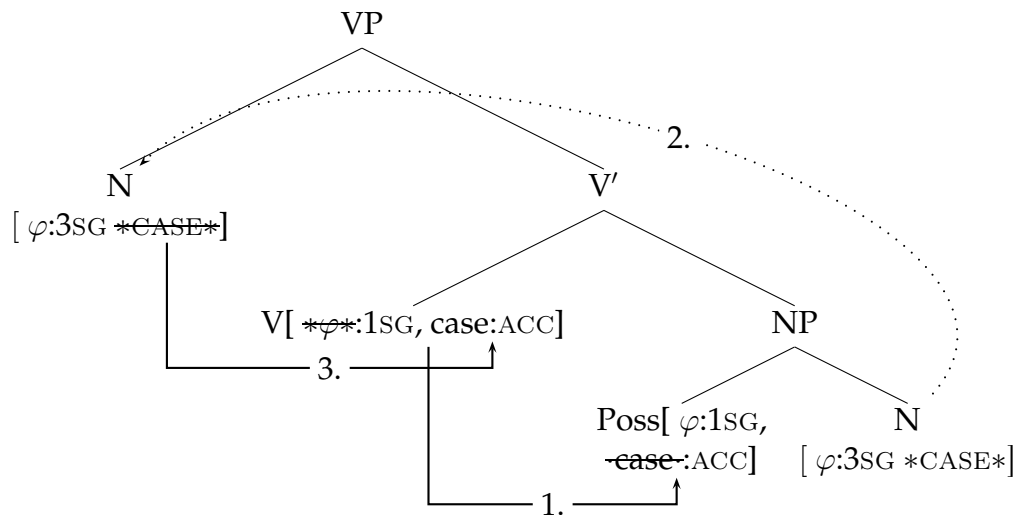
CASE VI:

- The derivation converges. There is no Agree between N and Poss since N is not a case assigner. Thus, Poss remains active for Agree with N. Poss’s case feature gets checked by agreement with V while N’s case feature gets checked by movement to Spec,VP plus agreement with V.³

(31) *Case VI: poss, no case assigning property on N, incorp:*

²Note that we assume a minimalist syntactic structure which only contains necessary branches. Therefore N and Poss could be considered equi-distant to V or Poss could be closer to V under certain assumptions (see e.g. Roberts (2010)). The discussion of this issue is, however, orthogonal to our problem.

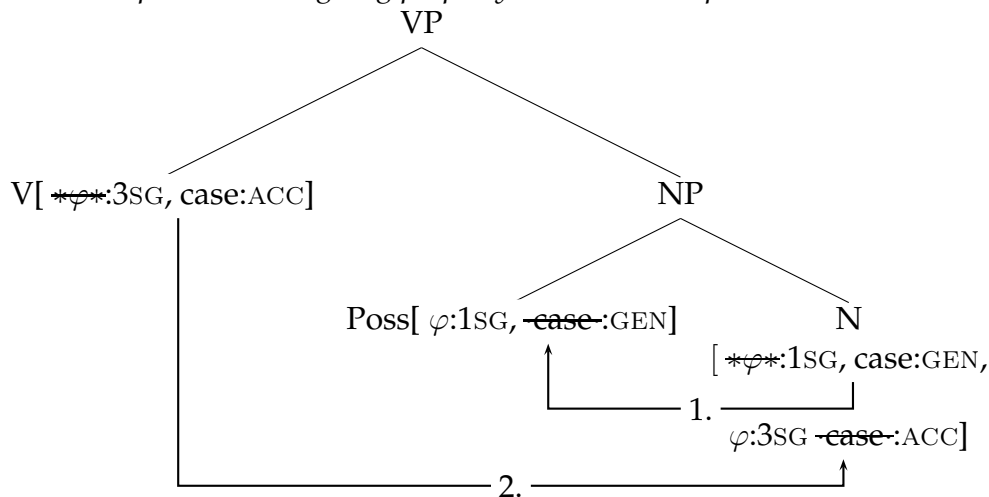
³Note that V might agree with N as well, yielding the same agreement pattern as in Case IV. In this option, Poss would keep an unchecked case feature causing the derivation to crash. However, since there is one converging derivation, namely (i), case VI should be an attested pattern.



CASE VII:

- The derivation converges. N assigns case to Poss at a point where V has not entered the derivation yet. After entering the derivation, V agrees with N.

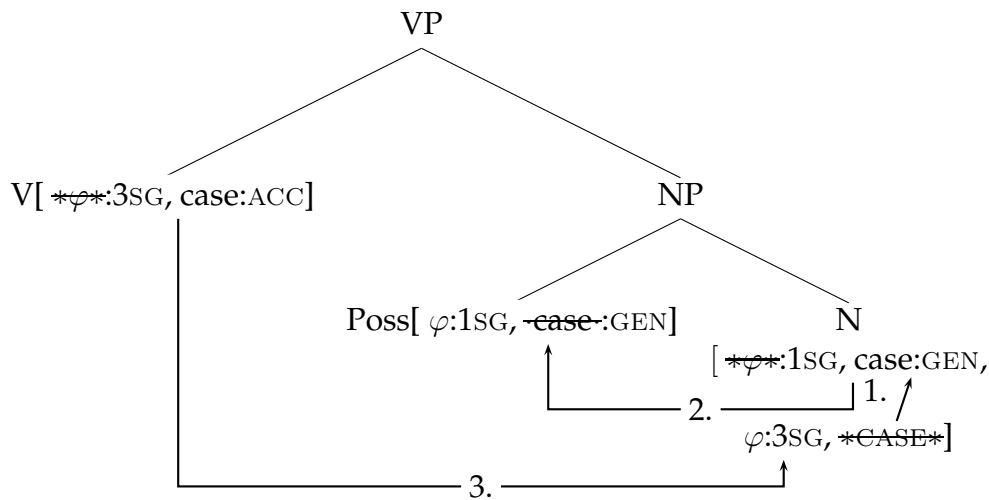
(32) Case VII: poss, case assigning property on N, no incorp:



CASE VIII:

- The derivation converges. However, since N has a probing [*CASE*]-feature and is a case assigner, the [*CASE*]-feature gets deleted before N can merge with anything else. After merging Poss, N agrees with Poss and later, V agrees with N. Note that the derivation looks like case VII in (32).

(33) Case VIII: poss, case assigning property on N, incorp



EMPIRICAL OUTCOME:

- All the data of Mohawk could be captured within our approach. Only the attested patterns have converging derivations.

(34) 2^3 cases:

	PossP?	[case:gen]?	[*CASE*]?	Attested Pattern?	Crash?
Case I	-	+	-	-	+
Case II	-	+	+	-	+
Case III	-	-	-	+	-
Case IV	-	-	+	+	-
Case V	+	-	-	-	+
Case VI	+	-	+	+	-
Case VII	+	+	-	+	-
Case VIII	+	+	+	-	- (conv. with case VII)

5 Conclusion

PROBLEMS SOLVED:

- Baker’s ideas can be translated into a minimalist (i.e. derivational, strictly cyclic) framework. Therefore, Baker’s claim that different levels of representation are necessary is refuted.
- The theoretical problems (timing problem, trigger problem) in section 2 are solved.
- The generalization of NI in Mohawk could be captured due to our assumptions made above.

BAKER’S PROBLEMS REVISITED:

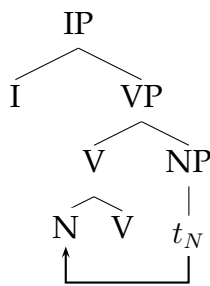
- Baker had to stipulate that incorporation precedes case assignment. In our approach, *no such extrinsic ordering* of operations is necessary.
- Baker had to stipulate that traces cannot assign case. Since in our analysis the moved head noun has never been a case assigner, we are not forced to stipulate that traces cannot assign case.

- Baker had to stipulate the *Case Frame Preservation Principle*. This principle follows elegantly from our assumption that case assignment on N is optional and cannot co-occur with incorporation.

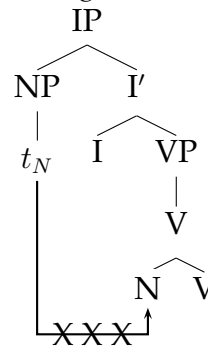
OUTLOOK:

- In all the examples seen above, the incorporated noun precedes the verbal root. This is expected under our account assuming the Linear Correspondence Axiom (Kayne (1994)). If head movement has a landing-site in specifier position, it should precede the head.
- Baker has noticed the fact that if a language allows NI into intransitive verbs, they must be unaccusative. He assumes that the only argument of unaccusative verbs is underlyingly an internal argument while it is external with unergative verbs. Since movement cannot be downwards, only unaccusative verbs should allow incorporation.

(35) *Unaccusative verbs*

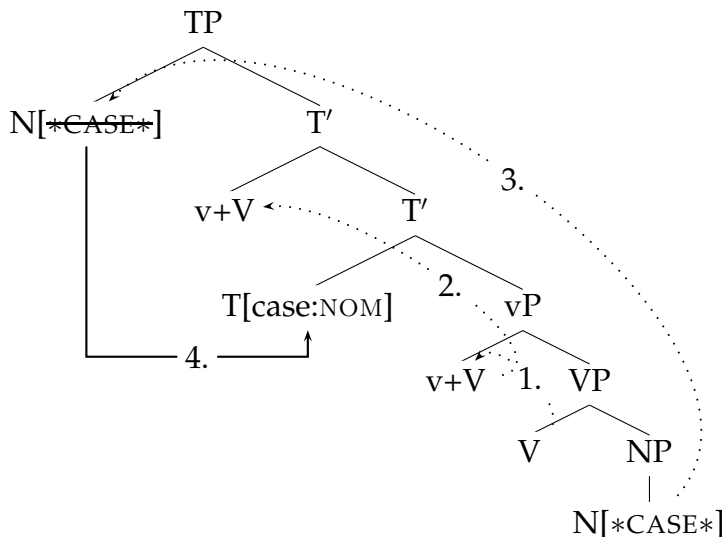


(36) *Unergative verbs*



- Assuming that Baker's structural analysis of intransitive verbs is right, we would predict, that the only argument of unaccusative verbs moves to Spec,TP which assigns nominative case. Incorporation of V to v and v+V to T is an independent step.

(37) *Unaccusative verbs*



NOTE:

- Assuming two functional projections above V (v and T) instead of only one projection (I), unergative verbs are expected to show NI as well. (The subject of unergative verbs is base-merged in Spec,vP and incorporates into T as well.) Thus, Baker can only derive this fact because he assumes no additional functional projection.

- The analysis can in principle be transferred to other types of incorporation such as causative constructions ((38)) or applicatives ((39)).

(38) *Chichewa*

a. Mtsikana ana-chit-its-a kuti mtsuko u-**gw**-e.
 girl AGR-do-make-ASP that waterpot AGR-**fall**-ASP
 ‘The girl made the waterpot fall.’

b. Mtsikana anau-**gw**-ets-a mtsuko.
 girl AGR-**fall**-made-ASP waterpot
 ‘The girl made the waterpot fall.’

(Baker, 1988, 148)

(39) a. Mbidzi zi-na-perek-a msampha **kwa** nkhandwe.

zebras SP-PAST-hand-ASP trap **to** fox
 ‘The zebras handed the trap to the fox.’

b. Mbidzi zi-na-perek-**er**-a nkhandwe msampha.
 zebras SP-PAST-hand-**to**-ASP fox trap
 ‘The zebras handed the fox the trap.’

(Baker, 1988, 229)

- All types of heads that show incorporation are case assigners. Therefore, the same assumptions should be able to account for causativization, applicativization and maybe even passive (see (Baker, 1988, ch. 6), Baker et al. (1989)).

References

- Baker, Mark C. (1988), *Incorporation: A theory of grammatical function changing*, University of Chicago Press Chicago.
- Baker, Mark, Kyle Johnson and Ian Roberts (1989), 'Passive arguments raised', *Linguistic Inquiry* 20(2), 219–251.
- Chomsky, Noam (1995), *The minimalist program*, MIT Press.
- Chomsky, Noam (2000), Minimalist inquiries, in D. M. Martin, Roger and J. Uriagereka, eds, 'Step by step: Essays on minimalism in honor of Howard Lasnik', MIT Press, pp. 89–155.
- Chomsky, Noam (2001), Derivation by phase, in M. Kenstowicz, ed., 'Ken Hale: A Life in Language', MIT Press, pp. 1–52.
- Chomsky, Noam (2008), On phases, in C. P. O. Robert Freidin and M. L. Zubizarreta, eds, 'Foundational Issues in Linguistic Theory. Essays in Honor of Jean-Roger Vergnaud', MIT Press, pp. 133–166.
- Fanselow, Gisbert (2002), Münchhausen-style head movement and the analysis of verb second, in 'A. Mahajan, Hg., Proceedings of the Workshop on Head Movement. Los Angeles: UCLA, Linguistics Department'.
- Georgi, D. and G. Müller (2010), 'Noun-Phrase Structure by Reprojection', *Syntax* 13(1), 1–36.
- Haegeman, Liliane M.V. (1994), *Introduction to government and binding theory*, Wiley-Blackwell.
- Heck, Fabian (2010), 'Categories, recursion and bare phrase structure', GGS 2010. Ms.
- Kayne, Richard (1994), *The Antisymmetry of Syntax*, MIT Press.
- Matushansky, Ora (2006), 'Head movement in linguistic theory', *Linguistic Inquiry* 37(1), 69–109.
- Pesetsky, David (1989), 'The earliness principle', Ms.
- Raposo, Eduardo and Juan Uriagereka (1990), 'Long-distance case assignment', *Linguistic Inquiry* 21(4), 505–537.
- Roberts, Ian (2010), *Agreement and Head Movement: Clitics, Incorporation, and Defective Goals*, MIT Press.