

Where There is Fire There is Smoke.  
Local Modelling of Successive-Cyclic Movement

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## Abbreviations

ACC	accusative	NSG	non-singular
AFF	affirmative	NUM	number
AG	agent, actor	OBJ	object case
AGR	agreement	OBL	oblique
ARG	argument	P	person (abbreviation in trees)
ASP	aspect	PASS	passive
ASSR	assertive	PAT	patient
AUX	auxiliary	PERF	perfect
CL	class marker	PERS	person
COMP	complementiser	POSS	possessive
CON	continuative	PL	plural
COND	conditional	PP	pronominal prefix
COP	copula	PRES	present
CP	completive	PRT	particle
DAT	dative	PST	past
DECL	declarative	Q	question marker
DEF	definite	R	<i>rannig</i> (Breton preverbal particle)
DEP	“dependent” form	REFL	reflexive
DET	determiner	REL	relative operator
DITR	ditransitive	RL	realis mood
DO	direct object	SG	singular
DUB	dubitative	SP	subject prefix
EMP	emphatic marker	SUB	subjunctive
ERG	ergative	T	tense
F	feminine	TOP	topic marker
FIN	finite	TR	transitive
FOC	focus marker	UNM	unmarked (case)
FUT	future		
GEN	genitive		
IMP	imperative		
IPRS	impersonal		
IO	indirect object		
IRR	irrealis mood		
ITR	intransitive		
LINK	noun linker		
LOC	locative		
M	masculine		
MD	mood (abbreviation in trees)		
N	neuter		
N	number (abbreviation in trees)		
NEG	negation		
NDEP	“independent” form		
NMLZ	nominalisation		
NOM	nominative		

### Abbreviations for Constraints and Grammatical Phenomena:

ECOM	Economy Constraint on Merge
ELO	Extremely local optimisation
IC	Inclusiveness Condition
LDA	Long-distance agreement
MLC	Minimal Link Condition
PB	Phase Balance, Phrase Balance
PIC	Phase Impenetrability Condition
PL	Pair-list answer
SA	Single answer
SCC	Strict Cycle Condition
SMT	Strong Minimalist Thesis

Feature notation:

[●F●]	Structure-building feature (triggers Merge)
[●F●]	Satisfied, deleted structure-building feature
[*F*]	Probe feature (triggers Agree/ Value)
[F:□]	Unvalued feature
[F:⌊x⌋]	Valued feature

## Glossing

Examples are mostly glossed according to the Leipzig Glossing Rules. The rules used in this work are given below.

### Rule 2: Morpheme-by-morpheme correspondence

Segmentable morphemes are separated by hyphens, and clitic boundaries are marked by an equals sign, both in the example and in the gloss.

- (i) a. Keq kt-itom-ups tayuwe apc k-tol-i malsanikuwam-ok?  
 what 2-say-DUB when again 2-there-go store-LOC  
 When did you say you're going to go to the store? (Passamaquoddy)
- b. Was glab-s=de ... ?  
 what believe-2SG=you  
 'What do you think ...?' (German/ Ilmenau)

### Rule 3: Grammatical category labels

c. Either a category label (if acceptable) or a word from the metalanguage is used.

- (ii) Où crois=tu qu'=est all-é Jean?  
 where believe=2SG COMP=COP.3SG go-PTCP Jean  
 where believe=you that=is go-PTCP Jean  
 'Where do you believe that Jean went?' (French)

### Rule 4: One-to-many correspondences

a. When a single object-language element is rendered by several metalanguage elements, these are separated by periods.

- (iii) Ba [i nDoire ]<sub>i</sub> a<sup>L</sup> dúradh [a<sup>L</sup> fuarthas é t<sub>i</sub> ]  
 COP.PST [in Derry ] say.PST.IPRS [ find.PST.IPRS it ]  
 'It was in Derry that it was said it was found' (Irish)

c. If an element is segmentable, but the subanalysis is irrelevant, the colon is used.  
 Note: In some cases I depart from this rule in that I do not subanalyse.

- (iv) Mirenek [Parisera joango zela ] esan zidan  
 Mary:ERG [Paris:to go AUX-C ] say AUX  
 'Mary told me that she was going to Paris' (Basque)





# Chapter 1

## Introduction

The goal of this work is twofold: The first aim is to diagnose for phase heads on the basis of semantic, morphological and syntactic reflexes of movement, and to propose a phase model resting upon these empirical observations. The second aim is to propose a uniform analysis for morphological and syntactic reflexes of successive-cyclic movement.

Chapter 2 examines the “why” (section 2.1), “how” (2.2) and “where” (2.3) of successive cyclic movement.

Chapters 3, 4 and 5 are then dedicated to the data and analyses. Chapter 3 examines three types of semantic reflexes in the light of evidence for phase edges: Reconstruction effects (3.1), elliptic repair (3.2), and pair-list readings with sluiced island (3.3).

Chapter 4 deals with morphological path effects, which receive an entirely new analysis. The chapter starts out with a presentation of data from Chamorro, where the verbal morphology alters in the context of extraction (4.1). The analysis is then developed by means of these data in section (4.2). The crucial background sections are (4.2.2), which lays out the new way of approaching the data, and (4.2.3), where the theoretical background for the new analysis is presented. The central generalisation is that whenever a language shows different exponents in movement and non-movement contexts, then the marker appearing in movement contexts is less specific than the marker in non-movement contexts. This is accounted for by assuming that the mechanism that drives movement to the phase edge leads to impoverishment of the feature set of the probing head (*=probe impoverishment*). Impoverishment thus happens in the syntax. Section (4.3) applies the new analysis to several other morphological reflexes of successive-cyclic movement: complementiser selection in Irish (4.3.1), and tonal downstep deletion in Kikuyu (4.3.2). The data presented and analysed here are of course only a fraction of the relevant data that are out there.

Chapter 5 examines syntactic reflexes of successive-cyclic movement. These fall in two types, copying and partial movement, and (head and XP) movement triggered by a passing element. The first type, copying and partial movement, is solely

examined with regard to what it tells us about locations of phase edges (section 5.1). Only the reflexes of the latter type, that is, verb inversion (section 5.2) and CP extraposition (section 5.3), come out as real probe impoverishment reflexes. The verb movement to C itself, however, is not analysed as a result of probe impoverishment, but of the early timing of Phase Balance in the languages in question: The reason why I-to-C movement happens is that wh-movement to the edge of I happens before I can deal with its own EPP and  $\phi$ -features. The wh-element then blocks Agree between I and elements at the edge of v. As a result, I must move to C by a last-resort operation in order to satisfy these features. This, in turn, happens via edge property insertion, which impoverishes C in such a way that the insertion of the complementiser is blocked. CP extraposition is a more direct reflex of movement to the edge: The feature set of C is impoverished in such a way that a semantic feature, [foc] is deleted if present, and a linearisation rule enforces non-focused CP arguments to be extraposed.

Chapter 6 then draws all the strings together, and discusses the consequences of the new theory. Here I finally come back to the first goal of this work: There is evidence for C, I, v and V as phase heads. The main outcome is thus that each phrase is a phase.

# Chapter 2

## Modelling Successive-Cyclic Movement

### 2.1 Movement as a Successive-Cyclic Operation

Certain movement operations, like *wh*-movement, seem to be unbounded:

- (1) And what do you think he said he was pregnant of? – An elephant! And who do you think he said had produced it? – A French soldier!

(Anecdote 215, Hastings 1986:251)

Basically, long movement can be modelled in two ways. The first possible way is to assume that long-distance movement proceeds in one step. Under this view, the NP *what* in (1) is moved from its base-merge site to its “final destination” in  $C_1$  without being moved to intermediate sites, as indicated in (2a). In the second possible account the long movement proceeds successive-cyclically, i.e., in small steps in such a way that the moved item is internally merged at the edges of intervening XPs, leaving behind intermediate traces along its path.<sup>1</sup> This is shown in (2b) (under the [temporary] assumption that the edges of  $CP_4$ ,  $CP_3$  and  $CP_2$  are the only intermediate landing sites).

- (2) a. [ $CP_1$  What<sub>i</sub> do you think [ $CP_2$  he said [ $CP_3$  he was pregnant of  $t_i$  ]]] ?  
 b. [ $CP_1$  What<sub>i</sub> do you think [ $CP_2$   $t_i$  he said [ $CP_3$   $t_i$  he was pregnant of  $t_i$  ]]] ?

There is a great number of data that can be taken to be evidence for the view that long-distance movement involves intermediate copies or traces of the moved item. The data can be divided into three basic types:

- (3) a. Semantic effects: long-moved elements are interpreted in intermediate positions (reconstruction effects, elliptic repair, pair-list readings).  
 b. Morphological effects: long-distance movement affects the form of lexical items between and only between extraction site and final position (changing verbal agreement markers, changing complementisers).

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1. The idea of intermediate landing sites of movement goes back to Chomsky (1973), and ultimately to Ross (1967). Chomsky (1973): the best way to explain island effects is not to postulate a catalogue of islands, but to assume that movement is always local, and some categories have an escape hatch, which makes the continuation of movement possible.

- c. Syntactic effects: long-distance movement affects the syntactic environment between and only between extraction site and “final destination” of the movement (head and XP movement), or the moved item is multiply pronounced (copying, partial movement).

It is possible to model these effects without successive-cyclic movement if the operation MOVE is assumed to be a more complex operation consisting of the sub-mechanisms MOVE (or COPY + MERGE) + FORM CHAIN. FORM CHAIN is an operation that inserts traces in all intermediate positions after moving XP to its target position (Chomsky 1993, Takahashi 1994, Boeckx 2003). However, the Form Chain mechanism is problematic in two ways. Firstly, inserting traces into structure that is already built is a counter-cyclic operation; it violates the Strict Cycle Condition.<sup>2</sup>

- (4) *Strict Cycle Condition* (Chomsky 1973:243):

No rule can apply to a domain dominated by a cyclic node A in such a way as to affect solely a proper subdomain of A dominated by a node B which is also a cyclic node.

This can be reformulated as in (5):

- (5) *Strict Cycle Condition*:

Within the current XP  $\alpha$ , a syntactic operation may not target a position that is included within another XP  $\beta$  that is dominated by  $\alpha$ .

Secondly, if long-distance movement is assumed to proceed in one step, then such path effects as listed in (3) must be remodelled (e.g. by trace insertion); there is however no deeper reason for why path effects should exist at all – they come out as peculiarities of the system, and must even be made possible by an additional requirement in the first place, in addition to the mechanism that actually inserts the intermediate copy or trace. There are however grammar models in which successive-cyclic movement is enforced by independently motivated properties of the system. These properties follow from the widely assumed view that syntactic computation does not operate on large portions of structure, but that the operation space available is restricted to a small “window” (e.g. Chomsky 2000, 2006, Epstein and Seely 2002, Chomsky 2008, ultimately going back to Miller 1956, who, in reviewing a number of contemporary psychological experiments, observes that working memory capacity seems to be limited to around seven items (*chunks*) such as words, letters, or digits). The system thus repeatedly “forgets” information, and has no access to future stages of the derivation, which reduces the overall complexity of the syntactic computation. Within the minimalist program, the reduction of operative complexity is an indispensable property of a grammar system conforming to the Strong Minimalist Thesis, that is, an optimally designed, efficient computational system satisfying interface conditions (Kawashima and Kitahara 2004).

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2. See also Perlmutter and Soames (1979). For more recent formulations and attempts to derive the SCC, see Chomsky (1995), Collins (1997), Freidin (1999), Kitahara (1997), Bošković and Lasnik (1999), Watanabe (1995)

(6) *Strong Minimalist Thesis (SMT; Chomsky 2000:96):*

Language is an optimal solution to legibility conditions.

A possible implementation of this idea is the notion of phases as syntactic domains. In a phase-based syntax, the computational complexity is reduced by assuming that at various points of the computation, “older” parts of the current structure are Transferred (=“spelled out”) to the interfaces PF and LF, so that deeper embedded items cannot be accessed at the current stage of derivation. The size of the Transferred portion of structure is not arbitrary.<sup>3</sup> The effect of this cyclic spell-out mechanism is formalised in terms of a constraint, the *Phase Impenetrability Condition* (PIC).

(7) *Phase Impenetrability Condition (Chomsky 2000:108, Chomsky 2001:13):*

The domain of a head X of a phase XP is not accessible to operations outside XP; only X and its edge are accessible to such operations.

(8) *Edge (Chomsky 2001:13):*

The edge of a head X is the residue outside of X'; it comprises specifiers of X (and adjuncts to XP).

Derivation by phase yields an SMT-conforming system by simplifying the computation in the following ways (Richards 2004):

- **Minimized workspace.** Phases reduce the amount of syntactic objects that have to be processed at a time during the derivation (Chomsky 2000:99ff.).
- **Minimal delay.** Phases reduce the derivational memory (i.e., the amount of reconstruction of earlier stages of the derivation) by spelling out valued features with minimal delay (Chomsky 2001, Epstein and Seely 2002).<sup>4</sup>
- **Reduction of the search space.** Derivation by phase prevents from searching for goals in parts that are already spelled out (periodic “purging of derivational information”; Richards 2004:82), which further relieves active memory and derivational complexity (Chomsky 2004).
- **Single-cycle derivation.** The levels d-structure, s-structure and the internal level LF can and therefore must be eliminated in a phase-based system (Chomsky 2008).<sup>5</sup>

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3. See page 18.

4. “The operation Spell-Out removes LF-uninterpretable material from the syntactic object K and Transfers K to the phonological component. It must therefore be able to determine which syntactic features are uninterpretable, hence to be removed. Prior to application of Agree, these are distinguished from interpretable features by lack of specification of value. After application of Agree, the distinction is lost. To operate without reconstructing the derivation, Spell-Out must therefore apply shortly after the uninterpretable features have been assigned values (if they have not been assigned values, at this point, the derivation will crash, with uninterpretable features at the interfaces).” (Chomsky 2001:5)

5. “The EST/Y-model postulated three additional internal levels, each with specific properties: d-structure, s-structure, and LF. Furthermore, each of the [...] levels is generated by cyclic/compositional operations, which are highly redundant, covering much the same ground.

- **Strict cyclicity.** Phases entail strict cyclicity: No operation can apply to elements in lower phases as these elements are already spelled out (Chomsky 2006).<sup>6</sup>

Coming back to the main line of argumentation, the path effects listed in (3) are manifold and frequent in the world's languages (see chapters 3, 4 and 5 for data and discussion). From the perspective of system economy, a theory in which these path effects ultimately follow from independently motivated properties of the system is to be preferred over a theory that accounts for path effects by means of an additional requirement. This independently motivated property is derivation by phase: If the SMT is assumed to be the underlying principle of grammar design, and if syntactic derivations are thus assumed to proceed in phases, then long movement cannot proceed in one step. Rather, long-distance movement must be modelled as a successive-cyclic application of local movement steps. Any material needed at a later stage of the derivation which is not already at the edge of a phase head H has to be moved to the edge of H, as the complement of H is not accessible anymore as soon as H is complete.

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That sharp departure from SMT raised the question whether all of this technology can be reduced to a single cycle, dispensing with all internal levels. An even better result would be that the three internal levels are not only dispensable, but literally unformulable." (Chomsky 2005:4) "The cyclic/compositional mappings to the phonetic and semantic interfaces [...] are incorporated, and the final internal level LF is eliminated, if at various stages of computation there are Transfer operations: one hands the [syntactic object (SO)] already constructed to the phonological component, which maps it to the SM interface ("Spell-Out"); the other hands SO to the semantic component, which maps it to the C-I interface. Call these SOs *phases*. Thus SMT entails that computation of expressions must be restricted to a single cyclic/compositional process with phases." (Chomsky 2005:9)

6. "If the system is computationally efficient, once the interpretation of small units is determined it will not be modified by later operations (unless that requirement is imposed by interface conditions) – the general property of strict cyclicity that has repeatedly been found." (Chomsky 2006:4)

"[O]ptimal computation requires some version of strict cyclicity. That will follow if at certain stages of generation by repeated Merge, the syntactic object constructed is sent to the two interfaces by an operation Transfer, and what has been Transferred is no longer accessible to later mappings to the interfaces (the phase-impenetrability condition PIC). Call such stages *phases*." (Chomsky 2006:11)

## 2.2 Modelling Movement to the Edge

In the system developed so far, movement that crosses phase boundaries cannot proceed in “one fell swoop”; rather, elements that are needed later one must be made available at each phase edge. Including intermediate landing sites into the model, however, is only the first step. The next important step is to formally implement movement to an intermediate phase edge.

A system property that plays a crucial role in the discussion is the ban on look-ahead:

(9) *Lack of look-ahead:*

At the current stage of the derivation, subsequent operations and their effects are not accessible.

There are two more principles that constrain the way in which movement proceeds: Last Resort (=Economy Constraint on Merge), and the Inclusiveness Condition.

(10) *Economy Constraint on Merge (ECOM; Chomsky 1991, 1995, Collins 1997, Kitahara 1997):*

Movement must result in feature checking.

(11) *Inclusiveness Condition (IC; Chomsky 1995:228):*

Material that is not part of the lexical array (other LIs, additional features) is inaccessible throughout a derivation.

The ECOM has the effect that movement to the edge of a phase must be feature-driven. However, in many cases the higher probe is not yet available when the lowest phase including the goal is being built, and movement to intermediate edges does not seem to satisfy any feature of a given intermediate head; e.g.,  $C_2$ ,  $C_3$  and  $C_4$  in (2b) do not include a  $[\bullet+Q\bullet]$  or  $[\bullet+wh\bullet]$  feature that could possibly attract the wh-operator *what*. On the other hand, the IC bans the insertion of new structure-building features from outside the numeration during the derivation. This means that no new feature can be inserted in the derivation of (1) which would “rescue” *what* out of the part of structure that is to be spelled out. In sum, the task of modelling movement to the edge seems to lead to a dilemma, as there are independently well-motivated constraints that actually seem to prevent it.

### 2.2.1 Existing Analyses

There are three possible ways out of this. In the first approach, phase heads such as declarative C and v are indeed assumed to be merged with an optional pseudo- $[\bullet wh\bullet]$ -feature that attracts wh-phrases to their edge (Collins 1997, Sabel 1998, Fanselow and Mahajan 2000).

This approach, however, is problematic in two ways, as is shown in Heck and Müller (2003): Firstly, the presence of pseudo- $[\bullet wh\bullet]$ -features on phase heads in a numeration N is not correlated to the existence of the corresponding number of wh-elements in N; hence, the approach massively produces crashing derivations (i.e.,

derivations that contain wh-phrases, but no pseudo-[•wh•]-features on all intermediate phase heads; or pseudo-[•wh•]-features where there is no corresponding wh-phrase). Secondly, the approach makes a wrong empirical prediction. If a declarative C can include a wh-feature, then partial movement of an embedded wh-phrase to the edge of embedded C in multiple wh-questions is predicted to be acceptable, even more so in a language like German, which allows for partial wh-movement when there is a wh-scope marker (=underspecified “what”) at the edge of matrix C (see Bošković 2002). This prediction is however not borne out, as the minimal pairs in (12) show.

- (12) a. Wen<sub>1</sub> hat [vP t<sub>1</sub> sie gedacht [CP t<sub>1</sub> dass [vP t<sub>1</sub> Maria liebt ]]] ?  
 whom.ACC has she thought that Maria loves  
 ‘Who did she think that Maria loves?’
- b. Was<sub>1</sub> hat sie gedacht [CP wen<sub>2</sub> Maria t<sub>1</sub> liebt ] ?  
 what.ACC has she thought whom.ACC Maria loves  
 ‘What did she think who Maria loves?’
- c. Wer<sub>1</sub> hat t<sub>1</sub> gedacht [CP dass Maria wen<sub>2</sub> liebt ] ?  
 who.NOM hat thought that Maria whom.ACC loves  
 ‘Who thought that Maria loves whom?’
- d. \*Wer<sub>1</sub> hat t<sub>1</sub> gedacht [CP wen<sub>2</sub> Maria t<sub>2</sub> liebt ] ?  
 who.NOM hat thought whom.ACC Maria loves  
 ‘\*Who thought whom Maria loves?’

(12a) and (12b) illustrate the option of partial wh-movement in the presence of a scope marker: In (12a), the direct object of the embedded clause is moved to the edge of the matrix clause; in (12b); the embedded object is only partially moved to the edge of embedded C, while its scope is marked by the wh-element *was* at the edge of matrix C. (12c) and (12d) are multiple wh-questions: In (12c), the embedded wh-phrase stays in situ, while in the strikingly unacceptable (12d), the embedded wh-phrase is partially moved to the edge of embedded C. This behaviour is unaccounted for in the pseudo-[•wh•]-approach, as the derivation for (12d) is identical to that of the other examples discussed here at the stage when ‘whom.ACC’ is extracted to the edge of embedded C.

In addition, assuming a pseudo-[•wh•] feature on v, too, leads to wrong empirical predictions. This can be shown e.g. for multiple wh-questions in English. The approach predicts that an embedded v can have a pseudo-[•wh•] feature. Consequently, v attracts an internal argument NP<sub>[wh]</sub>. The resulting structure, however, is ill-formed in English:

- (13) \*Who<sub>1</sub> t<sub>1</sub> thinks [CP that Mary [vP what<sub>2</sub> likes t<sub>2</sub> ] ] ?

These data strongly suggest that successive-cyclic movement is not triggered by features that are optionally present on phase heads.

The second approach minimally weakens the Inclusiveness Condition in favour of the PIC by assuming that edge features can be inserted from outside the numer-



ation on a phase head in order to internally merge material which will be needed later. This solution is known as Optional EPP Feature Insertion.

- (14) *Optional EPP Feature Insertion (Chomsky 2000:109, Chomsky 2001:34):*  
The head X of phase XP may be assigned an EPP feature after the phase XP is otherwise completed, but only if that has an effect on the outcome.

In this approach, phase heads do not enter the derivation with optional edge features; rather, edge features are inserted on phase heads during the derivation under the condition that they have “an effect on outcome”. This particular implementation, however is problematic as it crucially involves look-ahead: At the stage(s) of the derivation when an edge feature can be inserted, the condition for insertion – the effect on the outcome – cannot be verified.

A third possible solution is to assume that movement to the edge is a non-feature-driven operation (i.e., repair-driven movement). Thus, Last Resort (=Economy Constraint on Merge) is assumed to be minimally violable in favour of other constraints that force movement to proceed successive-cyclically.<sup>7</sup> However, this solution by itself leads to the same look-ahead problem as Optional EPP Feature Insertion, as it is unclear what conditions repair-driven movement applies, if not massive look-ahead.

EPP Feature Insertion and Repair-Driven Movement can however be modelled in such a way that they do not involve look-ahead (Heck and Müller 2000, 2003): The starting point is the observation that the crucial piece of information that determines if EPP Feature Insertion / Repair-Driven Movement takes place is indeed available throughout a derivation, as the higher probe is present in the workspace. The workspace is defined as comprising the numeration N and any subtrees that have been created earlier by using elements from N, and that have not been used in the derivation yet; elements in the workspace are thus elements outside the present tree (Chomsky 1995, 2000, 2001). Heck and Müller propose a constraint that synchronises the current make-up of the workspace with the shape of the current phase:

- (15) *Phase Balance (PB; Heck and Müller 2000, 2003):*  
Every phase has to be balanced: For every feature  $[\bullet F \bullet]$  /  $[*F*]$  in the numeration there must be a distinct potentially available feature  $[F]$  at the phase level.
- (16) *Potential Availability:*  
A feature  $[F]$  is potentially available at the phase level if (i) or (ii) holds:
- (a)  $[F]$  is on X or on an edge element of X.

---

7. See Takahashi (1994), where the Economy Principle of Merge is violated in favour of the more important Minimize Chain Links Principle (an element that undergoes movement of type X must stop at each intermediate position of type X between base merge site and final merge site; Chomsky and Lasnik 1993).

- (b) [F] is part of the workspace of the derivation.  
 (The workspace of a derivation D comprises the numeration and material in trees that have been created earlier and have not been used yet in D.)

PB has the effect that an element of the current derivation containing a feature [F] is moved to the edge of the current phase if there is a probe P bearing  $[\bullet F \bullet]/[*F*]$  in the workspace. P is not present yet in the current tree, but the information that  $[\bullet F \bullet]/[*F*]$  exists is indeed locally available at all stages of the derivation. Elements bearing [F] that are already at the edge of the current phase  $\pi$  count as potentially available; they are thus not moved within  $\pi$ .

Phase Balance can be implemented with both feature insertion and repair-driven movement. The analysis is presented in section 2.2.3.

### 2.2.2 On the Status of Constraint Conflicts

This is a good point to reconsider the line of argumentation so far, and view the situation from a new perspective. What I have described so far is in fact a classical dilemma: SMT-conformity means to facilitate and optimise the mapping to the interfaces. This firstly means that the operative complexity is reduced (by maximally restricting the operation space), and secondly, that syntactic constraints like Inclusiveness and Last Resort are obeyed. These two requisites are formulated as meta-constraints in (17).

- (17) a. *Complexity Reduction Requirement:*  
 The operation space of syntactic computations is as small as possible, and as big as necessary.
- b. *Congruity Requirement:*  
 Syntactic constraints must be obeyed.

How big is “as big as necessary”? The operation space cannot be maximally restricted; it must be big enough to yield a successful derivation. That means, the currently active head must have access to the next-lower head for selection and head movement (Chomsky 2000). If, however, a head is accessible, then its edge is accessible, too. In addition, if the entire phase is spelled out as soon as it is completed, then movement out of a phase would not be possible, as there would be no “escape hatch” (Richards 2006). Hence, the necessary size of the operation space comprises the space between the currently created node of the category X and the next lower phase head Y (including Y). How small is “as small as possible”? The smallest possible operation space big enough to yield a successful derivation comprises the current head X, the next lower head Y, and the edges of X and Y.

If long movement is modelled successive-cyclically, then (17a) is met, but (17b) is violated (as either the Inclusiveness Condition or the Economy Condition on Merge is violated; see section 2.2 for discussion).

The only possible alternative is to extend the operation space by defining larger or dynamic phases in such a way that for any dependency, there is no phase boundary between extraction site and destination site. In other words, there would no

successive-cyclic movement after all in this alternative: in a structure that contains an item with an unhandled feature (e.g.,  $NP_{[wh]}$ ), spellout is delayed until a matching probe  $P_{[\bullet_{wh}\bullet]}$  is in the structure and has extracted  $NP_{[wh]}$  to its edge (cf. the dynamic phase model in Svenonius 2001*b*). This approach gets by without violating the Congruity Requirement, but it violates (17a), as the operation space of a derivation could then span over a potentially endless number of clauses (e.g., in (2b), the operation space spans  $C_1$ ,  $C_2$ ,  $C_3$  and  $C_4$ ). Thus, at any rate, modelling long movement involves operations that are not strictly conforming to the SMT by themselves. However, whatever operation is utilised can and even must be integrated into the system if it helps to optimise the mapping to the interfaces. The question is now, what is the less bitter pill – violating syntactic constraints on structure building, or raising the complexity of the derivation by delaying spellout (in some cases extremely)? In what follows, I am arguing in favour of the view that violations of (17a) are not part of an efficient computational system, whereas resolution of constraint conflicts by ignoring one syntactic principle in favour of a more important principle to rescue the derivation is indeed a property of an efficient system.

The argument I am putting forth is that a grammar that does not involve constraint conflicts is at the most hard to construct; in the most extreme view, it does not exist. If that is so, then a grammar must deal with constraint conflicts at any rate – an optimally designed system does not break down at the first sight of a problem; rather, it tries to rescue the derivation in some way. The only way of dealing with constraint conflicts, however, is to prioritise one of the principles over the other.<sup>8</sup> In the following, I am discussing three examples of conflicts in rule application.

### 2.2.2.1 Example 1: Conflicts in the *v* Domain

The starting point for the argumentation is the observation that there are independently well-motivated principles that indeed produce constraint conflicts. For example, conflicts emerge due to the Earliness Principle as soon as a head bears more than one active feature.

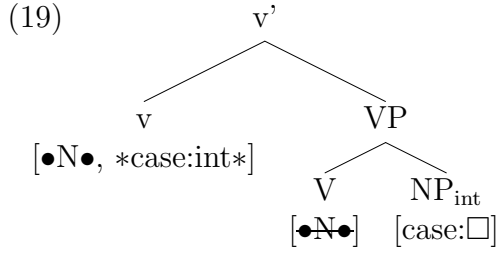
#### (18) *Earliness Principle/ Cyclicity:*

An uninterpretable feature must be marked for deletion as early in the derivation as possible (Pesetsky 1989, Pesetsky and Torrego 2001).

Take a standard transitive derivation in which *v* assigns internal case (=accusative or ergative), and in which the internal argument is merged as the sister of *V*, and the external argument as *Spec,v* (e.g. Murasugi 1992). The relevant point of the derivation is shown in (19): *V* satisfies its  $[\bullet N \bullet]$  by merging with the internal argument, and subsequently *v* is merged, bearing two active features: a structure-building feature (which serves to introduce the external argument), and a case feature.

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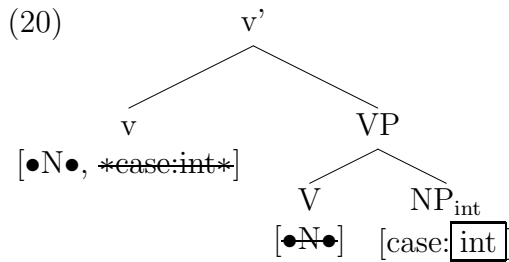
8. This argument is developed in a very similar way in Heck and Müller (2006) by means of the argument encoding example plus two other data sets (prenominal dative possessors in German, *SpecC* expletives in German).

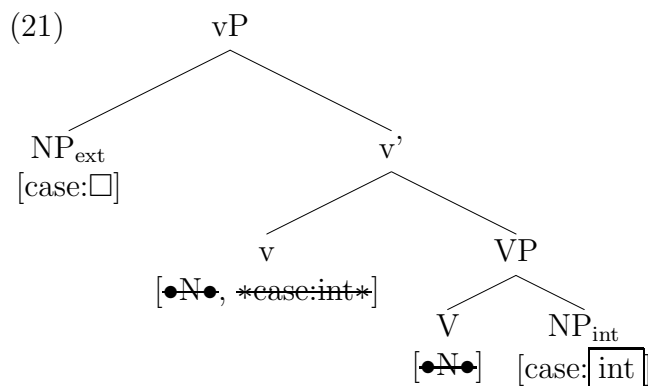


At this point, an indeterminacy in rule application arises: The next operation could either be Value( $v$ ,  $NP_{int}$ ), or Merge ( $v$ ,  $NP_{ext}$ ). The Earliness Principle has the effect that if an operation like Merge or Value is possible at a stage of the derivation, then it must apply at once. This leads to a dilemma:

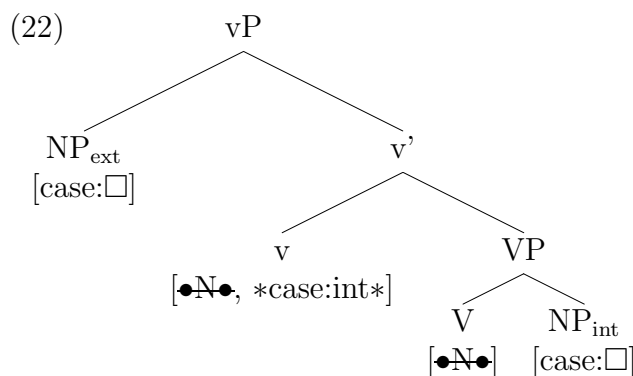
Only one operation can apply first, as required by Earliness. In view of this, one might conclude that an Earliness requirement should be abandoned for either Merge or Agree, so as to resolve the indeterminacy. However, such a step would make it necessary to deny all empirical relevance of Earliness for one of the two operations, and it would also be at variance with the complexity-based motivation. In contrast, I would like to contend that conflicts of this type are real, and must be resolved in a language by giving one Earliness requirement priority over the other in the case of conflict – in other words, in ranking the two requirements. (Müller 2008a:6)

Conflicts of this sort can be resolved in different ways, and cross-linguistic variation follows directly from how different languages “decide” to continue when such a conflict emerges (Samek-Lodovici 2006:78). The two possible resolutions of the Merge/Value conflict presented here directly correspond to the basic accusative and ergative encoding patterns (Müller 2008a): Some languages resolve the indeterminacy in rule application by giving Value priority over Merge. The order of feature handling is thus  $[*case:int*] \gg [\bullet N \bullet]$ . This yields an accusative pattern: At first,  $NP_{int}$  is assigned internal case, then  $NP_{ext}$  is merged;  $NP_{ext}$  later receives external case (=nominative/ absolutive) from I. This is shown in (20) and (21).





Some languages, on the other hand, resolve the indeterminacy in rule application by giving Merge priority over Value. The order of feature handling is thus  $[\bullet N \bullet] \gg [*case:int*]$ . This gives rise to an ergative pattern: At first,  $NP_{ext}$  is merged, as shown in (22).



Now  $[*case:int*]$  must be assigned. However, it cannot be assigned to  $NP_{int}$ , as  $NP_{ext}$  is closer to  $v$ . This results from the definitions of Agree and Path:

(23) *Agree*:

$\alpha$  agrees with  $\beta$  with respect to a feature bundle  $\Gamma$  iff (a), (b) and (c) hold:

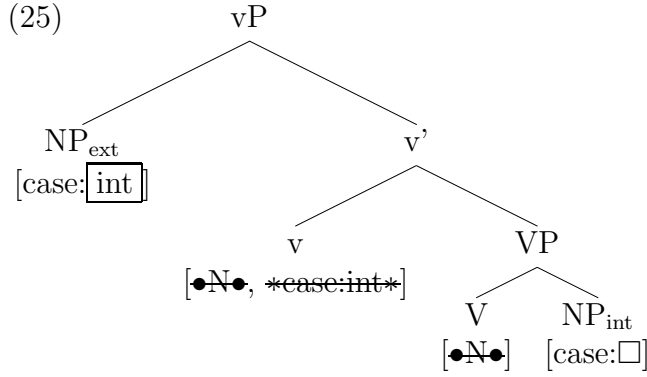
- (a)  $\alpha$  bears a probe feature  $[*F*]$  in  $\Gamma$ ,  $\beta$  bears a matching goal feature  $[F]$  in  $\Gamma$ .
- (b)  $\alpha$  m-commands  $\beta$ .
- (c) There is no  $\delta$  such that (i) and (ii) hold:
  - (i)  $\delta$  is closer to  $\alpha$  than  $\beta$  (= the path from  $\delta$  to  $\alpha$  is shorter than the path from  $\beta$  to  $\alpha$ ).
  - (ii)  $\delta$  has a feature  $[F]$ .

(24) *Path*:

The path from A to B is the set of categories C such that (a) and (b) hold:

- (a) C dominates A or B.
- (b) The minimal XP that dominates C is the minimal XP that dominates both A and B.

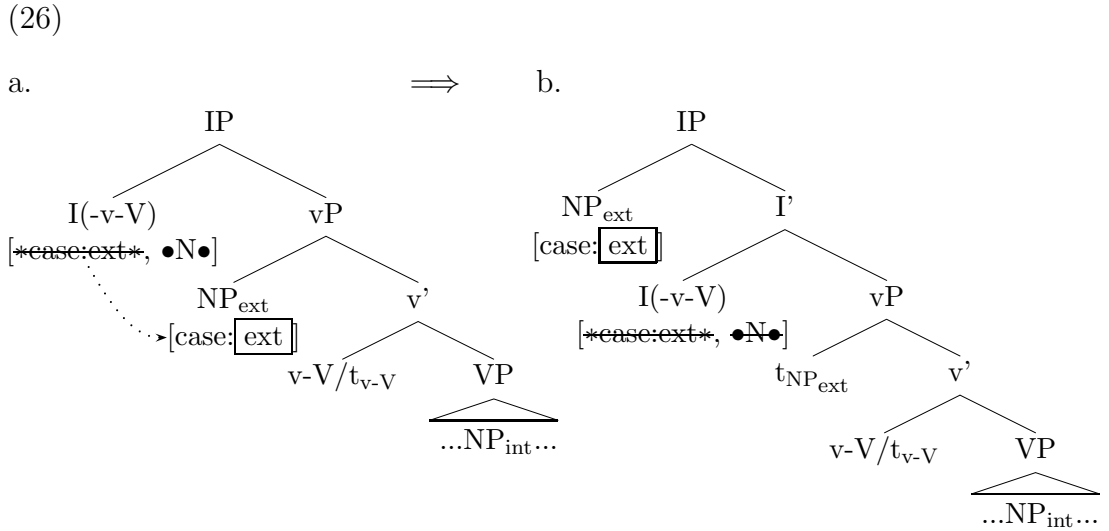
The length of a path is thus determined by its cardinality. Specifier and complement of a head  $\alpha$  are equally close to  $\alpha$ ; the specifier of  $\alpha$  is closer to  $\alpha$  than any category that is further embedded in the complement of  $\alpha$  (Pesetsky 1982, Collins 1994). As a result,  $NP_{ext}$  is assigned ergative, as shown in (25).



### 2.2.2.2 Example 2: Conflicts in the I Domain

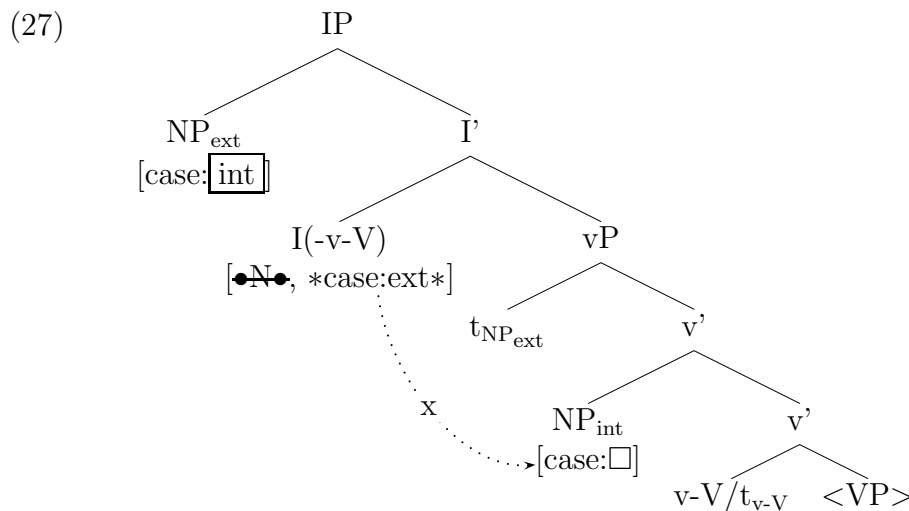
A very similar conflict occurs in the I domain, and the possibility of resolving it in two ways derives the strong empirical generalisation that SVO order is banned in ergative languages (“Mahajan’s Generalisation”; Lahne 2008a). The analysis works along the same line of argumentation as Müller (2008a): The feature set of I contains a case feature  $[*case:ext*]$ , and can contain an EPP feature  $[•N•]$ . Thus, when I is merged, then an indeterminacy in rule application arises, as the next operation could either be  $Value(I, NP_{int})$ , or  $Merge(I, NP_{ext})$ .

It was said above that in languages finally showing an accusative pattern, the order of operation application is  $Value \gg Merge$ . Thus, the order of feature handling of I is  $[*case:ext*] \gg [•N•]$ : I first values the case feature of  $NP_{ext}$ , and subsequently  $NP_{ext}$  is internally merged as SpecI. This is shown in (26).



In languages that finally show an ergative pattern, the order of operation application is  $Merge \gg Value$ . Thus, if I has an EPP feature ( $= [•N•]$ ), the order of feature handling is  $[•N•] \gg [*case:ext*]$ . Consequently, I first internally merges  $NP_{ext}$  as its specifier. This would yield SVO, but the derivation crashes in the next step: I cannot value the case feature of  $NP_{int}$  as  $NP_{ext}$  intervenes. This again

follows from the definitions of Agree and Path:  $\text{NP}_{\text{ext}}$  bears a case feature, and is closer to I than  $\text{NP}_{\text{int}}$  is; it is thus a defective intervener for Agree:



Consequently, in those languages where Merge precedes Value (which finally yields an ergative case pattern according to the analysis), all derivations crash in which I has an EPP feature. With only EPP-less derivations converging in ergative languages, both external and internal argument always end up as specifiers of v in this class of languages; consequently, there is no position between them that the verb could possibly fill.

### 2.2.2.3 Example 3: A Definition of Agree

Haegeman and Lohndal (2008) argue in favour of the view that the simplest possible definition of Agree should be assumed. They propose a definition as follows:

- (28) *Agree*  
 $\alpha$  agrees with  $\beta$  iff  $\alpha$  c-commands  $\beta$ .

Haegeman and Lohndal (2008) further propose that there are additional requirements which must be met, e.g. an identity requirement ( $\alpha$  and  $\beta$  must share a common feature), a maximisation requirement ( $\alpha$  and  $\beta$  agree in the maximally possible number of features), and a minimality condition. The system works in such a way that Agree only takes place if the matching, maximisation and/or minimality requirements are met.

This interaction of requirements is in fact a system with violable constraints and constraint prioritisation: In a constellation where  $\alpha$  c-commands  $\beta$ , but  $\alpha$  and  $\beta$  do not have a common feature, or an element  $\gamma$  intervenes, the Agree condition in (28) is blocked (or *violated*) in favour of a more important (or *higher-ranked*) matching, maximisation and/or minimality requirement. The constraints are thus ranked as shown in (29):

- (29) *Ranking of Agree and conditions on Agree:*  
 $\{\text{INTERVENTION/MINIMALITY, FEATURE MATCHING}\} \gg \text{AGREE}$

## 2.2.2.4 Example 4: Conflicts in Vocabulary Insertion

Conflict in rule application also arises in other parts of the grammar, for example in the morphology, where underspecification of inflectional markers leads to competition between markers. This can be seen e.g. in the inflection of pronominals in German (Bierwisch 1967, Blevins 1995, Wunderlich 1997, Wiese 1999, Müller 2002a,b).<sup>9</sup>

Table 1

*German**Determiner inflection*

<i>dies</i>	SG			PL		
	M	N	F	M	N	F
NOM	-r	-s	-e	-e	-e	-e
ACC	-n	-s	-e	-e	-e	-e
DAT	-m	-m	-r	-n	-n	-n
GEN	-s	-s	-r	-r	-r	-r

Table 1 shows that the paradigm contains massive syncretism; only 5 markers are distributed over 24 different syntactic contexts (for example, [acc sg m] shares the marker /-n/ with [dat pl], and /-e/ appears in the non-oblique cases (nominative, accusative) in all contexts except for masculine and neuter singular). However, assuming 24 rules of vocabulary insertion is clearly not an optimal solution. A strategy of deriving the marker syncretisms in an efficient way is to assume that markers are specified for natural classes of contexts, which are yielded by decomposing morpho-syntactic features like case or gender, and that markers need not be fully specified for all categories of morpho-syntactic features. This is the strategy underlying the specifications for pronominal inflection markers proposed by Wunderlich (1997), which are given in (30). The marker /m/, for example, is specified for case (dative), but not for gender and number.

(30) Vocabulary insertion rules (Wunderlich 1997):<sup>10</sup>

R <sub>1</sub>	[+pl,+lr,+hr,[+plV+f]]	→ /n/	(Dat.Pl.)
R <sub>2</sub>	[+hr,[+lrV+n],[+plV+f]]	→ /r/	(Dat./Gen.F.Sg., Gen.Pl.)
R <sub>3</sub>	[+plV+f]	→ /e/	(Nom./Acc.F.Sg./Pl.)
R <sub>4</sub>	[+lr,+hr]	→ /m/	(Dat.M.Sg./Neut.Sg.)
R <sub>5</sub>	[+n,+hr]	→ /s/	(Gen.M.Sg./N.Sg.)
R <sub>6</sub>	[+hr,+m]	→ /n/	(Acc.M.Sg.)
R <sub>7</sub>	[+m]	→ /r/	(Nom.M.Sg.)
R <sub>8</sub>	[ ]	→ /s/	Nom./Acc.N.Sg.)

9. The paradigm is simplified in that schwa before /s/,/n/ and /m/ is assumed to be a phonological phenomenon.

10. Disjunction of features is allowed in this system, and reference to negative features is impossible. Underlying feature decomposition (Wunderlich 1997):

- (i) Nominative: [ ] (featureless case)
- Accusative: [+hr] (there is a higher  $\Theta$ -role)
- Dative: [+hr +lr] (there is a higher  $\Theta$ -role, there is a lower  $\Theta$ -role)
- Genitive: [+hr +n] (there is a higher  $\Theta$ -role, inherent nominal case)
- Masculine: [+m]
- Feminine: [+f]

The winning contexts are given to the right of each rule.



The crucial observation is that underspecification typically leads to a competition for vocabulary insertion between the markers of a language; in other words, a conflict in rule application. The competition for the German pronominal inflection is shown in table 2.

Table 2

	<i>dies</i>	SG			PL	
		M	N	F	M	N F
<i>German</i> <i>Marker</i> <i>conflicts</i>	NOM	<span>r<sub>7</sub></span> s <sub>8</sub>	<span>s<sub>8</sub></span>	<span>e<sub>3</sub></span> s <sub>8</sub>	<span>e<sub>3</sub></span> s <sub>8</sub>	
	ACC	<span>n<sub>6</sub></span> r <sub>7</sub> s <sub>8</sub>	<span>s<sub>8</sub></span>	<span>e<sub>3</sub></span> s <sub>8</sub>	<span>e<sub>3</sub></span> s <sub>8</sub>	
	DAT	<span>m<sub>4</sub></span> n <sub>6</sub> r <sub>7</sub> s <sub>8</sub>	<span>m<sub>4</sub></span> s <sub>8</sub>	<span>r<sub>2</sub></span> e <sub>3</sub> m <sub>4</sub> s <sub>8</sub>	<span>n<sub>1</sub></span> r <sub>2</sub> e <sub>3</sub> m <sub>4</sub> s <sub>8</sub>	
	GEN	<span>s<sub>5</sub></span> n <sub>6</sub> r <sub>7</sub> s <sub>8</sub>	<span>s<sub>5</sub></span>	<span>r<sub>2</sub></span> e <sub>3</sub> s <sub>5</sub> s <sub>8</sub>	<span>r<sub>2</sub></span> e <sub>3</sub> s <sub>5</sub> s <sub>8</sub>	

The conflict can be resolved either by an extrinsic rule ordering (as in Bierwisch 1967), or by having recourse to the concept of specificity (as e.g. in Blevins 1995, Wunderlich 1997, Wiese 1999). In the latter approach, the principle resolving the rule conflict is the Subset Principle.<sup>11</sup>

(31) *Subset Principle* (see Halle 1997):

A vocabulary item V is inserted into a functional morpheme M iff. (i) and (ii) hold:

- (i) The morpho-syntactic features of V are a subset of the morpho-syntactic features of M.
- (ii) V is the most specific vocabulary item that satisfies (i).

The Subset Principle has the effect that whenever a higher specified marker competes for a syntactic context with a less specified marker, then the higher specified marker is inserted. Ideally, specificity is purely determined by cardinality (Halle 1997), i.e., a matching marker  $\alpha$  with a feature set A is more specific than a second matching marker  $\beta$  with a feature set B iff.  $|A| > |B|$ . There are, however, analyses in which the nature of the features plays a role in determining the specificity of a rule (e.g. in Wunderlich 1997, Wiese 1999).

In Wunderlich (1997), the vocabulary insertion rules apply in the order  $R_1 \dots R_8$  as shown in (30). This order is determined by specificity; however,  $R_4$ ,  $R_5$ ,  $R_6$ , and maybe  $R_3$ , which must apply in this order, have the same degree of specificity (if cardinality is the defining property). The analysis must thus make use of the assumption that a case feature is more specific than a gender feature. Consequently, the marker competition in table 2 is resolved as indicated (the winning markers are boxed).

### 2.2.2.5 Conclusion

The examples suggest that a grammar without constraint conflicts is at the most hard to construct; in the most extreme view, it does not exist. A grammar must

11. Several versions of this principle are known as *Emergence of the Unmarked*, *Specificity Condition*, *Elsewhere Principle*, *Proper Inclusion Principle*, *Blocking Principle*, *Paṇinī's Principle*, or *Proper Inclusion Condition*, among others; e.g. Kiparsky (1973), Di Sciullo and Williams (1987), Halle (1997), Stump (2001).

thus deal with constraint conflicts at any rate – an optimally designed system does not collapse at the sight of a problem, but tries to rescue the derivation. The only way of dealing with constraint or rule conflicts, however, is to prioritise one of the principles or rules over the other. Consequently, although prioritising SMT-conforming syntactic constraints seems to be at odds with the SMT at first sight, it must be possible whenever needed to proceed with, and eventually rescue a derivation. Constraint prioritisation thus has the status of a necessary last resort operation (see also Collins 2001).

Coming back to the main line of argumentation: Is long movement better analysed as a series of local movement steps (where movement to the intermediate edges results in constraint violation), or as movement in one step after all (where spellout delay leads to a rise in operative complexity)? The answer is straightforward now: The “less bitter pill” is ranking and violation of conflicting rules; in fact, the ranking and violation of conflicting rules is conceptually motivated. It must be possible whenever needed to proceed with (and eventually rescue) a derivation. Prioritising one requirement in favour of another thus has the status of a necessary last resort operation. In addition, the possible alternative resolutions of constraint conflicts directly lead to an account of cross-linguistic variation.

Spellout delay, on the other hand, is not part of an optimal system: Firstly, even a spellout-delay system gives rise to constraint violations as the ones presented in the previous chapters. If long movement can be modelled by only violating desideratum (17b), then a system where both (17b) and (17a) are violated would be suboptimal. Secondly, spellout delay would only occur in the context of long extraction, and is always translatable into a system with static phases and successive-cyclic movement. Thirdly, as was already mentioned in section 2.1, movement in “one fell swoop” predicts path effects to not exist; they must be made possible by an additional principle (in addition to the mechanism that inserts the intermediate copy or trace, and the mechanism that yields the path effect). Such a system is arguably less optimal than a system where the “movee” is always made locally available and can thus trigger path effects (i.e., only the mechanism that yields the path effect is additionally needed).

To sum up, it follows from considerations of system economy that spellout delay is not part of an optimal system, whereas ranking and violation of conflicting rules is conceptually motivated: it serves to build an efficient computational system.

### 2.2.3 Derivational Optimisation of Successive-Cyclic Movement

It seems to me to be necessary to make a general remark about the status of optimisation within the minimalist program. To this end, I am starting this section with a quotation from Samek-Lodovici (2006), which brings to the point all there is to say about this topic:

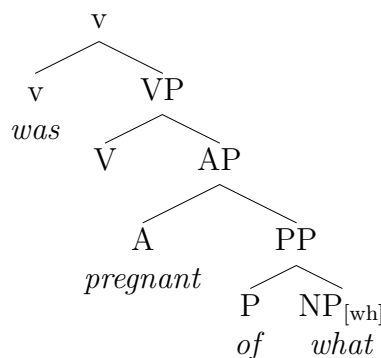
The Minimalist Program (Chomsky 1995, 2000) and Optimality Theory (Prince and Smolensky 1993, 2004) are not alternative theories logically inconsistent with each other. Optimality Theory is a theory of

how universal constraints of grammar interact (Prince and Smolensky 1993, Grimshaw 2005). Minimalism, as Chomsky notes (2000:41), is a research program – not a theory – investigating to what extent the language faculty provides an optimal design for the satisfaction of conditions at the interface with the sensory-motor system (PF) and the system of thought (LF). It is thus possible to pursue an OT-perspective of human grammar while maintaining minimalist goals. (Samek-Lodovici 2006:77)

The concept of optimisation adopted here has very little to do with earlier, representational OT implementations (Grimshaw 1997, Légendre et al. 1998, Vikner 2001, among many others). In the new approach, optimisation is not the core of the grammar, but a serial mechanism controlling extremely local operations if there is a local conflict between two constraints, or a conflict in rule application. The input is the step in the syntactic derivation as it is at the point of the derivation where the optimisation takes place (see Heck et al. 2001), and the “optimisation” is actually a **decision on what happens next**.

This section continues the discussion from section 2.2.1: Phase Balance can be implemented with both feature insertion and repair-driven movement. Consider the derivation of example (1) in (32).

(32) a. Current tree:



b. Workspace: { ...  $C_{[\bullet+wh\bullet]}$ , [NP you], [NP he], [NP he], ... }

At this point, PB is not met: there is a feature  $[\bullet+wh\bullet]$  in the numeration, but no corresponding [wh] feature potentially available. Consequently, *what* is extracted out of the complement of *v*. This can happen in two ways: In one possible scenario, the Economy Condition on Merge has priority over the Inclusiveness Condition (PB  $\gg$  ECOM  $\gg$  IC). The competition is shown in (33).

(33) *Balancing the vP phase: ECOM  $\gg$  IC*


Input: [ <sub>v</sub> [ <sub>v</sub> ...] [ <sub>VP</sub> ... NP <sub>[wh]</sub> ... ]]				
Workspace: { ... $C_{[\bullet+wh\bullet]}$ ... }		PB	ECOM	IC
☞ a.	[ <sub>vP</sub> [ <sub>NP<sub>[wh]</sub></sub> ] <sub>i</sub> [ <sub>v'</sub> [ <sub>v</sub> <del><math>\bullet X \bullet</math></del> ] [ <sub>VP</sub> ... <sub>t<sub>i</sub></sub> ... ]]]			*
b.	[ <sub>vP</sub> [ <sub>NP<sub>[wh]</sub></sub> ] <sub>i</sub> [ <sub>v'</sub> [ <sub>v</sub> ...] [ <sub>VP</sub> ... <sub>t<sub>i</sub></sub> ... ]]]		*!	
c.	[ <sub>vP</sub> [ <sub>v</sub> ...] [ <sub>VP</sub> ... NP <sub>[wh]</sub> ... ]]	*!		

The input is the derivation at the stage when *v* is merged. Leaving the *wh*-element in situ (= output (c)) is not the optimal decision, as it does not respect PB. Output

(b) respects PB, but still fatally violates ECOM. The winning output is output (a), though it violates IC. Thus, whenever the ECOM has priority over the IC, Phase Balance is satisfied by inserting an edge feature, which attracts the wh-element to the edge of v.

The alternative is that the Inclusiveness Condition has priority over the Economy Condition on Merge. The corresponding competition is shown in (34).

(34) *Balancing the vP phase: IC*  $\gg$  *ECOM*

Input: $[_v [_v \dots] [_{VP} \dots NP_{[wh]} \dots]]$ Workspace: $\{ \dots C_{[\bullet+wh\bullet]} \dots \}$		PB	IC	ECOM
a.	$[_{VP} [NP_{[wh]}]_i [_{v'} [_v \bullet X \bullet] [_{VP} \dots t_i \dots]]]$		*!	
 b.	$[_{VP} [NP_{[wh]}]_i [_{v'} [_v \dots] [_{VP} \dots t_i \dots]]]$			*
c.	$[_{VP} [_v \dots] [_{VP} \dots NP_{[wh]} \dots]]$	*!		

Here output (b) wins, though it violates the low-ranked ECOM, as the alternative making use of edge feature insertion violates the higher-ranked IC; the output in which the wh-element is not extracted to the edge is prohibited, as it violates PB. As a result, successive-cyclic movement emerges as repair-driven, i.e., non-feature-driven movement.

One might be led to think that the difference in ranking has no empirical relevance – the resulting winners (33a) and (34b) are almost identical, with the only difference that in (33a), the phase head includes a satisfied edge feature, whereas the feature set of (34b) stays unchanged. I will, however, argue that both rankings can be found in the world's languages, and that the different rankings account for cross-linguistic variation in the reflexes of successive-cyclic movement. This is yielded by a minimal change in the assumptions about the nature of the inserted feature. The analysis will be developed in detail in section 4.2 (especially in 4.2.3.4, which introduces the concept of probe impoverishment, and 4.2.3.5, which discusses cross-linguistic variation), using data from Chamorro.

## 2.3 Modelling Phases

### 2.3.1 Defining the Size of Phases: Existing Models

The discussion in the previous section leads to the next question: Which heads are phase heads? In a first type of approach, which I am referring to as ‘selective-static’, being a phase head is fixed property of certain heads, that is, C, v, and maybe D/N (Chomsky 2000, 2001, Matushansky 2003, Richards 2007, among many others). A second course of analysis treats phases as dynamic entities: the phase head property can be shifted upwards in the tree (*dynamic phase system*; Svenonius 2001*b*, den Dikken 2007, Gallego 2005, Gallego and Uriagereka 2006). In a third kind of approach, which I am calling ‘minimal-static’, each phrase head is assumed to be a phase head (Manzini 1994, Epstein and Seely 2002, Müller 2004). This section briefly reviews these three types of analysis.

#### 2.3.1.1 Phases as Propositional Entities

In what is arguably the conventional approach, only C and v are assumed to be phase heads, whereas other heads (except perhaps for D/N) are not (Chomsky 2000:106, Chomsky 2001:12, Matushansky 2003). The rationale behind this assumption is that C and v are the heads of the propositional categories CP and vP. These categories are independent at LF as a designated semantic type can be associated with them (vP, a full argument structure, is the minimal category that is assigned a truth value; CP, a full clausal entity including tense and force, is the highest type associated with a truth value). Thus, phases are semantically complete, but not necessarily internally convergent (i.e., not syntactically complete in that all features are valued).

A number of tests have been designed to demonstrate the phasehood of C and v. The basic idea behind these tests is that those objects that are Transferred to PF together are phonetically isolable; hence, they can be clefted, extraposed, right-node raised, used in *though*-constructions, or in predicate fronting (Matushansky 2003; see also Abels 2003). However, the tests and their outcome are problematic in two ways. Firstly, due to the cut-off point of spellout, the complements of the phase heads (in the conventional view: IP, VP) are the parts of structure that are Transferred to the interfaces, and that should thus, if at all, be the independent categories at the interfaces (Nissenbaum 1998, Abels 2003). Secondly, the tests are inconclusive; LF-independence does not completely overlap with PF-independence (Bošković 2002, Matushansky 2003, Boeckx and Grohmann 2006). Let me briefly show this for the clefting test. The idea is that a unit X is a phonologically (and therefore semantically) independent unit if X can be clefted. This is true for the CP-IP contrast – CPs, but not IPs, can be clefted:

- (35) It is to go home every evening that John prefers / \*seems (Rizzi 1982)

The minimal pairs in (36), however, show that clefting does not target vPs (though it can target DPs/NPs; examples from Matushansky 2003):

- (36) a. It's [<sub>CP</sub> that Desdemona was faithful] that Othello doubted  
 b. \*It's [<sub>VP</sub> doubt that Desdemona was faithful] that Othello did  
 c. It's [<sub>NP</sub> Desdemona's faithfulness] that Othello doubted

A similar point can be made with regard to right-node raising. Irrespective of the question if right-node raising involves movement or not, there must be a pause before the “raised” material, which is assumed to signal PF independence. But both CPs and IPs are isolable, as the examples in (37) show (Bošković 2002:182, Abels 2003:63; examples from Postal 1998).

- (37) a. John believes, and Peter claims – [<sub>CP</sub> that Mary will get a job]  
 b. John believes that, and Peter claims that – [<sub>IP</sub> Mary will get a job]  
 c. I know when, but I don't know where – [<sub>IP</sub> Amanda met Steve]

Furthermore, there has been some controversy over the phase head status of passive and unaccusative *v*. In Chomsky's original proposal, passive/unaccusative *v* is not a phase head – if passive/unaccusative *v* were a phase head, then agreement between *I* and the argument NP would be blocked in Expl-associate constructions like (38), as the NP is already Transferred at the point when *I* is merged (Chomsky 2000:108, Chomsky 2001:12f.). Thus, only *C* and unergative/transitive *v* are phase heads, by virtue of their bearing uninterpretable  $\phi$ -features (Chomsky 2008).

- (38) [<sub>IP</sub> There [<sub>I</sub> ] [<sub>v/VP</sub> arrived [<sub>NP</sub> a man] ]]

This view is challenged in Legate (2003) and Sauerland (2003), who provide empirical evidence that the edge of passive/unaccusative *v* is a reconstruction site just as the edge of transitive *v* (the data are presented and discussed in section 3.1). Centeno and Vicente (2008) provide additional evidence from determiner sharing in Spanish (where the position of a NP<sub>[–wh]</sub> marks an intermediate landing site, which is shown to be the edge of *v* in raising, passive and unaccusative contexts). The conclusion is thus that *v* is always a phase head. In the standard system, the “spine” of the derivation is thus a sequence of the type ‘phase head - non-phase head - phase head - non-phase head’ (*C* - *I* - *v* - *V*; Chomsky 2000, 2001, Richards 2007; see also page 137 for further discussion).

### 2.3.1.2 *Dynamic Phases*

A number of phase models share the basic assumption that phases are not fixed entities, but ‘dynamic’ in the sense that phasal domains are extendable (i.e., spell-out can be delayed) under certain conditions.

A general caveat is in order before I proceed. The original rationale behind phases – reduction of operation space – implies that phases are as small as possible. In dynamic phase models, however, phases can become very large, spanning a whole CP (as in Gallego 2005 and den Dikken 2007), or even a whole sentence (as in Svenonius 2001*b*). The system thus has to keep track of larger structures, i.e., more material has to be placed in active memory for longer. I argued in section

(2.2.2) that the delay of spellout beyond the maximally necessary size that yields a successful derivation is not part of an efficient computational system. Dynamic phase theories are therefore potentially not conforming to the SMT.

The aim of Svenonius (2001*b*) is to give a new account of Holmberg's Generalisation, a constraint on object shift and scrambling which states that these kinds of movement cannot cross an overt c-commanding head (Holmberg 1999, among others). Thus, object movement implies verb movement: Object shift is possible in OV languages, where no V head is crossed by a moving object (given that OV order is derived by V-to-I(-C) movement), and in VO languages wherever V moves upwards. In Svenonius (2001*a, b*), the defining property of a phase is internal convergence. It is defined as *completeness* as given in (39):

(39) *Completeness*:

An XP is complete if it contains no unvalued features. Unvalued features of an item X are valued only at X's final landing site.

Furthermore, a kind of Earliness condition holds: An XP must be sent to the interfaces as soon as it is complete. In languages like English, where the verb does not leave the vP, VP including the object is complete and thus sent to the interfaces when vP is finished. As a result, the object is not accessible for further movement. In OV and verb-second languages, on the other hand, the features of the verb are valued in V's final landing site C. Thus, no XP along the path of V counts as completed, so that evaluation/spell-out is delayed until the verb has reached C. As a result, CP ends up as one single phase. The object is then still accessible and can be moved anti-cyclically (i.e., violating the Strict Cycle Condition) within the CP by means of edge feature insertion if this is necessary for interpretational reason (i.e., movement is not the cause, but the effect of interpretation).

Svenonius (2001*b*) is a dynamic phase system in the sense that phases are no pre-defined entities of fixed size; rather, the system Transfers any entity as soon as it is convergent. Phase heads triggering spellout of their complements are not needed in this system. A main insight of the account is that the expansion of the phase is triggered by head movement. This idea is originally proposed in Chomsky (1986*a*), where V-to-I movement has the effect that I governs the lexical category V, which lifts the VP barrier. The most prominent formulation of the idea is however the definition of *Barrier* in Baker (1988):

(40) *Barrier*

An XP is a barrier between  $\alpha$  and  $\beta$  iff. XP excludes  $\alpha$  and includes  $\beta$  and either (a) or (b) hold:

(a) XP is not selected;<sup>12</sup>

(b)  $\beta$  is in the opaque domain<sup>13</sup> of XP, and X is distinct from Y (where Y is the next higher maximal projection that dominates  $\alpha$ ).

Let me briefly show which effect (40) has on the barrier status of VP (in the original architectural setting without vP). VP is selected by IP by definition; hence, VP

12. Definition: A selects B iff. A assigns a  $\theta$ -role to B; C selects IP; I selects VP.

13. Definition:  $\beta$  is in the opaque domain of XP iff.  $\beta$  or a ZP including  $\beta$  is selected by X.

never counts as a barrier according to condition (40a). If VP is a barrier or not is therefore depending on (40b). The first part of (40b) states that an XP can be a barrier only for elements in the opaque domain of X. This includes all arguments within the VP (both complement and specifier), as well as NP<sub>ext</sub> at the edge of I.<sup>14</sup> On the other hand, the definition excludes adjuncts, heads, and specifiers of heads other than V and I. VP thus always counts as a barrier for its arguments by this condition; the barrier status of VP therefore solely depends on the second part of (40b), the distinctness condition. Distinctness is defined as follows:

(41) *Distinctness*

Y is distinct from Y iff. no part of Y contains the index of X.

If V-to-I movement takes place, then V is no longer distinct from I, as I now wholly contains V, including V's index. This is the crucial part of the definition: if V-to-I movement does not take place, then (40b) is fulfilled, so that VP is a barrier. On the other hand, if verb movement takes place, then (40b) is not met, and VP is not a barrier. In this sense, head movement opens barriers.

There are two further phase-based implementations of Baker's (1988) insight, which are chronologically parallel developments. In den Dikken (2007), the original phase-defining property is semantic completeness as in the "standard" model, with the difference that only simple predications (vPs), but not CPs, are inherent phases.

(42) *Inherent Phase:*

An inherent phase is a predication (subject-predicate structure), i.e., entities of the type  $\langle e, t \rangle$ .

The main premise of this approach is that an XP which is not an inherent phase acquires phase status when the head of an inherent phase moves to X. This is *Phase Extension*.

(43) *Phase Extension:*

Syntactic movement of the head H of a phase  $\alpha$  up to the head X of the node  $\beta$  dominating  $\alpha$  extends the phase up from  $\alpha$  to  $\beta$ ;  $\alpha$  loses its phasehood in the process, and a constituent on the edge of  $\alpha$  ends up in the domain of the derived phase  $\beta$  as a result of phase extension.

In den Dikken (2007), this system is used to derive predicate inversion, dative shift, parts of Holmberg's Generalisation, quantifier scope freezing, and the island status of subject-wh-questions.

Gallego (2005) and Gallego and Uriagereka (2006) propose a similar mechanism to account for CED effects. The central mechanism is Phase Sliding:

(44) *Phase Sliding:*

Movement of a phase head leads to an "upwards percolation" of phase prop-

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14. Reason: NP<sub>ext</sub> is originally selected by V, and VP is selected by I. NP<sub>ext</sub> binds its VP-internal trace is thus perceived by I as an element from within the selected category.



erties to the category to which it moves. Thus, in languages with v-to-I movement the phase is I, not v.

The differences between Phase Extension and Phase Sliding are minimal: Firstly, in Phase Extension, v loses its (inherent) phase head status, and I becomes a (derived) phase head. In Phase Sliding, on the other hand, v stays a phase head and contributes this property to the new level, so that IP becomes a phase although I does not become a phase head. Secondly, CP is not an inherent phase in the Phase Extension model (though it can become a derived phase by v-I-C movement), whereas it is in the Phase Sliding model.

### 2.3.1.3 *Each Phrase is a Phase*

In section 2.2.2, I discussed the system requirements that the operation space of syntactic computations be as small as possible, and as big as necessary ('Complexity Reduction Requirement'). The conclusion was that the largest necessary portion of operation space comprises the current head X, the **next lower phase head** Y, and the edges of X and Y; the smallest possible operation space, on the other hand, stretches from the currently created node of the category X to the **next lower head** Y (see page 2.2.2). An optimal system is built in such a way that it fulfills both requirements: the largest necessary phase size is at the same time the smallest possible operation space yielding a successful computation. In other words, the next lower head is always the next lower phase head. The null hypothesis for phase size is thus that each phrase is a phase.

#### (45) *Null Hypothesis on Phase Size*

Each phrase is a phase.

There are a number of analyses that go along these lines; I will refer to them as 'minimal-static phase systems'. The idea that XP movement has to proceed through each XP on the path goes back to Manzini (1994), who unifies the conditions on head movement and XP movement under one locality condition. Manzini's analysis is based on the notion of 'minimal domain':

#### (46) *Minimal Domain*

The minimal domain (X) of a head X consists of all and only the elements that are immediately contained by, and do not immediately contain, a projection of X.

The minimal domain (X) of a head X thus contains X itself, X's specifier, X's complement, and all adjuncts to X<sup>n</sup>. Movement is constrained by a locality condition according to which movement from a minimal domain (X) to a minimal domain (Y) is possible iff. (X) and (Y) are adjacent:

#### (47) *Locality*

For all  $i$  (where  $i=1-n$ ), let an item  $A_i$  be in  $(X_i)$ . Given a dependency  $(A_{i=1}, \dots, A_{i=n})$ , for all  $i$ ,  $(X_i)$  and  $(X_{i+1})$  are adjacent.

(47) has the effect that movement must proceed through every phrase along the path to its final landing site. Other systems working along the same lines are Takahashi (1994), Agbayani (1998) and Sportiche (1998). I am aware of two implementations of this idea in phase-based systems: Müller (2004) and Epstein and Seely (2002). In Müller (2004), there is no distinction between phase head and non-phase head; each phrase head is a phase head. Consequently, the operation Phase Balance (see section 2.2.1) takes place at phrase level (and is hence also termed ‘Phrase Balance’):

(48) *Phrase Balance*

Every XP has to be balanced: For every feature  $[\bullet + \text{wh} \bullet] / [* + \text{wh} *]$  in the numeration there must be a potentially available feature  $[F]$  at the XP level.

### 2.3.2 Where There is Fire There is Smoke: Reflexes of Successive-Cyclic Movement as Phase Diagnostics

This section deals with the crucial question of how reflexes of successive-cyclic movement can be turned into a diagnostics for phase heads. In sections 2.1 and 2.2.2, I argued that in a system with cyclic spellout (and thus some sort of PIC), successive-cyclic movement follows from the necessity of “rescueing” material needed at later stages of the derivation out of the part of structure that is to be Transferred to the interfaces. Intermediate internal merge is thus a consequence of syntactic derivation by phase, and it is triggered by phase heads. The question now is, is it only triggered by phase heads, or can it also happen at the edge of non-phase heads? In what follows, I am arguing against the latter option.

It was argued for in section 2.2 that any operation that does the job of triggering movement to the edge is not conforming to the SMT at first sight as it violates at least one principle of syntactic derivations (i.e., the Economy Constraint on Merge, or the Inclusiveness Condition). However, movement of an item  $\alpha$  to the edge of a phase head X is indispensable as a last resort to “rescue” the derivation if there is a higher probe for  $\alpha$ , as the complement of X is inaccessible for any operation as soon as X is completed. Movement to the edge is thus conceptually necessary, and the operation yielding it must thus be allowed in an SMT-based system (however bitter this pill may be). However, note that the operation is conceptually necessary if and only if it prevents the derivation from crashing at a later stage. This condition is not fulfilled in the case of movement to the edge of a non-phase head N, as the material in the complement of N is still accessible when N is completed. In other words, movement to the edge of N is not a last resort to save the derivation in an emergency (where the emergency is imminent spellout). Consequently, successive-cyclic movement through the edge of non-phase heads is not conceptually necessary, and thus not motivated by the SMT. Successive-cyclic movement thus proceeds only through the edges of phase heads.

(49) *A property of successive-cyclic movement:*

Successive-cyclic movement proceeds through and only through the edges of phase heads.

(49) is the key observation for determining which heads are phase heads. The idea I am following is true to the maxim “Where there is fire there is smoke”: The morphological, syntactic and semantic phenomena appearing along the path of a long-moved element  $\alpha$  are triggered by the internal merge of  $\alpha$  at intermediate phase edges.

(50) *Null hypothesis on reflexes of successive-cyclic movement:*

Morphological, syntactic and semantic phenomena appearing along the path of a long-moved element  $\alpha$  are triggered by the internal merge of  $\alpha$  at intermediate phase edges.

More precisely, semantic path effects are yielded by reconstruction to intermediate copies/traces, while morphological and syntactic path effects are yielded by modifications of the syntactic or morphological environment, which are a consequence of movement to the edge. The conclusion is that reflexes of successive-cyclic movement are a means of diagnosing for phases: Reflexes on a head  $X$  which appear iff.  $X$  is on the path of a long-moved element  $\alpha$  are an indicator that  $X$ 's edge is an intermediate landing site for  $\alpha$ , and thus that  $X$  is a phase head.

## 2.4 Summary: Modelling Successive-Cyclic Movement

The outcome of this chapter is the fundamental background for the analysis of path effects as reflexes of successive-cyclic movement:

- Long movement proceeds by the successive-cyclic application of local movement steps. This follows from the system requirement that the current operation space of syntactic computations is restricted, as the system regularly Transfers portions of structure. Consequently, long movement cannot happen in one step, as any material that is needed later on must be made available again and again, as it would otherwise be lost by spellout.
- The constant availability is *a priori* not included into the current model – rather, movement to the edge seems to be prevented by a conspiracy of independently well-motivated constraints. This situation is resolved by including an availability requirement (=Phase Balance) into the model, which reports back an error whenever an element that is needed later on is not potentially available, and by allowing for the prioritisation and violation of constraints on movement as a last resort to rescue the derivation. Movement to the edge is either a non-feature-driven operation, or triggered by an inserted edge feature.
- Crucially, movement to the edge is only triggered when an item that is needed later on would otherwise be lost by spellout. Consequently, successive-cyclic movement proceeds only through phase edges.
- There are three types of approaches to the question which heads are phase heads: selective-static, dynamic, and minimal-static solutions. I argued that dynamic phase systems are potentially not optimal systems, as they allow for large phases (i.e., phases considerably larger than necessary to yield a successful derivation). Therefore, the phase system adopted here is a static phase system. The question of phasehood is approached on the basis of path effects, which are assumed to be triggered by movement to a phase edge; hence, path effects on a head X are an indicator that X is a phase head. This issue will be examined in the following chapters 3, 4 and 5.

# Chapter 3

## Semantic Reflexes

### 3.1 Reconstruction Effects

#### 3.1.1 Reconstruction to C

In some syntactic environments, an intermediate trace of fronted material is detectable as it can be shown that (parts of) this material is interpreted in a location between base-merge site and final landing site. I refer to this as *reconstruction*, though it is arguably an effect of a derivational application of binding conditions. Consider the following data (Lebeaux 1988, Barss 1986):

- (51) [John<sub>k</sub> thinks [<sub>CP</sub> that Bill<sub>i</sub> likes [this picture of himself<sub>i,\*k</sub>] ]]
- (52) [<sub>CP</sub> John<sub>k</sub> wonders [<sub>CP</sub> [which picture of himself<sub>i,k</sub>] Bill<sub>i</sub> likes \_\_\_\_]]
- (53) a. [<sub>CP</sub> [Which picture of himself<sub>i,k</sub>] does John<sub>k</sub> think [<sub>CP</sub> \_\_\_\_ that Bill<sub>i</sub> likes \_\_\_\_]]?
- b. [<sub>CP</sub> [Which picture of himself<sub>i,k</sub>] does Jane believe that John<sub>k</sub> thinks [<sub>CP</sub> \_\_\_\_ that Bill<sub>i</sub> likes \_\_\_\_]]?

In (51), the lower subject is the only possible antecedent for the anaphor in its base position. In (52), the anaphor starts out in a local relation with the lower subject *Bill*, but moves to a position where it is outside the binding domain of *Bill*, and in a local relation with the higher subject. The *i*-reading indicates that the anaphor can be reconstructed into its base position. The availability of the *k*-reading is surprising, as *himself*, which is originally merged in a local relation with *Bill*, seems to be able to relate to a new binder when it is located at the edge of the embedded CP.<sup>15</sup> (53a) and (53b) are the crucial examples. The anaphor is pied-piped to the matrix left periphery by the wh-operator. In this location it is not in a local relation with any possible antecedent ((53b) shows this even more

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15. Binding is even possible when the anaphor is at the edge of the lower IP, as (i) shows (Chomsky 1986b:173f.):

(i) Dorian Gray<sub>i</sub> thought [<sub>CP</sub> that [<sub>IP</sub> [pictures of himself<sub>i</sub>] were on sale ]]

acutely than (53a)). It is also possible for the anaphor to be bound by a higher object:

- (54) [ [Which pictures of himself] did Mary tell John [<sub>CP</sub> that she liked \_\_ ] ] ?

The reflexive must thus be reconstructed into a position in which it is in a local relation with its respective antecedent. That *himself* can be bound by the lower subject shows that it can be reconstructed into its base position.

However, there is a *k*-reading, too, in (53). In this reading the anaphor must be reconstructed to a position where it is in a local relation with *John*, but not with *Bill*. This is evidence in favour of the view that the constituent ‘which picture of himself’ has an intermediate landing site in just such a position. The observation that the anaphor is in a relevant local relation with the matrix object suggests that the edge of embedded C is this intermediate landing site.

### 3.1.2 Reconstruction to I

Abels (2003) argues that I is not an intermediate landing site. The argument is based on the following examples (Abels 2003:30):

- (55) a. [Which pictures of himself] did it seem to John [<sub>CP</sub> that Mary liked] ?  
 b. \* [Which pictures of himself] did Mary seem to John [<sub>IP</sub> to like] ?

The anaphor within the *wh*-expression must be reconstructed to a location where it is in a local relation with *John*. It cannot be reconstructed to its base position, as *Mary* would then intervene. The only possible location for reconstruction is thus the edge of the embedded clause. In (55a), the edge of the embedded clause is C, and the acceptability of the example suggests that reconstruction takes place to this position. In (55b), on the other hand, the edge of the embedded clause is I, and a possible reason for the unacceptability of this example is that the anaphor cannot reconstruct to the edge of I. If this is so, then a possible conclusion is that successive-cyclic movement does not proceed through the edge of I, which in turn means that I is not a phase head.

This is however not the end of the story. Consider examples (56) and (57).

- (56) a. Mary wants John [<sub>PRO<sub>John</sub></sub> to sell some pictures of himself]  
 b. [Which pictures of himself] did Mary want John [<sub>PRO<sub>John</sub></sub> to sell] ?  
 (57) a. \* Mary promised John [<sub>PRO<sub>Mary</sub></sub> to sell some pictures of himself]  
 b. ✓/\* [Which pictures of himself] did Mary promise John [<sub>PRO<sub>Mary</sub></sub> to sell]?

The minimal pair in (56) is regular: In (56a), the anaphor is in its base position within the embedded VP, where it is bound by <sub>PRO<sub>John</sub></sub>; likewise, in (56b), the anaphor can be reconstructed to its base position, where it is bound by <sub>PRO<sub>John</sub></sub>. (57a), too, behaves as expected: The anaphor in its base position cannot be bound by *John*, as the illicit binder *Mary* intervenes. (57b), however, does not behave as predicted. Following the argumentation in Abels (2003), (57b), in contrast to (56b), is expected to be unacceptable, as it needed to have an intermediate landing site at the edge of embedded I in order to be bound by *John*. I presented the

minimal pairs in (56) and (57) to a number of informants. While there was no variation in the judgements on (56) and (57a), the speakers significantly varied in their judgement of (57b): Only half of the speakers found (57b) ‘not good’; the other half rated it as ‘correct’. This suggests that for some speakers, the anaphor can be reconstructed to the edge of I.

A possible conclusion from these data is that the grammaticality judgements of (55) to (57) do not reflect possible reconstruction sites, but are due to an independent factor. Support for this view comes from data like (58):

- (58) a. Mary promised John<sub>i</sub> [PRO<sub>Mary</sub> to sell him<sub>i</sub> some pictures of himself]  
 b. ✓/\* [Which pictures of himself] did Mary promise John<sub>i</sub> [PRO<sub>Mary</sub> to sell him<sub>i</sub>] ?

(58a) behaves as expected in that the anaphor is in its base position, and is bound by its antecedent (=the indirect object). This suggests that (58b), too, should be fully acceptable: Even if the edge of I is not a possible reconstruction site, then reconstruction to the base position should still be possible. However, again 50% of the informants consulted (exactly those who accepted (57b), interestingly,) did not accept this example. I conclude from this discussion that an independent factor interferes with reconstruction in (55) to (58), so that the data in (55) do not speak against I as a possible reconstruction site. In addition, the acceptability of (57b) for some speakers suggests that reconstruction to the edge of I does take place.

### 3.1.3 Reconstruction to v

An argument for the edge of v as a reconstruction site is given in Fox (2000). The argument is based on examples of the following type (Lebeaux 1990, Fox 2000:162, Legate 2003:507):

- (59) a. [Which of the papers that he<sub>i</sub> gave Mary<sub>j</sub>] did every student<sub>i</sub> ask her<sub>j</sub> to read carefully?  
 b. \* [Which of the papers that he<sub>i</sub> gave Mary<sub>j</sub>] did she<sub>j</sub> ask every student<sub>i</sub> to revise?

This time, the fronted wh-expression contains two items for which the relevant binding conditions must be fulfilled: the pronoun *he*, which must be bound by *every student*, and the R-expression *Mary*, which must be unbound. Thus, in the acceptable example (59a), the wh-expression can neither reconstruct to its base position within the embedded VP, nor to a position higher than *every student*, as this would result in violations of principles C and B, respectively. The only location in the clause to which the wh-element can reconstruct while fulfilling all relevant binding conditions is a position higher than the matrix VP, where *her* is located, but lower than *every student*, which is a specifier of matrix I. It is thus reasonable to conclude that reconstruction takes place to the edge of matrix v, where the wh-expression is “trapped” between the two antecedents. If this is so, however, then the wh-element must have been temporarily located at the edge of matrix v at some point in the derivation. In (59b), in contrast, *she* is so high in

the structure, and *every student* so low, that there is no reconstruction site for the wh-expression in which the pronoun is bound by its antecedent, and at the same time the R-expression is free.

The same effect can be shown with unaccusative and passive *v* (Legate 2003:507f.); the argument works in the same way as for the transitive case. Again, the (a) example is the crucial example:

- (60) a. [At which conference where  $he_i$  mispronounced the invited speaker $_j$ 's name] did every organizer $_i$ 's embarrassment escape her $_j$ ?  
 b. \* [At which conference where  $he_i$  mispronounced the invited speaker's name $_k$ ] did it $_k$  escape every organizer $_i$  entirely?
- (61) a. [At which of the parties that  $he_i$  invited Mary $_j$  to] was every man $_i$  introduced to her $_j$ ?  
 b. \* [At which of the parties that  $he_i$  invited Mary $_j$  to] was she $_j$  introduced to every man $_i$ ?

In both (60a) and (60b), the wh-expression cannot reconstruct to its base position, as this would result in a principle C violation (*speaker* and *name*, respectively, must be unbound). However, the pronoun *he* must reconstruct to a position lower than its antecedent *every organizer*. The grammaticality of (60a) indicates that there is such a location. Given that *every organizer's embarrassment* is located at the edge of I, and *her* within the VP, this location should be the edge of *v*. In contrast, that example (60b) is ungrammatical shows that there is no position in the structure to which the wh-expression can possibly reconstruct without violating either principle C, or B. The passive examples in (61) are subject to the same rationale: (61a), is grammatical as the pronoun within the wh-expression is reconstructed to the edge of *v*; in (61b), there is no reconstruction site for the pronoun in which principle C is not violated due to the presence of the R-expression. The conclusion is that there is a reconstruction site for the pronoun, and thus an intermediate landing site for the wh-expression, at the edge of passive and unaccusative *v*.

More evidence in favour of *v* as a phase head comes from pair-list readings out of islands. Wh-questions containing a universal quantifier basically allow for two types of answers, single answers and pair-list answers (I leave a third kind, functional readings, aside). Some examples from (Agüero-Bautista 2007) are given in (62).

- (62) a. [Which book] $_i$  did each professor say that Pete read  $t_i$ ? (SA, PL)  
 b. [Which book] $_i$  did Pete say that each professor read  $t_i$ ? (SA, PL)  
 c. [Which professor] $_i$   $t_i$  said that Pete read each book? (SA, \*PL)

A felicitous answer to all the questions in (62) is, e.g., 'Each professor said that Pete read *The Riddle of the Sands*'. This is a single answer. There is, however, a second reading, which is only available in (62a) and (62b). In this second reading, each of the professors reports about a different book, e.g., 'Professor X said that Pete read *The Living Reed*, professor Y said that Pete read *Judge Dee*, and professor Z said that Pete read the *Feng Shui Almanac*'. This answer is a list of pairs; the relevant reading of the question is thus called 'pair-list reading' (Engdahl 1980,



Groenendijk and Stokhof 1984). Crucially, pair-list readings require that the universal quantifier that induces this reading must c-command the trace of the wh-phrase.

(63) *Condition on pair-list readings (Chierchia 1993):*

The universal quantifier of the generator must c-command the trace of the wh-phrase.

This accounts for the unavailability of the pair-list reading in (62c): *each book* does not c-command the wh-item at any stage of the derivation.

Agüero-Bautista (2004, 2007) discusses pair-list interpretations in the context of extraction out of weak islands. The relevant data are given in (64).

- (64) a. [Which (particular) problem]<sub>i</sub> do you wonder [whether every student solved t<sub>i</sub>]? (SA, \*PL)  
 b. [Which (particular) problem]<sub>i</sub> does each professor wonder [whether you solved t<sub>i</sub>]? (SA, PL)

In both examples, the D-linked wh-phrase *which (particular) problem* can be extracted out of the weak island. Both examples allow for a single answer reading, but only (64b) has an additional pair-list reading (compare (64a) to (62b); see also Giorgi and Longobardi 1991). Agüero-Bautista (2007) accounts for this difference by means of a restriction on reconstruction into weak islands: If an element moves out of an island, then reconstruction cannot take place to a position inside the island.

(65) *A condition on reconstruction (Agüero-Bautista 2007):*

Reconstruction cannot take place to a position inside an island.

(63) is still valid: Pair-list readings presuppose a universal quantifier c-commanding a wh-trace. In (64a), the universal quantifier is inside the island. According to (65), however, portions of structure inside islands are inaccessible for reconstruction. There is thus no possible reconstruction site for which both (63) and (65) are fulfilled; the pair-list reading is therefore unavailable. In example (64b), on the other hand, the quantifier is located structurally higher than the island. The wh-expression can therefore reconstruct to a position that is c-commanded by *each professor*, but at the same time outside the island. (64b) therefore allows for a pair-list reading. The location of the reconstruction site must be the edge of either V or v, as the c-commanding quantifier is contained in a specifier of I.

### 3.2 Elliptic Repair of Island Violations

Movement out of islands generally leads to ill-formed structures, but the derivation can be “repaired” if the IP containing the island is elided (=‘sluicing’; Ross 1969, Chomsky 1972, Lasnik 1999, 2001, Merchant 2001). This is illustrated in the following examples from Ross (1969), cited from Fox and Lasnik (2003):

- (66) a. I believe the claim that he bit someone, but they don’t know who (\*I believe the claim that he bit) (Complex NP Constraint)  
 b. She kissed a man who bit one of my friends, but Tom doesn’t realize which one of my friends (\*she kissed a man who bit). (Complex NP Constraint, relative clause island)  
 c. Irv and someone were dancing together, but I don’t know who (\*Irv and were dancing together) (Coordinate Structure Constraint)  
 d. That he’ll hire someone is possible, but I won’t divulge who (\*that he’ll hire is possible). (Sentential Subject Constraint)

Elliptic repair can be taken to be an argument for an intermediate landing site at the edge of I. The relevant minimal pair is given in (67).

- (67) a. \* They want to hire someone who speaks a Balkan language, but I don’t remember which<sub>i</sub> they do <want to hire someone who speaks t<sub>i</sub>>  
 b. They want to hire someone who speaks a Balkan language, but I don’t remember which<sub>i</sub> <they want to hire someone who speaks t<sub>i</sub>>

Both examples involve movement of the wh-element ‘which’ out of a relative island. The central observation, which goes back to Ross (1969), is that VP ellipsis (example 67a) does not save the derivation, but sluicing, which deletes a larger portion of structure, does (example 67b); see also Chomsky 1972, Chung et al. 1995, Merchant 2001, Fox and Lasnik 2003).

The analyses proposed in Chomsky (1991), Chomsky and Lasnik (1993), Merchant (2001) agree in that a violation of a syntactic constraint are marked on the trace of the illegitimately moved category. The crucial illicit step in island violations is moving the wh-element out of the island. The result of this unallowed movement is that further movement of the wh-element leaves behind traces that are ‘illicit’. The presence of an illicit trace results in an ill-formed structure. The derivation can however be rescued if any “trace of the crime” is wiped out, i.e., if illicit traces are eliminated by ellipsis. Merchant (2001) argues that the ellipsis in (67a) is vP-ellipsis, and that only full XPs can be elided. If the argumentation is on the right track, then the ungrammaticality of (67a) shows that the offending trace is not eliminated by vP-ellipsis and thus located higher than the edge of v. It must, on the other hand, be located somewhere below the CP, as it would otherwise not be eliminated by sluicing. The conclusion is thus that the offending intermediate trace is located at the edge of I.

Interestingly, the analysis proposed in Fox and Lasnik (2003) is also based on the idea that sluicing rescues an otherwise non-converging derivation, but works in exactly the opposite way: The ungrammaticality of (67a) is not due to an offending trace, but to an instance of non-successive-cyclic movement that is not eliminated. In short, the analysis is based on a parallelism condition on deletion that must be fulfilled between the non-deleted and the deleted clause. This condition can only be met when the *wh*-movement in the sluicing-clause proceeds in a non-successive-cyclic fashion. Fulfilling the parallelism condition, however, results in a violation of locality. This constraint conflict is resolved in favour if the parallelism condition: The *wh*-phrase is long-moved, and the portions of structure involved in the offending movement operation are elided. For data like (67), this is yielded by sluicing.

This analysis delivers arguments against intermediate traces of *wh*-movement between C and v. This conclusion can however not be upheld if the analysis is set in a phase-based derivation. Let me demonstrate the problems that arise if the approach is implemented with phases. Cyclic spellout has the effect that movement *must* proceed phase by phase. There is no independent locality condition that could be violated; rather, phases yield strict locality: If an element is not moved to the edge, it is lost for the rest of the derivation. An exceptional movement operation that spans over more than one domain can only be modelled if phase extension (or phase *sliding*, or simply spellout delay, for that matter) is allowed. Remember, however, that in a dynamic phase model, phases are extendable by definition – hence, even if I is not an intermediate landing site in cases of elliptic repair of island violations, then this makes no prediction about the phasal status of I in other cases.

This is not to say the the Fox and Lasnik analysis is incompatible with phases. What follows is not part of the main line of argumentation, but let me briefly work out how the analysis can be implemented with phases. A phase-based system should be strictly derivational and does not involve look-ahead. Thus, phase extension (or phase *sliding*, or simply spellout delay, for that matter) must be triggered by the parallelism condition, which has the effect that spellout delay takes place in the sluicing clause, so that the *wh*-item is moved out of the island in one fell swoop.<sup>16</sup> There is a potential problem here: Paradoxically, phase extension itself, which applies in order to create parallel structures, violates the parallelism condition, as the two clauses end up with different phasal patterns. This seems fatal at first sight, but will eventually be the key for the system to work, as we will see in a short while. In order to faithfully remodel Fox and Lasnik’s analysis, spellout delay needed to yield an illicit configuration that can only be repaired by ellipsis. In the original analysis, the illicit configuration is a locality violation. I already put forth that locality violations do not come up in the first place in a phase-based system, as there is no independent locality principle here – locality

16. Possible implementation: The concept of Phase Balance (section 2.2.1) could be adapted to yield this result if the non-elided clause is already in the workspace. At the point when the phase is completed, the system looks into the workspace. It detects the clause that it has to parallel, and consequently delays spellout.

is automatically yielded by cyclic spellout. In addition, if the system allows for a last-resort phase extension to rescue the derivation, then spellout delay (which remodels the non-successive-cyclic movement step) cannot be a forbidden operation. Hence, ellipsis would not repair an illicit operation anymore. The original constraint conflict – parallelism versus locality – can therefore not be kept in a phase system. Now remember that spellout delay does indeed yield an illicit configuration, namely, a new violation of the parallelism condition (due to the two clauses now having different phase boundaries). A crucial assumption is that the system does not notice the new violation of parallelism at the stage of the derivation when phase extension takes place; rather, the violation is detected when the next higher phase, the CP, is completed and the phase is balanced again. When the parallelism violation is then finally detected, then the derivation is rescued by eliding C's complement (= sluicing), which is the desired result.

Coming back to the main line of argumentation, the conclusion is that if the basic line of argumentation in Chomsky (1991), Chomsky and Lasnik (1993) and Merchant (2001) is on the right track, then the data presented in this section are evidence in favour of the view that the edge of I is an intermediate landing site.

### 3.3 Reconstruction and Ellipsis: Pair-List Readings with Sluiced Islands

Chung et al. (1995) observe that sluicing allows for pair-list readings. This is illustrated in (68).

- (68) Every criminal abducted a certain victim. Tell me [which victim]<sub>i</sub> <every criminal abducted t<sub>i</sub>> (SA, PL)

Taking this observation as a starting point, Agüero-Bautista (2007) puts forth a new argument for intermediate landing sites. The key observation is that constructions involving elliptic repair of island violations allow for a pair-list reading (see (69), crucial example: (69b))

- (69) a. Bill asked someone whether each candidate should bribe a senator. Tell me [which senator]<sub>i</sub> <Bill asked someone [whether each candidate should bribe t<sub>i</sub>]> (SA, \*PL)  
 b. Each candidate asked someone whether Bill should bribe a senator. Tell me [which senator]<sub>i</sub> <each candidate asked someone [whether Bill should bribe t<sub>i</sub>]> (SA, PL)

In (69a), the quantifier is located inside the weak island. In order to yield the pair-list reading, the *wh*-expression needs to be reconstructed to a position c-commanded by the quantifier (to fulfill (63), the condition on pair-list readings), but outside the island (to fulfill (65), the condition on reconstruction). But with the quantifier occurring inside the island, there is no such position available, thus the pair-list reading is unavailable. In (69b), on the other hand, the quantifier occurs outside the island. Again, in order to yield the pair-list reading, the *wh*-expression must reconstruct to a position c-commanded by the quantifier, but outside the island. This time there is such a position: If the quantifier is located at the edge of I, then the most probable reconstruction site is the edge of *v* or *V*. There is one potential caveat to this argumentation, which is pointed out by den Dikken (2006): The data can also be taken to be evidence in favour of I as a phase head, with the intermediate landing site detected being the edge of I. However, note that this presupposes that either the *wh*-phrase has to be tucked in below the external argument, or the external argument must undergo quantifier raising. (61b), on the other hand, would not converge even if QR could take place (which it cannot for independent reasons; see den Dikken (2006) and the literature cited therein), as the antecedent of the R-expression, *she*, is still too close to *Mary* – if reconstruction takes place to the edge of I, then both would be located at the same edge (Fox 1999:174).

### 3.4 Summary: Semantic Evidence for Phase Edges

The reconstruction effects provide evidence for the phasal status of C (CP reconstruction), I (binding of pronouns and anaphors) and v (vP reconstruction, pair-list readings, pair-list-readings with sluiced islands). The elliptic repair data can be taken to be evidence that the edge of I is a phase edge. Finally, the data involving pair-list readings with sluicing showed that the edges of v (or V) are phase edges.

# Chapter 4

## Morphological Reflexes

The goal of this chapter is to account for morphological reflexes of successive-cyclic movement. The first language I look at in detail is Chamorro. Section 4.1 gives an overview of the data. The analysis is then developed in section 4.2. The consequences of the new analysis are discussed in 4.2.8. Section 4.3 then examines a number of other languages showing path effects (Irish, Kikuyu), and analyses the data. The account of Chamorro will be the most detailed one, though; once it is clear how the analysis works, it is easy to apply it to other cases of morphological path effects.

### 4.1 Data: Wh-Agreement in Chamorro

#### 4.1.1 Introduction

In Chamorro there is a special morphological marking that appears on and only on all verbs on the path between a wh-element and its trace, no matter how complex the structure is (Chung 1998:234ff.). A first example from Chung (1998:236) is given in (70).

- (70) a. Ha-fa'gasi si Juan i kareta  
3SG-washed UNM Juan DEF car  
'Juan washed the car'
- b. Hayi f<um>a'gasi i kareta?  
who <UM>wash DEF car  
'Who washed the car?'

In the declarative clause (70a), the verb inflects for person and number. When the subject is extracted, as in (70b), then the person and number marker disappears, and a “special” marker *um* appears on the verb (which is provisionally glossed as ‘UM’; the nature of this marker is discussed in section 4.2.4).

The data section explores the contexts where this “special” marking shows up: Subsection 4.1.2 gives an overview of the regular verbal morphology (i.e., the morphology of verbal predicates in non-extraction contexts); the following two

subsections explore the verbal morphology in the contexts of extraction (4.1.3) and long movement (4.1.4). The analysis will then be developed in section 4.2.

#### 4.1.2 Morphology of Verbal Predicates \ No Extraction

In non-extraction contexts, verbal predicates agree with their highest argument (“subject”). The paradigm of verbal markers is shown in table 3 (Chung 1998:26f.).

Table 3

Table 3

TRANSITIVE [+V] PREDICATES				INTRANSITIVE [+V] PREDICATES			
	REAL	IRREALIS			REAL	IRREALIS	
1 SG	hu-	(bai)	hu-	1 SG	-um-	(bai)	hu-
2 SG	un-	un-		2 SG	-um-	un-	
3 SG	ha-	u-		3 SG	-um-	u-	
1 DU IN	ta-	(u-)ta-		1 DU IN	-um-	(u-)ta-	
1 DU EX	in-	(bai)	in-	1 DU EX	-um-	(bai)	in-
2 DU	in-	in-		2 DU	-um-	in-	
3 DU	ma-	u- ma-		3 DU	-um-	u-	
1 PL IN	ta-	(u-)ta-		1 PL IN	man-	(u-)ta-fan-	
1 PL EX	in-	(bai)	in-	1 PL EX	man-	(bai)	in- fan-
2 PL	in-	in-		2 PL	man-	in- fan-	
3 PL	ma-	u- ma-		3 PL	man-	u- fan-	

Chamorro  
Subject  
agreement

Two observations can be made at this point. Firstly, subject agreement on the verb varies according to the transitivity of the predicate: In realis mood, transitive verbs agree in person and number, whereas intransitive verbs display a completely different set of markers, which is only sensitive to a  $\pm$ plural distinction. In irrealis mood, intransitive verbs differ from transitive verbs in that they show an additional marker *-fan* in the plural. Secondly, there is an asymmetry in the syncretism pattern: Dual is syncretic with singular in intransitive realis contexts, and with plural in all other contexts.

#### 4.1.3 Verbal Inflection in Clause-bound Dependencies

The verb encodes the type of verbal argument that is extracted (Chung 1998:236f.). The verbal paradigm in the context of *wh*-extraction is given in table 4.<sup>17</sup>

Table 4

	TRANSITIVE	INTRANSITIVE
WH <sub>NOM</sub>	realis: <i>-um-</i>	— (=no special inflection)
WH <sub>NOM</sub>	irrealis: —	—
WH <sub>OBJ</sub>	opt. nomlz + <i>-in-</i>	—
WH <sub>OBL</sub>	nominalisation	unergative: nomlz
WH <sub>OBL</sub>	nominalisation	unaccusative: nomlz + opt. <i>-in-</i>

17. Obj= direct and indirect objects; obl= oblique complements of intransitive predicates, instruments, subcategorised comitatives.



The extraction morphology overwrites the regular subject-verb markers.<sup>18</sup> This does however not happen in all contexts; rather, the “special” morphology is sensitive to the argument status of the extracted element, transitivity, and mood: The special exponence is visible if a WH<sub>NOM</sub> argument is extracted from a realis transitive predicate, in the context of WH<sub>OBL</sub>-extraction, and optionally if a WH<sub>OBJ</sub> argument is extracted. In all other contexts (i.e., WH<sub>NOM</sub>-extraction from irrealis or intransitive predicate, optionally with WH<sub>OBJ</sub>-extraction), the predicate exhibits the regular forms of subject agreement (indicated by ‘—’).

The table also shows that there is no uniform “wh-agreement” marker: When a subject is extracted, then the marker *-um-* appears; in all other contexts, the verb is nominalised. In addition, a marker *-in-* appears in two contexts: Firstly, it must appear when the nominalisation option is chosen to mark WH<sub>OBJ</sub>-extraction; secondly, it can appear when a WH<sub>OBL</sub>-element is extracted from an intransitive unaccusative predicate. The term “special morphology” is of course not meant to suggest that nominalisation and the infixes *-um-* and *-in-* do not appear in other contexts in this language; they are “special” in that they are unexpected in transitive verbal predicates. Some examples from Topping (1973), Chung (1998) are given in (71) to; the first two pieces of data are repeated from (70) above.

- (71) a. Ha-fa’gasi si Juan i kareta  
 3SG-washed UNM Juan DEF car  
 ‘Juan washed the car’ (Chung 1998:236; tr rl, decl)
- b. Hayi f<um>a’gasi i kareta?  
 who <UM>wash DEF car  
 ‘Who washed the car?’ (tr real, WH<sub>nom</sub>)
- c. Hafa f<in>a’gasése-nña si Juan pära hagu?  
 what <IN>wash~CON-3SG.POSS UNM Juan for you  
 ‘What is Juan washing for you?’  
 (Lit. ‘What is Juan his wash(ing) for you?’) (tr rl, WH<sub>obj</sub>)
- d. Hafa pära fa’gase-mmu ni kareta?  
 what FUT wash-2SG.POSS OBL car  
 ‘What are you going to wash the car with?’  
 (Lit. ‘What will be your wash(ing) of the car?’) (tr irr, WH<sub>obl</sub>)
- (72) a. Pära u-bendi yu’ si Carmen lepblu  
 FUT 3SG.IRR-sell me UNM Carmen books  
 ‘Carmen is going to sell me some books’ (Chung 1998:386; tr irr, decl)
- b. Hayi pära u-bendi yu’ lepblu?  
 who FUT 3SG.IRR-sell me books  
 ‘Who is going to sell me some books?’ (tr irr, WH<sub>nom</sub>)

18. The infix *-um-* appears before the first vowel, even when the stem begins with a consonant cluster (Yu 2003). Likewise, *-in-* is inserted before the first vowel. The two infixes have phonologically conditioned allomorphs: *-um-* appears as a prefix *mu-* when the initial consonant of the verbal stem is /n/, /ñ/ or /ŋ/ (Topping 1973:185). Similarly, there are cases where *-in-* appears as the prefix *ni-*.

- (73) a. Hayi k<um>á~kati?  
 who <UM>CON~cry  
 ‘Who is crying?’ (Chung 1998:184; itr irr, WH<sub>nom</sub>)
- b. Hafkao malago'-mu?  
 what.EMP want-2SG.POSS  
 ‘What do you want?’ (Topping 1973:157; itr rl, WH<sub>obl</sub>)<sup>19</sup>

Examples (71c) and (71d) involve nominalisation. This is visible in two ways: Firstly, a possessive pronoun appears instead of the regular verbal subject marker; secondly, the direct object occurs with the marked form of the determiner (*ni* in (71d); Chung 1998:242).<sup>20</sup> The difference between nominalised and non-nominalised structures can be best illustrated by cases of optional nominalisation, as with WH<sub>obj</sub>-extraction:

- (74) a. Hafa si Maria ha-sangani si Joaquin?  
 what UNM Maria 3SG-say.to UNM Joaquin  
 ‘What did Maria tell Joaquin?’ (tr, WH<sub>obj</sub>)
- b. Hafa si Maria s<in>angane-nña as Joaquin?  
 what UNM Maria <IN>say.to-3SG.POSS OBL Joaquin  
 ‘What did Maria tell Joaquin?’  
 (Lit. ‘What is Maria her saying to Joaquin?’) (Chung 1998:242; tr, WH<sub>obj</sub>)

(74a) is the variant without nominalisation: The verbal agreement marker is the regular person-number marker, and the direct object appears with the unmarked determiner. Example (74b) is the variant involving nominalisation. Here the subject agreement marker is a possessive pronoun, and the direct object is marked by an oblique determiner. In addition, the infix *-in-* appears on the verb.

The very same pattern of “wh-agreement” also occurs with focus and relativisation. (75) is an example of NP<sub>nom</sub>-extraction in a constituent question (75b) and focusation (75c). Both operations yield identical marking on the verb. In (76), it is an object NP that is focused; the verbal inflection is identical to wh<sub>obj</sub>-extraction (here the option without nominalisation is chosen).

- (75) a. Si Pedro hatsa i lamasa  
 UNM Pedro lifted DEF table  
 ‘Pedro lifted the table’ (Topping 1973:185)
- b. Hayi h<um>atsa i lamasa?  
 who <UM>lifted DEF table  
 ‘Who lifted the table?’

19. Note that *want* in Chamorro is an intransitive taking an oblique complement.

20. There are three cases in Chamorro, which are sensitive to noun type and realised as stressless particles: Unmarked, oblique, and local case (Chung 1998:50):

Table 5

*Chamorro*  
*Case markers*

	UNMARKED	OBLIQUE	LOCAL
COMMON NOUN	–	ni	gi
PROPER NOUN	si	as	gias
PRONOUN	–	nu	giya

- c. Si Pedro h<um>atsa i lamasa  
 UNM Pedro <UM>lifted DEF table  
 ‘It was Pedro who lifted the table’

- (76) Esti na istoria sessu nana-hu ha-sangani yu’  
 this LINK story often mother-1SG.POSS 3SG-say.to me  
 ‘It was this story that my mother often told me’ (Chung 1998:269)

Examples of relativisation are given in (77). In (77a), the subject (*taotao*) is extracted from a transitive predicate; the verbal inflection parallels that of *wh<sub>nom</sub>*-extraction in that the exponent *-um-* appears. In (77b), the object (*saga*) of the embedded clause is relativised.<sup>21</sup> The predicate is identical to that appearing with *wh<sub>obj</sub>*-movement (nominalisation plus infix *-in-*). The relativisation of a direct object is shown in (77c). Here the predicate is not nominalised, and the regular person-number marking appears.

- (77) a. Ma-li’i’ [i [hägas p<um>oksai siha ] na taotao ]  
 3PL-see [DEF [long.ago <UM>nurture them ] LINK people ]  
 ‘They got to see the people who had nurtured them in the past’  
 (Cooreman 1983:167, quoted from Chung 1998:214)
- b. Esta ti siña hao la’la gi [[p<in>e’lo-kku ] na saga ]  
 already not can you be.alive LOC [[<IN>put-1SG.POSS ] LINK place ]  
 ‘You can no longer live in the place where I put you’  
 (Cooreman 1983:103, quoted from Chung 1998:214)
- c. Gaigi gias Juan [ädyu i lepblu [ni yä-hu ]]  
 there.is LOC Juan [that DEF book [COMP like-1SG ]]  
 ‘John has the book that I like’ (Chung 1998:215)

The examples used in the analysis are all cases of *wh*-movement, and I refer to the movement operation and the involved elements as ‘*wh*-movement’, ‘*wh*-element’, etc. This is for the ease of exposure, and also due to the lack of a generic term for *wh*-movement, focus movement and relativisation ( $\bar{A}$ -movement would be misleading, as it suggests that the *A*/ $\bar{A}$ -distinction plays a role in the analysis, which is not the case – the special morphology also shows up with *A*-movement). It should be kept in mind that the analysis also carries over to focussation and relativisation. Topicalisation, on the contrary, does not involve any special marking. I discuss this issue in section (4.2.5.8), arguing (following Chung 1998) that topicalisation does not involve movement.

#### 4.1.4 Verbal Inflection in Long Dependencies

When long movement takes place, then the special morphology appears on every verb on the path between extraction site and final landing site (however note that it always follows the paradigm in table 4; it does, for example, not occur on irrealis predicates). Crucially, the higher verbs do not register the argument status of the

21. Note: in Chamorro, the location is a non-oblique complement of the verb *put*.



- b. Ni háyiyi ha' interes-ña si Dolores [pära  
 not anyone EMP be.interested-3SG.POSS UNM Dolores [FUT  
 OBL-NMLZ  
 asuddä-ña ]  
 meet-3SG.POSS ]  
 OBL-NMLZ  
 'Dolores is interested in meeting *no one at all*'

- (80) Taya' [[s<in>nedda'-mami ] hugeti [ni pära gandu-nmami ]]  
 EXIST.NEG [[<in>find-1PL.EXCL ] toy [COMP FUT play-1PL.EXCL ]]  
 OBJ-in OBL-NMLZ

'There were no toys that we could play with that we could find'

(Chung 1998:216)

## 4.2 Analysis

In this section I present the new analysis of path phenomena in Chamorro. At first I discuss several previous analyses (4.2.1), then I lay out the basic ideas of the new analysis (4.2.2). Subsection 4.2.3 then introduces the theoretical background for the new analysis. 4.2.4 contains the morphological analysis of the inflectional markers involved in “wh-agreement”. In 4.2.5, I examine the verbal inflection in contexts of local extraction, and 4.2.6 brings all the strings together in the analysis of verbal inflection under long movement. The analysis is summarised and rounded up in 4.2.7 and 4.2.8.

### 4.2.1 Existing Analyses

According to Chung (1998), the special verbal morphology in the context of wh-extraction is case agreement with an  $\bar{A}$ -bound trace (=“wh-agreement”); seeming syncretisms with other verbal forms (passive, control) are mere homonymies. Wh-agreement is a special type of agreement specific to Chamorro.

There are two caveats to this analysis that I would like to bring forth. Firstly, the system argued for in Chung (1998) does not recognise obvious syncretisms: *-um-* as a subject-wh marker, infinitive marker, nominal actor marker and actor focus marker are analysed as mere homonyms; likewise, *-in-* as object-wh marker, verbal and nominal passive marker and object focus come out as homonyms. This is a “rather undesirable proliferation of homophonous morphemes in the language” (Dukes 1992).<sup>22</sup>

This caveat is put aside in Chung (1998, 1994) by pointing out that the contexts in which the syncretic markers appear (extraction, control, passive) are so distinct that a single marker would not fit into both. For example, embedded predicates of control constructions, where the marker *-um-* appears, are infinitives, whereas regular  $\text{wh}_{\text{nom}}$ -extraction clauses are unquestionably finite. However, marker syncretism does not mean that the contexts in which one and the same marker appears must be nearly identical. If a marker  $\alpha$  is underspecified, then it may well be the case that it is the best-matching marker in two entirely different contexts A and B – it is only necessary that A and B share at least one morpho-syntactic feature for which  $\alpha$  is specified. Alternatively,  $\alpha$  may even fit into both contexts if A and B do not share any features. This can happen when  $\alpha$  is maximally underspecified, and the insertion of more specific markers into A and B is blocked for some reason. Topping (1973) hints at possible specifications for the markers *-um-* and *-in-*:

“It is very probably that the infixes *-um-* in agentive nominalisation, agent focus and control] are actually one and the same. [...] it is possible to consider both of the infixes an ‘action’ infix, or something like that, because when it is used, the emphasis is on the actor or the action.” (Topping 1973:185)

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22. Most of these data are presented in detail at a later point, namely in sections 4.2.4 (nominalisation), 4.2.5.4 (control) and 4.2.5.7 (passive); familiarity with them is not a prerequisite to follow the argumentation at this point.

“It appears that all of the forms which include the infix *-in-* are somehow related to its primary function which we are calling *Goal Focus*. This means that whenever the infix *-in-* is used, the ”focus“ [...] is on the goal of the action.” (Topping 1973:188)

The desideratum is to analyse syncretic markers in a uniform way and so postulate as little homonymy as possible. Adding to this, there does seem to be an underlying function for the markers *-um-* and *-in-*, namely agent and patient voice, respectively, the conclusion being that Chamorro does, after all, have a Philippine-type voice system.

The second point of criticism is that agreement with traces is banned in a strictly derivational system, as it violates the Strict Cycle Condition: When an element  $\alpha$  is extracted out of the domain of a head H, then the trigger is always a probe that is higher in the structure than H. Neither H nor  $t_\alpha$  can therefore act as probes anymore. A derivation in which H now agrees with  $t_\alpha$  is impossible, as it is counter-cyclic.

In the analysis put forth by Dukes (1992), the “special morphology” are derivational affixes that indicate that a verb has pre-syntactically undergone a derivation process. The result of this morphological process is that the argument structure of the predicate changes in such a way that the “movee” (or rather, the gapped element) is advanced into the subject position on the SUBCAT list.

In Kaplan (2005), there is no successive-cyclic wh-movement. The seeming intermediate reflexes are cases of resumption under long movement (i.e., long movement in “one fell swoop”). This is a version of FORM CHAIN (Chomsky 1993, Takahashi 1994, Boeckx 2003). There are two reasons why this kind of approach is incompatible with minimalist grammars: it is counter-cyclic, and it does not offer a principled reason for the existence of path phenomena; this is discussed in detail in section 2.1.

#### 4.2.2 Basic Ideas of the New Analysis

The new analysis rests upon three basic ideas. The first starting point is the Syncretism Principle.

(81) *Syncretism Principle* (Alexiadou and Müller 2008, Müller 2008b):

Identity of form implies identity of function (within a certain domain, and unless there is evidence to the contrary).

Principle (81) yields the null hypothesis that the syncretisms in the verbal morphology of Chamorro are not cases of homonymy. Rather, syncretic markers in a derivation A and a derivation B are evidence that A and B are derivationally related, so that the same marker fits in both contexts.

(82) *Null Hypothesis for Morphological Analysis*:

Syncretic markers in a derivation A and a derivation B are evidence that

A and B are derivationally related, so that the same marker fits in both contexts.

The second toehold is the following characterisation of the agreement system of Chamorro:

Chamorro is a Philippine-type language (PTL) which is in the process of augmenting its Philippine style voice-marking system. A recent addition to the language is a transitive sentence type that bears no voice morphology. [...] The exceptional morphological trait in Chamorro is [...] the disappearance of [the voice-marking] morphology in transitive main clauses (Donohue and Maclachlan 2005:121).

The basic insight is that there seem to be two competing agreement systems in this language: an Austronesian-style voice marking system (markers *-um-*, *-in-*, *man-*, *fan-*), and a person-number marking system. The new idea is that the predicate registers both kinds of agreement, but in most syntactic contexts only one of the two agreement systems surfaces (though they can in principle co-occur, as in intransitive irrealis plural).

The third central idea, which resumes the argumentation in section 2.3.2, is that the morphological phenomena appearing along the path of a long-moved item  $\alpha$  are triggered by  $\alpha$  being internally merged at intermediate phase edges (*Null Hypothesis on Reflexes of Successive-Cyclic Movement*; see (50) on page 35). The new idea is thus that there is no “wh-agreement” in the sense that a verbal head agrees with wh-elements passing, or with wh-traces. Rather, the marker alternation is due to both the syntax and the morphology: In the syntax, the feature set of the probing phase head V/v/I is impoverished when material is extracted to the edge. In the morphology, specificity-driven vocabulary insertion blocks the insertion of more specific markers (=person-number markers) when impoverishment has taken place, so that a less specific exponent (=voice marker) is inserted then. This idea is developed in detail in section 4.2.3.4.

### 4.2.3 Theoretical Background

#### 4.2.3.1 Argument Structure and Verb-initial Order

The underlying argument structure is such that v assigns internal case, and I assigns external case. The UTAH is only partially at work: Although NP<sub>ext</sub> is always base-merged structurally higher than the internal arguments, there is variation as to which head base-merges the arguments. The external argument can therefore be base-merged at the edge of v or at the edge of V (in which case it is actually an internal argument; I will however retain the term ‘external argument’). Nevertheless, transitive v always has an [ $\bullet$ N $\bullet$ ]-feature. Thus, when NP<sub>ext</sub> is base-merged by V, it is internally merged again at the edge of v by v’s [ $\bullet$ N $\bullet$ ]-feature. In intransitive contexts, the single argument is always base-merged in the VP (see Sabel 2002 for a similar proposal). The difference between unergative and unaccusative structures is the following: In unergative predicates, v has a [voice:+ag] feature,



and V has no [voice:–ag] feature; in unaccusative structures, on the other hand, both heads contain a voice feature, but V’s [voice:–ag] feature is assigned to the argument NP; v’s [voice:+ag] feature is present, but no element agrees with it in the course of the derivation.

Remember from the data sections that subject agreement on the verb varies according to the transitivity of the predicate. I implement this observation by assuming that argument-introducing [ $\bullet$ N $\bullet$ ]-features have a non-deleteable counterpart [arg] (cf. Sternefeld 2006). These [arg] features are notated as clusters when V-to-v movement takes place. Thus, the feature set of an intransitive verb has the transitivity value [arg], the feature set of a transitive verb ends up with the value [arg-arg] (one [arg]-feature contributed by V, the other by v), and the head of a ditransitive predicate is specified by [arg-arg-arg]. Note that this clustering has no real theoretical status, and there is nothing crucial that depends on it; its purpose is to facilitate the legibility.

Chamorro is a verb-initial language. I assume, following Chung (1998), that the verb-initial structure is derived by V-to-I movement. Furthermore, the property of having a structure-building [ $\bullet$ N $\bullet$ ] feature is not inherent to I; though there may be an EPP requirement in Chamorro, there is no EPP feature proper on I in this language (see also e.g. Alexiadou and Anagnostopoulou 2001). The information “subject is present” is already brought into the structure by v agreeing with the “subject” argument in voice. v carries  $\phi$ -features.

Finally, I assume that mood in Chamorro is located lower in the structure than assumed by Cherny (1992) and Watanabe (1996), namely in the domain of v.

#### 4.2.3.2 *Heads and Head Movement*

A central assumption of this analysis is that syntactic heads are bundles of unordered features, which has been widely assumed for morphological features (Jakobson 1936, Bierwisch 1967, Kiparsky 2001; the alternative being feature geometries), and for the operation Merge [ $\alpha, \beta$ ] (where  $\alpha$  and  $\beta$  are unordered; Chomsky 1995). This notion of head also corresponds to feature value matrices in Lexical-Functional Grammar (Kaplan and Bresnan 1982). However, there is internal structure in that the individual features that make up the head are decomposable into subsets (or feature geometries), and the features contained in those subsets (e.g. [+sg –pl]) are recognisable as belonging to a specific subset. In addition, several features can be dealt with simultaneously in Agree or Merge operations (this is equivalent to what happens during vocabulary insertion in post-syntactic morphology models like Distributed Morphology; see Halle and Marantz 1993, 1994).

In this analysis, head movement is an operation by which the features of the goal are added to the feature set of the probe; attraction of a feature leads to pied-piping of the whole feature bundle of the goal (Roberts 2006, 2008*a,b*). This fusion-style type of head movement avoids the c-command problem with head movement by

adjunction, and has the effect that all feature of an active head are accessible (as opposed to e.g. Müller (2008c), where due to a feature hierarchy, only one feature of an active head is accessible at a time).

#### 4.2.3.3 *Status of the Morphology*

The morphology model adopted here is lexical-realisational, thus the feature bundles delivered by  $C_{HL}$  are post-syntactically correlated with phonological features (Halle and Marantz 1993, 1994; Harley and Noyer 1999 etc.).<sup>23</sup> Syntax thus manipulates abstract heads without phonological content, whereas Morphology interprets the output of Syntax. The correlation of phonological with syntactic features is called *vocabulary insertion*. It is defined in (83).

(83) *Vocabulary Insertion* (Trommer 1999, 2003):

If M is a vocabulary item with syntactic features  $\alpha$  and phonological features  $\beta$ , and S is a head with features  $\gamma$ , where  $\alpha$  is a subset of  $\gamma$ , then delete the features of  $\alpha$  in  $\gamma$  and add  $\beta$  to the phonological representation of S.

Consequently, when a M is underspecified,<sup>24</sup> it only deletes a part of  $\gamma$ . When there is a second marker N, which is specified for (a subset of) the features left in  $\gamma$ , then N is inserted, too. In other words, more than one feature can be inserted into a head (as opposed to Halle and Marantz 1993, where only one feature can be inserted per head).

#### 4.2.3.4 *Probe Impoverishment*

This section is a follow-up to section 2.2, where I discussed the modelling of movement to the edge. In this section, I am developing the mechanism of how movement to the edge triggers path effects. The key to the morphological and most of the syntactic reflexes of successive-cyclic movement is probe impoverishment. The concept of probe impoverishment is originally proposed in Béjar (2003), where it results in default agreement.

(84) *Probe Impoverishment* (Béjar 2003:76ff.):

In probe impoverishment, a feature of the probe is deleted without valuing. Probe impoverishment leads to default agreement. It is a legitimate last resort mechanism in syntactic computations needed to rescue or delete unvalued uninterpretable features.

In the analysis put forth by Béjar (2003), probe impoverishment takes place when value fails because the match between probe and goal is blocked by an intervener, or because a probe does not find a match in its search space. In this case, an active feature of the probe is deleted, but the probe remains active, and allows for another attempt to agree (=partial deletion). If it can be valued in the next attempt, then the feature is valued and deleted. If it cannot be valued after (possibly several stages of) partial deletion, then the last active feature is deleted (=total default

23. Arguments in favour of late insertion are given e.g. by Bobaljik (2002), Sauerland (1997).

24. See section 2.2.2.4, where the notion of underspecification is discussed in detail.

agreement), which allows the system to go on without leaving behind unsatisfied features.

I adopt the notion of probe impoverishment in a modified version. In section 2.2.1 I argued that one possible way of implementing movement to the edge is by violating the Inclusiveness Condition (=edge feature insertion). What I am going to do now is to hook up edge feature insertion with probe impoverishment.

The idea is that there is no edge feature  $[\bullet X \bullet]$  as such. Rather, edge features are features that possess the edge property “ $[\bullet \bullet]$ ”, that is, the ability of building structure by external or internal merge. When the system opts for an Inclusiveness Condition violation as a last resort to balance the phase, then it is not a complete edge feature that is inserted, but only the edge property. This property is no independent feature – just like a clitic, it needs a “host” that it docks on to. The edge property can be assigned to any feature of the current head, for example, to a categorial feature, number feature, or voice feature. The newly created unit then acts as an edge feature in that it triggers internal merge of an element that is later needed. It seems odd at first sight that a feature like  $[\bullet \text{cat:V} \bullet]$  can attract a wh-phrase. However, the feature the edge property is combined with does not take part in the matching operation. Rather, the edge property “ $[\bullet \bullet]$ ” is actually an abbreviation for  $[\bullet \bullet / \_\_ x]$ , where  $[x]$  is the feature that Phase Balance detects must be available at the edge, e.g.  $[+wh]$ .

(85) *Edge Feature, Edge Feature Insertion:*

There is no edge feature as such. The property of being an edge feature is the ability of building structure. Edge feature insertion is the combination of the edge property with a feature that is already present on the current head.

The edge feature attracts the element bearing the feature  $[x]$ . **When the edge property is dealt with, then the entire edge feature is deleted;** in other words, once satisfied, the edge property drags its host along to doom. Which feature is assigned edge feature status varies cross-linguistically, and from head to head. The result of probe impoverishment is that the feature that was deleted is not available anymore as a syntactic context when vocabulary insertion takes place. Thus, there are no postsyntactic impoverishment rules; **impoverishment happens in the syntax** as a last resort operation.

If edge property insertion happens or not (and thus if a probe is impoverished or not) has an effect on the inflectional markers that are post-syntactically inserted into the probe. The reason for this is that vocabulary insertion proceeds in accordance with the Subset Principle, which is repeated here from page 25.

(86) *Subset Principle (see Halle 1997):*

A vocabulary item  $V$  is inserted into a functional morpheme  $M$  iff. (i) and (ii) hold:

- (i) The morpho-syntactic features of  $V$  are a subset of the morpho-syntactic features of  $M$ .

- (ii) V is the most specific vocabulary item that satisfies (i).

The Subset Principle has the effect that it is always the most specific matching marker  $M_1$  that is inserted into the syntactic context in question; less specific matching markers are suppressed. If, however, morphosyntactic features are deleted before vocabulary insertion takes place, then  $M_1$  may not fit anymore into the relevant context. In this case a matching marker is inserted that is less specific than  $M_1$ . The chain of consequences from syntax to PF is thus as follows: If and only if movement to the edge takes place, then probe impoverishment takes place (but not obligatorily, and not necessarily on all heads and in all languages – see section 4.2.3.5), which may lead to the insertion of a less specific marker on the probe in comparison to non-extraction contexts. I formulate this generalisation in (87).

(87) *Generalisation:*

When a language shows different exponents in movement and non-movement contexts, then the marker appearing in the context of movement is less specific than the marker appearing in non-movement contexts (=retreat to the general case, emergence of the unmarked).

This reasoning also works in the other direction: If a less specific marker “than usual” appears in a syntactic context, then this is a sign that an element has been extracted in a last resort operation.

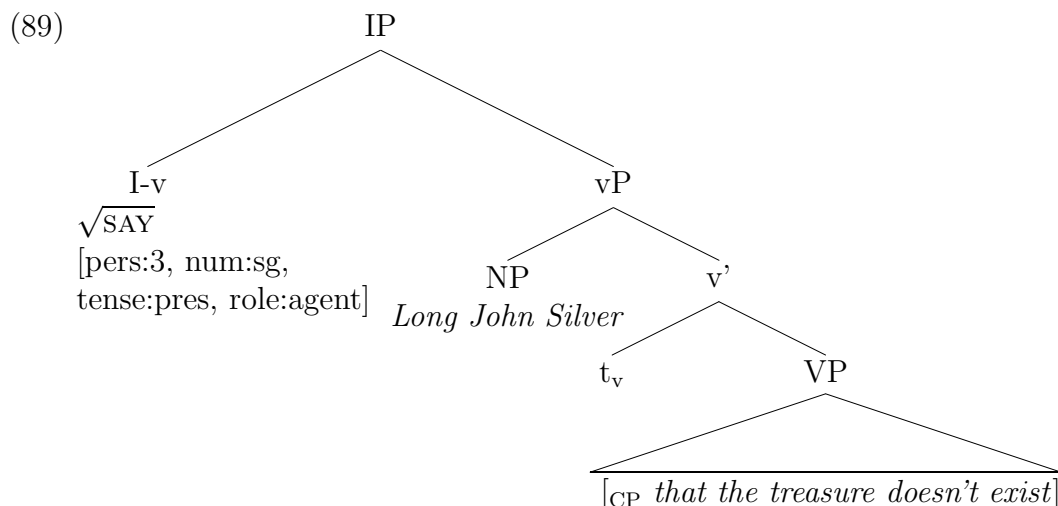
Let me illustrate this by means of an example. Let there be a language Martian English which is almost identical to Terrestrial English, but with the differences that there is always v-to-I movement (which makes the language verb-initial), and that v agrees with the external argument in both  $\phi$ -features (person, number) and theta-role. There are two exponents that play a role in this example, a highly specific person-number marker, and a less specific theta role marker. These are given in (88).

(88) *Some vocabulary items of Martian English*

$M_1$ : /-s/  $\rightarrow$  [pers:3, num:sg, tense:pres]

$M_2$ : /-p/  $\rightarrow$  [role:agent, num:sg]

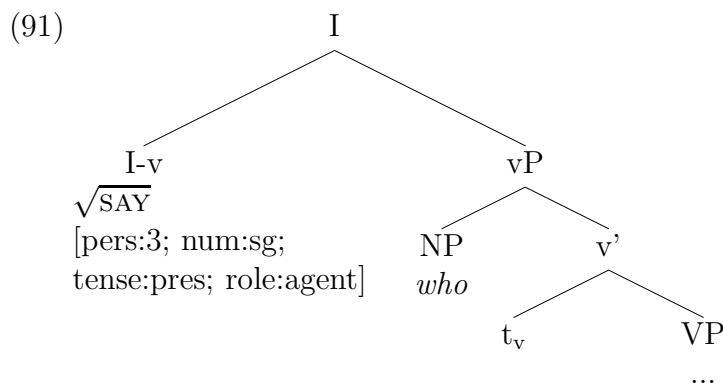
In declarative clauses, the external argument is not extracted from the vP. An exemplary derivation is given in (89).



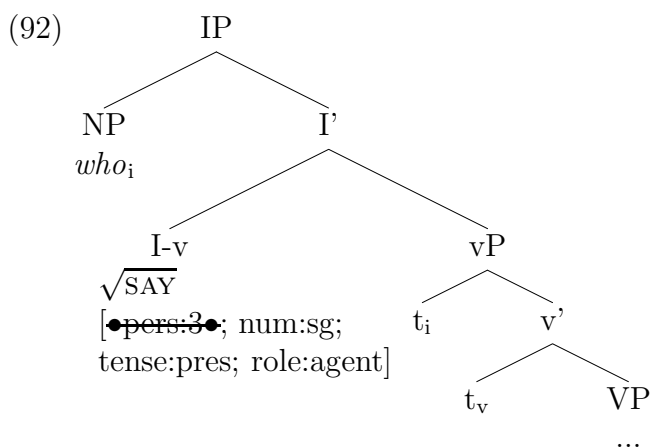
After the derivation is completed, all feature sets are replaced by vocabulary items. Both  $M_1$  and  $M_2$  match the feature set of  $v$ , but  $M_1$  is more specific than the theta role marker  $M_2$  in that it has more matching features than  $M_2$ . As a result, the person-number marker  $/-s/$  is inserted here.

- (90) Say-s                      Long John Silver that the treasure doesn't exist  
       say-3SG.PRES  
       'Long John Silver says that the treasure doesn't exist'                      (Martian English)

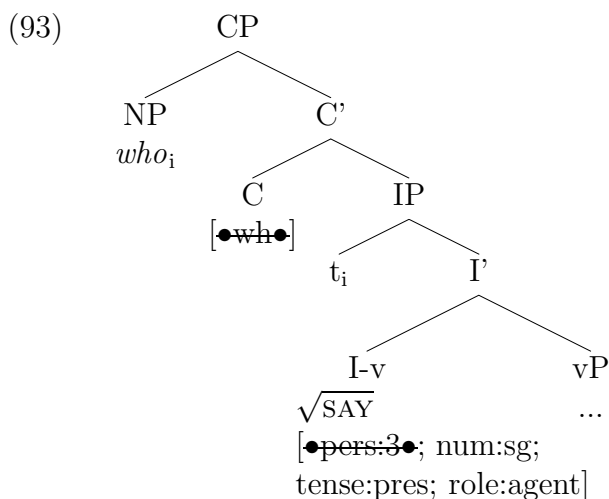
In a second possible derivation, there is a  $C_{[\bullet \text{wh} \bullet]}$  in the numeration. The relevant stage is given in (91).



The theoretical background established so far is also at work in Martian English: I is a phase, and phase balance is an underlying requirement. This means that the complement of I is transferred as soon as I is completed; if the *wh*-element is to be in C's search space, then it must be moved to the edge of I as a last resort. Movement to the edge is triggered by EPP feature insertion (i.e., the ranking is  $\text{ECOM} \gg \text{IC}$ ). According to the new theory, what is inserted is the ability of triggering movement (notated as  $[\bullet \bullet]$ ). Let us assume that the feature to which the edge property is assigned is the person feature; the feature set of  $v$  is thus  $[\bullet \text{pers}:3\bullet, \text{num:sg}, \text{tense:pres}, \text{role:agent}]$ . The feature  $[\bullet \text{pers}:3\bullet]$  now triggers movement of the *wh*-item to the edge of I. The result is shown in (92).



Now C is merged, and satisfies its structure-building wh-feature by internally merging *who* as its specifier. The final structure can be seen in (93).



At vocabulary insertion,  $M_1$  does not fit anymore into the syntactic context of I-v, as it is specified for a person value; the person feature in the syntactic context was, however, deleted in the syntax. Now  $M_2$  is the most specific matching marker. Consequently, /-p/ is inserted.

- (94) Who say-p                      that the treasure doesn't exist?  
    say-AGENT.SG

‘Who says that the treasure doesn’t exist?’ (Martian English)

What this example shows is that the verb registers two kinds of agreement (person-number and theta role), but only one of them can surface: When probe impoverishment does not take place, then the more specific person-number marker always wins and blocks the insertion of the less specific theta role marker. If, however, an element is moved to the edge of I as a last resort, then the person marker is used up as an edge feature. Vocabulary insertion now encounters an impoverished verbal feature set into which  $M_1$  does not fit anymore. Under these circumstances, the most specific matching marker is  $M_2$ , so that  $M_2$  is inserted.

The morphological reflexes of successive-cyclic movement can now be defined as variations in vocabulary insertion (=Subset Principle effects) caused by feature

deletion in the syntax (=probe impoverishment), which itself is the consequence of a last resort operation (=edge property insertion) that triggers movement to the edge. This approach is conforming to Zaenen’s Generalisation, according to which only heads (complementisers and verbs in the original formulation) along the path of the moved element are effected by movement reflexes; elements located at the edges that are crossed by the movement are not affected.

(95) *Zaenen’s Generalisation (Zaenen 1983):*

Only complementisers and verbs are ever affected by reflexes of successive-cyclic movement.

#### 4.2.3.5 *On Variation*

This section is a direct follow-up from section 2.2.3. The result of 2.2.3 was that movement to the edge can be yielded by repair-driven movement or by edge property insertion, depending on the ranking of ECOM and IC: If IC is higher ranked than ECOM, movement to the edge is not feature-driven; if the ranking is ECOM $\gg$ IC, then an edge feature is inserted. These two options leave behind different “relics” after movement to the edge has taken place: In the IC $\gg$ ECOM case, the feature set of the phase head stays unchanged. For the ECOM $\gg$ IC case, it was originally said in section 2.2.3 that movement to the edge leaves behind a satisfied edge feature on the phase head. Now, equipped with the new notion of probe impoverishment, we are in a state to say that the “relic” of edge property insertion is not a satisfied edge feature, but in fact an impoverished probe. A crucial point of cross-linguistic variation is thus the ranking of ECOM and IC: Morphological reflexes of successive-cyclic movement only occur in languages where the Economy Condition on Merge is higher ranked than the Inclusiveness Condition. I assume that this is the case in Chamorro. On the other hand, a language does not show morphological reflexes of successive-cyclic movement when the Inclusiveness Condition is higher ranked than the Economy Condition on Merge. This is the first point of variation that the new analysis allows for. The second point of variation is the particular feature that is assigned the edge property. Basically, any feature can become an edge feature.

There is a third source of variation, namely the timing of the operation Phase Balance. This point plays a role in the analyses of tonal downstep deletion and verb inversion, and is therefore discussed in sections 4.3.2.2 and 5.2.2.

As to the intra-linguistic variation, the optionalities in Chamorro “wh-agreement” are implemented by assuming that there is variation as to which head merges the verbal arguments, and with regard to the presence of argument-introducing features on *v*. This kind of variation is very close to the feature variation proposed in Aldridge’s (2008) analysis of extraction in Austronesian.

#### 4.2.4 **On the Nature of the “Regular” and “Special” Morphology**

Before we start with the analysis, we need to know the feature specifications of the morphological markers involved. To that end we first need to arrive at a suitable

decomposition for the person, number and mood features. Chamorro has four possible values for person, three values for number, and two values for mood. I propose the decompositions shown in tables 6, 7 and 8.

Table 6

*Chamorro*  
*Person feature decomposition*

PERSON	SPECIFICATION
1INCL	+1 -2 +incl
1EXCL	+1 -2 -incl
2	-1 +2
3	-1 -2

Table 7

*Chamorro*  
*Number feature decomposition*

NUMBER	SPECIFICATION
SG	+sg -pl
DU	-sg -pl
PL	-sg +pl

Table 8

*Chamorro*  
*Mood feature decomposition*

MOOD	SPECIFICATION
REALIS	-irr
IRREALIS	+irr

In addition, the morphology is sensitive to the transitivity of the predicate. In section 4.2.3.1, I formally implemented this by making use of non-deleteable features [arg] on V and v as counterparts to the argument-introducing [•N•]-features. If two or three [arg] features become part of the same feature bundle due to head movement, then they cluster together. These [arg]-features can be accessed by vocabulary items. This allows e.g. for markers that are specified for [arg-arg] – these only show up in transitive contexts.

The specifications proposed for person-number markers are given (96).

(96) *Chamorro subject agreement markers:*

- /ha-/ ↔ [-1 -2 +sg -irr] /\_\_\_ [cat:V]
- /hu-/ ↔ [+1 -2 +sg] /\_\_\_ [cat:V]
- /un-/ ↔ [-1 +2 +sg] /\_\_\_ [cat:V]
- /-ta/ ↔ [+1 +incl pl] /\_\_\_ [cat:V, -2, num]
- /in-/ ↔ [ $\alpha$ 1 - $\alpha$ 2 pl] /\_\_\_ [cat:V, num]
- /ø-/ ↔ [-1 -sg pl] /\_\_\_ [cat:V, -2]
- /u-/ ↔ [-2] /\_\_\_ [cat:V, +irr, num]

Remember from table 3 that the third person plural marker is *ma-*. This exponent is entirely syncretic with the passive marker, and the desideratum is of course to analyse the 3rd person plural marker as the passive marker. I derive the syncretism in the following way: There is a hierarchy-based constraint on subjects which has the effect that a transitive predicate can have a 3rd person plural pronominal subject, but not a third-person plural full NP subject (Chung 1998:32). I assume that



there is an additional ban for the predicate to overtly express the agree relation  $[-1 -2 -sg]$ . If the external argument is a third-person plural pronominal, then vocabulary insertion skips over the vocabulary item that is specified for 3rd person plural ( $=/\emptyset-/ \leftrightarrow [-1 -sg]/\_ [cat:V, -2]$ ). The system now inserts the second-best match in terms of specificity. I will come back to this issue immediately.

The “special” markers *-um-*, *-in-*, *man-* and *fan-* need some more considerations, as we first need to answer a question that is long overdue: What do these markers code? Given the Syncretism Principle, there must be an underlying common function that surfaces in extraction contexts as well as control and passive. Following Donohue and Maclachlan (2005) and Dukes (1992), I analyse the “special” markers as voice markers: *-um-* is an agent marker, *-in-* is a patient marker, *man-* is an agent plural marker, and *fan-* is an agent plural irrealis marker. There are two pieces of evidence that support this analysis. Firstly, these markers only appear when there is a special syntactic operation involving the agent or patient. For example, the marker *-um-* appears when the agent is involved in a syntactic operation, as e.g.  $wh_{subj}$ -extraction and subject control. The agent marker is at work in nominalisation, too. The infix *-um-* is used to derive an agent:

- (97) Hu li'e' i     h<**um
       I    saw DEF <UM>lifted me  
       ‘I saw the one who lifted me’**

The patient marker *-in-* appears only when the patient involved in a syntactic operation. This is the case in non-subject extraction and passive (where it is promoted to “subject”). In nominalisations, the patient voice marker *-in-* derives a patient or goal. Compare (74b) to (74b):

- (98) Hu li'e' i     h<**in
       I    saw DEF <IN>lifted  
       ‘I saw the thing that was lifted’**

The second piece of evidence is a comparative argument. The markers *-um-*, *-in-* and *man-* also appear in related Austronesian languages such as Kapampangan and Tagalog, and there is general consensus in that they are agent and patient voice marker, respectively (e.g. Dukes 1992, Arka and Ross 2005, Donohue and Maclachlan 2005, Rackowski and Richards 2005, among many others).

The voice feature has two values, AGENT and PATIENT. I am therefore working with the voice feature decomposition shown in table 9.

Table 9

*Chamorro**Voice feature decomposition*

VOICE	SPECIFICATION
AGENT	+ag
PATIENT	−ag

Vocabulary items:

(99) *Chamorro voice markers:*

$\emptyset \leftrightarrow [\text{VOICE}, \text{arg-arg}] / \_\_ [\text{num}, \text{voice:}+\text{ag}]$   
 $\text{/fan-}/ \leftrightarrow [\text{VOICE:}+\text{ag}, +\text{irr}] / \_\_ [+pl]$   
 $\text{/man-}/ \leftrightarrow [\text{VOICE}, -\text{sg} +\text{pl}] / \_\_ [\text{cat:V}]$   
 $\text{/ma-}/ \leftrightarrow [\text{VOICE}, -\text{sg}] / \_\_ [\text{cat:V}, \text{arg-arg}]$   
 $\emptyset \leftrightarrow [\text{VOICE:}-\text{ag}] / \_\_ [+ag]$   
 $\text{-um-}/ \leftrightarrow [\text{VOICE:}+\text{ag}]$   
 $\text{-in-}/ \leftrightarrow [\text{VOICE:}-\text{ag}]$

These are the pieces of inflection that are inserted in the contexts of *wh*-extraction, focusation, relativisation, and also control and passive.<sup>25</sup> The blocking of voice morphology in the presence of person and number markers in declarative clauses is a specificity effect: in transitive contexts, the most specific matching voice marker is a zero marker, and there is no non-zero voice marker that fits into non-plural intransitive irrealis contexts.

What still needs to be addressed is the question of which marker is inserted in 3rd person dual and plural contexts, and why. I already mentioned that in the case of a hierarchy-based restriction, the system “jumps over” the offending marker and inserts the second-best match in terms of specificity. A glance on the list of voice markers shows that the second-best match for third person non-singular contexts is */ma-/*. The marker */man-/* would match, too, in plural contexts, but the insertion of */man-/* is blocked here. The reason for this is that specificity-driven vocabulary insertion resolves competition between markers by “scanning” the candidates in a definite one-way order determined by the specificity of the candidates. Thus, when */ø-/* is skipped, then the system cannot go back to reconsider more specific markers again; it must scan for a less specific marker. */man-/* is more specific than */ø-/*, and thus not chosen when */ø-/* is skipped. But why is */man-/* then not preferred over the zero marker in the first place? The reason is that */man-/* is itself blocked in turn by an even more specific zero voice marker ( $\emptyset \leftrightarrow [\text{VOICE}, \text{arg-arg}] / \_\_ [\text{VOICE:}+\text{ag}, \text{num}]$ ). Note that */u-/* can still be inserted in 3rd person dual and plural contexts, as it expresses non-second person irrealis, and not the banned 3rd person plural. The subject constraint is only at work in transitive contexts. Thus, when the predicate is intransitive, then the zero marker does appear in 3rd person dual and plural contexts.<sup>26</sup>

#### 4.2.5 Verbal Inflection with Clause-bound Extraction

In this section I discuss in detail all cases of local extraction. I start with *wh<sub>nom</sub>*-extraction from transitive predicates (4.2.5.1), then turn to declarative intransitives, which display voice morphology in realis mood (4.2.5.2), and to argument

25. From now on, the voice specifications replace the old glossing ‘UM’, ‘IN’, ‘MAN’, ‘MA’ and ‘FAN-’ – these are now ‘AG’, ‘PAT’, ‘VOICE.PL’, ‘VOICE.NSG’ and ‘AG.PL.IRR’.

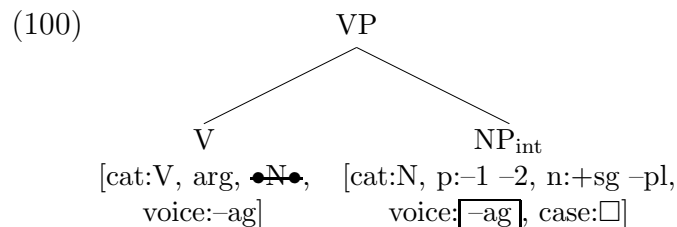
26. There are a number of other hierarchy constraints the description and analysis of which would go beyond the scope of this work (see e.g. Chung 1998:32f.). I am also aware of the fact that the dual marker *in-* is syncretic with the patient marker, but these are treated as a homonyms here, even though I suspect there might be a uniform way of analysing them.

extraction from intransitive predicates (4.2.5.3). Then there is an interludium on control (4.2.5.4). The following two sections implement the derivational nominalisation (4.2.5.5) and the occurrences of the patient voice morphology (4.2.5.6). (4.2.5.7) gives an account of the “passive” morphology. The last section discusses the status of topicalisation, where no special morphology shows up.

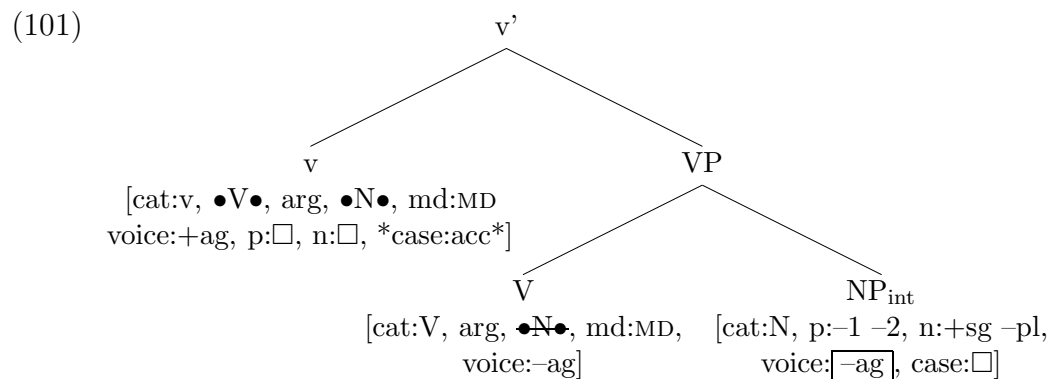
In each section, I give only the impoverishment rule (=edge property insertion rule) that is relevant to the case in question. The rules are summarised again in section 4.2.7.

#### 4.2.5.1 $NP_{ext}$ -Extraction from Transitive Predicates

The first step in the derivation is that V merges with  $NP_{int}$  (the  $\phi$ -values are examples). V values the voice feature of  $NP_{int}$ . This is shown in (100).



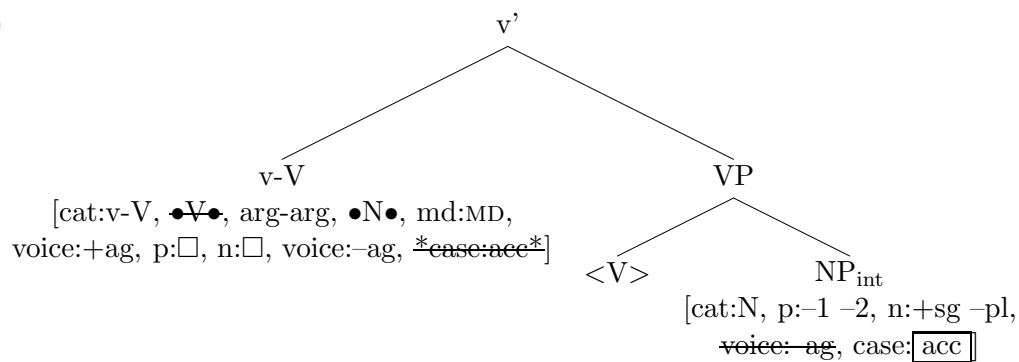
Next,  $v$  merges with VP.  $v$  bears unvalued  $\phi$ -features, a [voice:+ag]-feature, and a mood feature.<sup>27</sup>



In the next step, V moves to  $v$  to satisfy [ $\bullet V \bullet$ ], and  $v$  assigns accusative case to  $NP_{int}$ . The combination of [+ag] and [-ag] does not lead to a clash – they are two valued features of the same kind, but expressing agreement with different items, just as the two sets of  $\phi$ -features in languages with subject and object agreement.

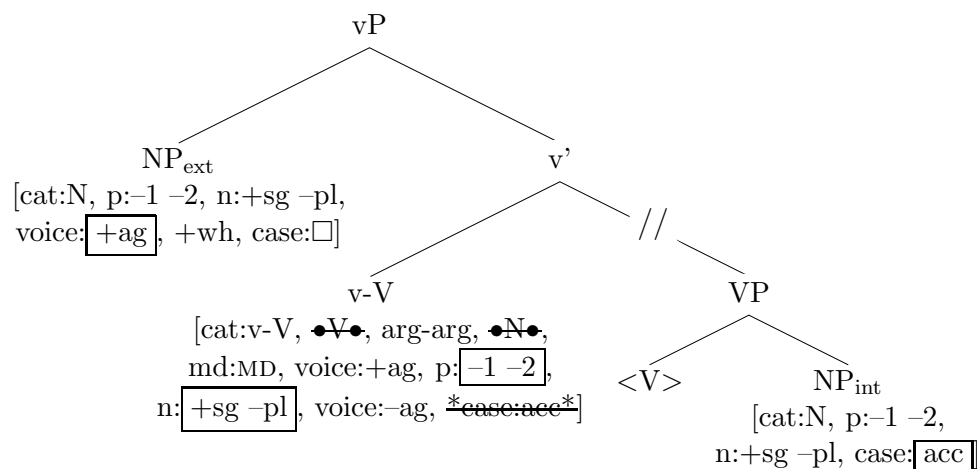
27. *Note:* The value MD is to indicate that the realis/irrealis distinction does not play a role yet. The mood value of I will be specified when this makes a difference.

(102)



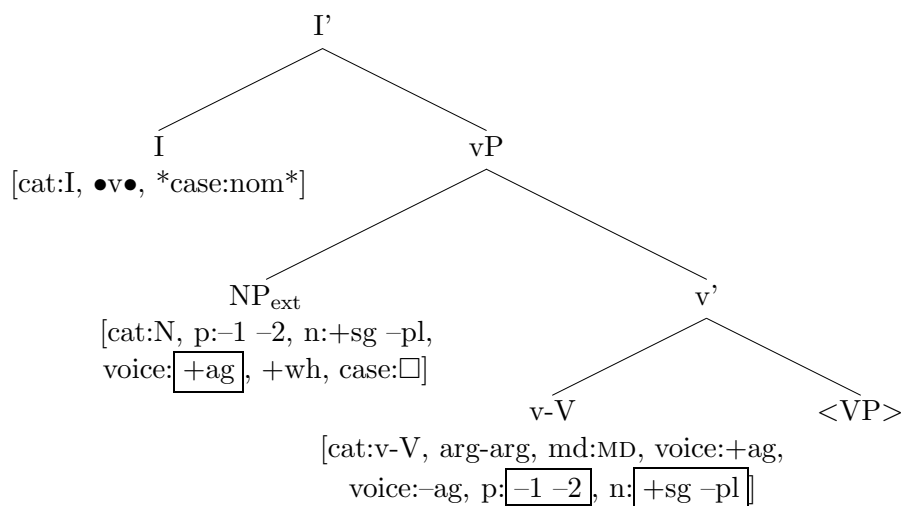
Subsequently,  $NP_{ext}$  is merged, and  $VP$  is Transferred.

(103)

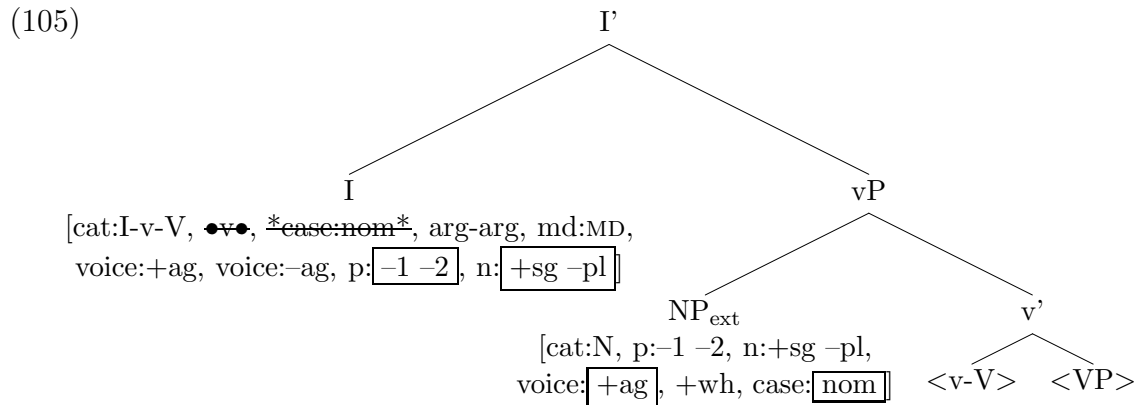


In the next step  $I$  is merged:

(104)



Now  $v$ -to- $I$  movement takes place, and  $I$  assigns nominative case to  $NP_{ext}$ . Note that  $I$  has no own EPP feature.

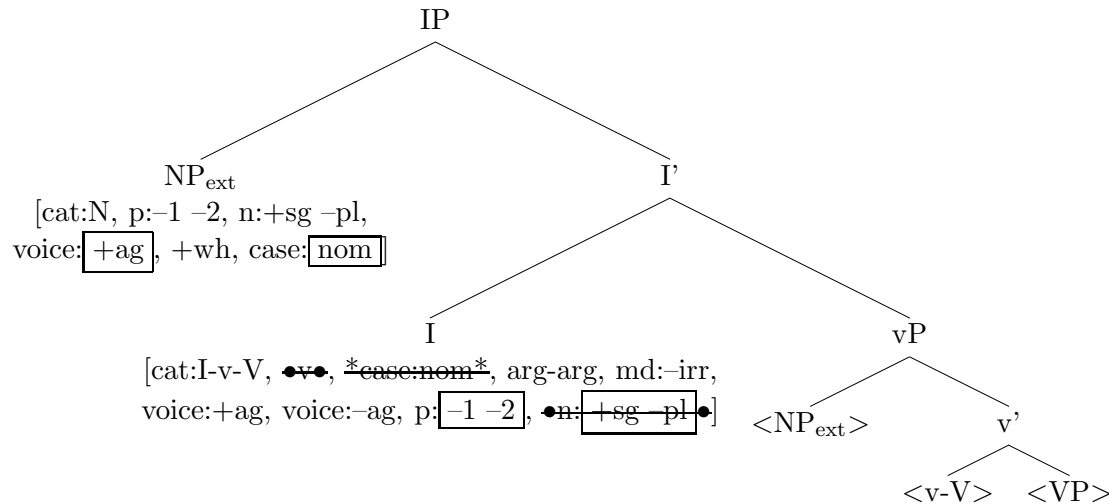


The next step is crucial: Phase Balance applies, with the result that a  $[\bullet +wh \bullet]$  feature is detected (feature of C), but there is no element containing a  $[+wh]$  feature potentially available. As a consequence, edge property insertion as defined in (85) takes place. This is formalised in (106).

- (106) *Edge property insertion rules for I:*  
 $[voice:-ag] > [\bullet voice:-ag \bullet] / \_\_ [cat:V +irr \text{ arg-arg}]$   
 $[num] > [\bullet num \bullet] / \_\_ [cat:V -irr \text{ arg-arg}]$

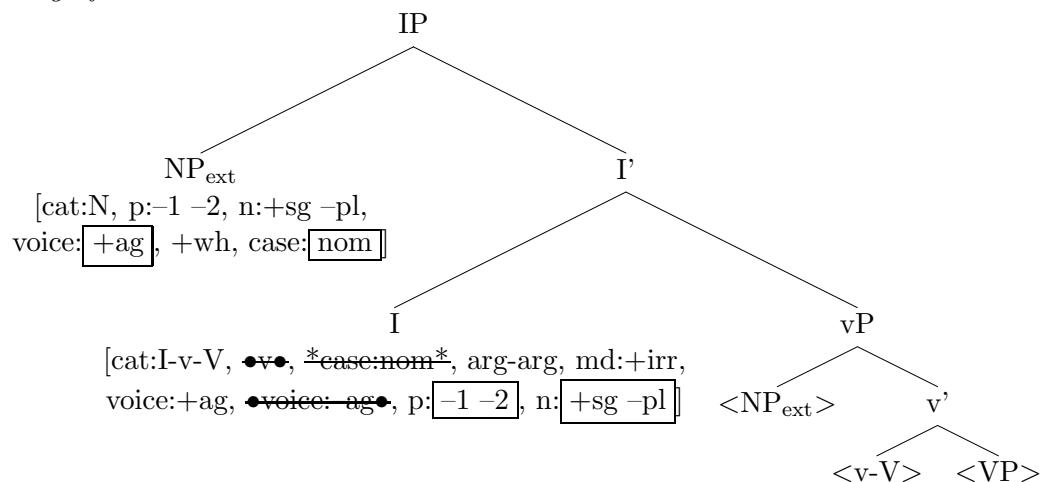
Edge property insertion is sensitive to mood and transitivity. In realis mood, the edge property is assigned to the number feature.  $NP_{ext}$  is moved to the edge of I, and the number feature is deleted:

- (107) *Edge feature insertion: transitive realis contexts*



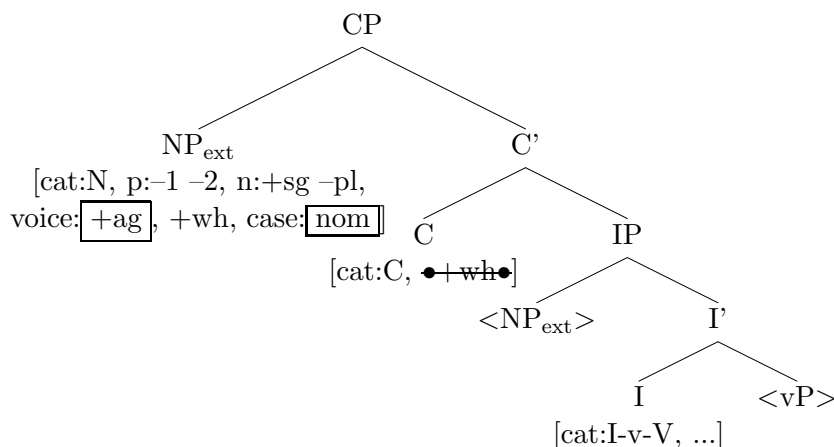
In irrealis mood, the edge property is assigned to the voice feature.  $NP_{ext}$  is moved to the edge of I, and the voice feature is deleted. This is shown in (108).

(108) *Edge feature insertion: transitive irrealis contexts*



Now C is merged, and the [+wh+] feature of C is satisfied by moving NP<sub>[+wh]</sub> to the edge of C (derivation for both cases, realis and irrealis):

(109)



The differences in the verbal feature set before and after extraction are summarised in table 10 ('edge mvt' is an abbreviation for edge feature-driven movement to the edge).

Table 10

*Chamorro*  
*Feature set*  
*of V<sub>tr</sub>*

	BEFORE EDGE MVT	AFTER EDGE MVT
REALIS	[cat:I-v-V, arg-arg, md:-irr, voice:+ag, voice:-ag, p: <span style="border: 1px solid black;">pers</span> , n: <span style="border: 1px solid black;">num</span> ]	[cat:I-v-V, md:-irr, arg-arg, voice:+ag, voice:-ag, p: <span style="border: 1px solid black;">pers</span> , <span style="background-color: black; color: black;">                    </span> ]
IRREALIS	[cat:I-v-V, md:+irr, arg-arg, voice:+ag, voice:-ag, p: <span style="border: 1px solid black;">pers</span> , n: <span style="border: 1px solid black;">num</span> ]	[cat:I-v-V, md:+irr, arg-arg, voice:+ag, <span style="background-color: black; color: black;">                    </span> p: <span style="border: 1px solid black;">pers</span> , n: <span style="border: 1px solid black;">num</span> ]

Let me give two vocabulary insertion examples to illustrate the consequence of edge property insertion.

(110) a. *3rd singular transitive realis*

Original feature specification of I: [-1-2, +sg-pl, +ag, arg-arg, -irr]

Edge feature insertion: [num] &gt; [●num●]

Features left after extraction: [+sg-pl, +ag, arg-arg, -irr]

Matching marker: /-um/ ↔ [+ag]

b. *1st plural inclusive transitive irrealis*

Original feature specification of I: [+1-2 +incl, -sg+pl, +ag, arg-arg, +irr]

Edge feature insertion: [voice:-ag] &gt; [●voice:-ag●]

Features left: [+1-2 +incl, n:-sg+pl, arg-arg, +irr]

Matching markers: /-ta/ ↔ [+1 +incl pl] /\_ [cat:V, -2, num], /u-/ ↔ [-2] /\_\_ [cat:V, +irr, num]

4.2.5.2 *Declarative Intransitive Predicates*

Intransitive predicates are marked by the voice markers *-um-* and *man-* in realis mood, even if wh-extraction does not take place:

## (111) a. H&lt;um&gt;anao gue'

&lt;AG&gt;go 3SG

'They went'

(Topping 1973:238)

## b. Man-hanao hit

VOICE.PL-go 1PL.INCL

'We went'

## c. Para u-saga

FUT 3SG.IRR-stay

'He will stay'

(Topping 1973:263)

## d. Para u-fañ-aga (=u-fan-saga)

FUT -2-AG.PL.IRR-stay

'They will stay'

This seems somewhat unexpected at first sight, as in this analysis, voice morphology shows up only if person or number features are deleted in the course of last-resort movement to the edge. However, if we consider again what was set as theoretical background, then probe impoverishment is actually correctly predicted to occur in intransitive derivations: Intransitive predicates contain only one argument-introducing [●N●]-feature. This feature is located in V, so that V always introduces the single argument. *v* has no own [●N●]-feature, which means that it can agree with the single argument, but not attract it to its edge by its own force. The argument NP however receives its nominative case from I, and must therefore be accessible for I. If *v* is a phase head, then NP<sub>arg</sub> is spelled out as soon as the vP is completed. The single argument must therefore be moved to the edge of *v* by a last resort operation. In this analysis of Chamorro, last-resort movement to the edge is always yielded by edge property insertion, which in turn leads to *v*'s feature set being impoverished.

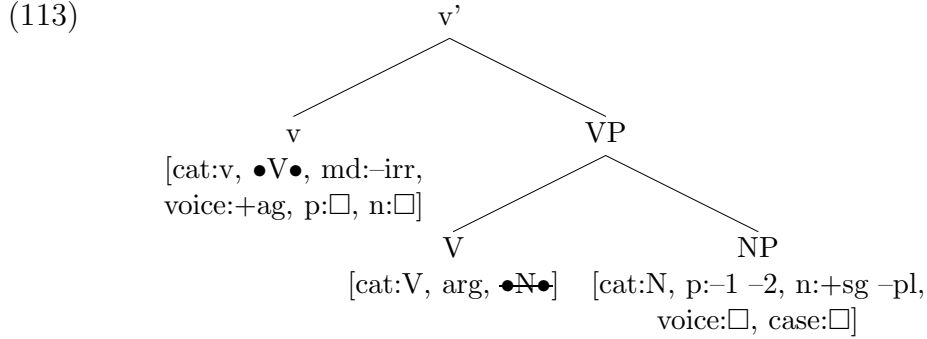
The next step is now to state which features are assigned the edge property. The rules are given in (112).

(112) *Edge property insertion rules for v:*

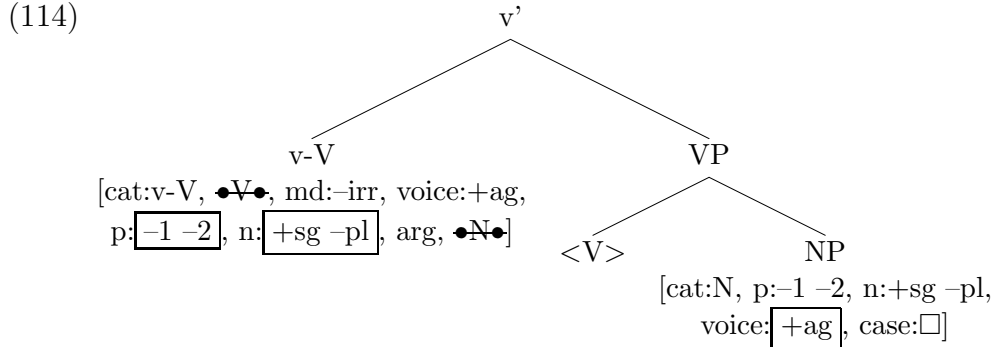
$$\begin{aligned} [\text{arg}] &> [\bullet \text{arg} \bullet] / \_\_ [+irr] \\ [\text{pers}] &> [\bullet \text{pers} \bullet] / \_\_ [-irr] \end{aligned}$$

The three decisive points of the derivation are exemplified in (113) to (115) by means of a realis unergative predicate. The property of being unergative becomes evident in V having no [voice:-ag] feature; as a result, the argument NP receives [voice:+ag] from v (in contrast, in unaccusative predicates, both V and v have a voice feature, and the argument receives [voice:-ag] from V).

(113) shows the “original state”: V has introduced the argument, but has no voice feature to assign to it. v is already in the structure.

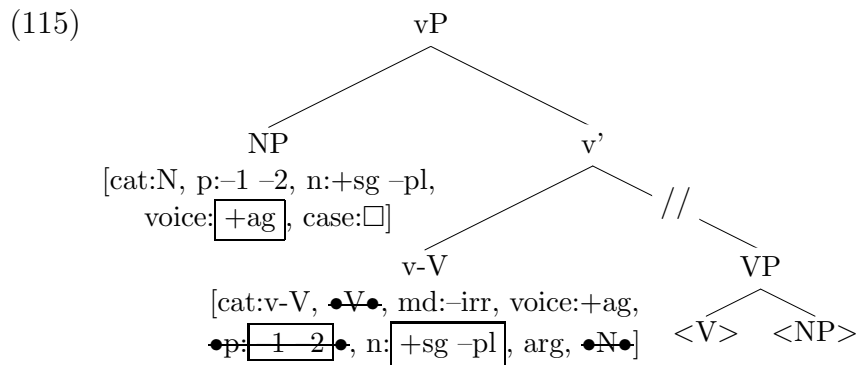


In (114), three things have happened: v has attracted V, valued the voice feature of the argument, and agreed with the argument in person and number.



Now the vP is actually complete, but the phase is not balanced, as there is an uninterpretable [\*case:nom\*]-feature in the numeration, but no element with an unvalued case feature potentially available. The argument must therefore be moved to the edge of v. This is yielded by assigning the edge property to a feature of v; according to the insertion rules in (112), the affected feature is the person feature. The newly built edge feature now attracts the argument NP, and is then deleted. Now the phase is balanced, and the VP is spelled out. The resulting structure is shown in (115).



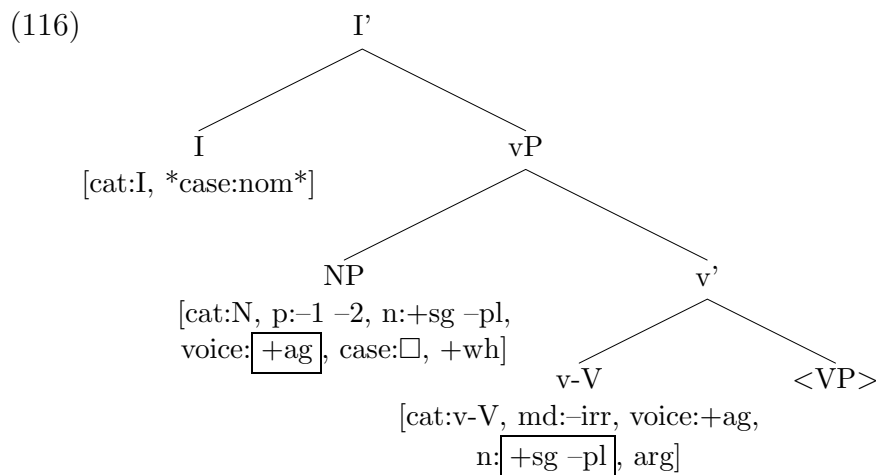


When this structure reaches the morphology component, then no marker from the set in table 3 matches into the syntactic context of  $v$ , as all of them are specified for person. The marker must thus be chosen from the set of voice markers (table 4). As the number is not deleted in intransitive derivations, the voice marker *man-* is inserted if number is specified as plural.

#### 4.2.5.3 Argument Extraction from Intransitive Predicates

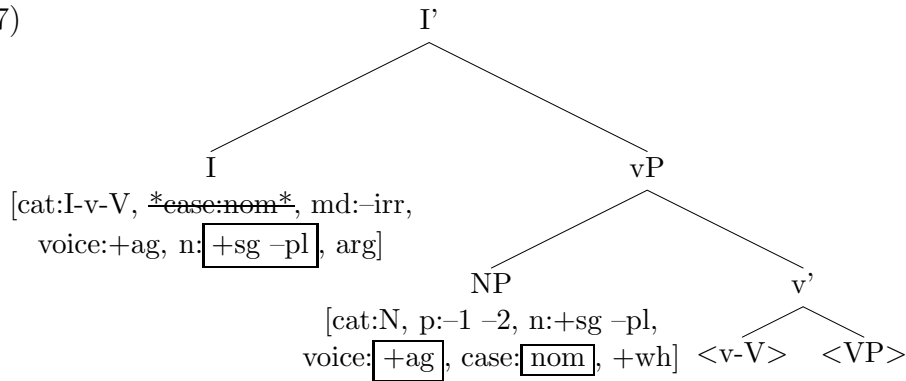
There are two observations that need to be taken into account. Firstly, intransitive predicates do not show a different marker when subject extraction takes place. This is accounted for by assuming that in intransitive contexts, the edge property is assigned to a feature of which the deletion has no impact on vocabulary insertion. Secondly, unaccusative and unergative predicates do not show differences with regard to subject extraction. They are thus not differentiated in this analysis (but see section 4.2.5.6, where the distinction is relevant).

The example derivation in this section is again an unergative predicate. The starting point is the stage shown in (115) above. In the next step,  $I$  is merged:



Now  $v$  moves to  $I$ , and  $I$  values the case feature of the argument:

(117)



If I is a phase head, then Phase Balance takes place now, reporting back that there is a [●wh●] feature in the numeration, for which a matching feature needs to be made potentially available. The argument NP must therefore be moved to the edge of v. This time, the edge property is assigned to the [arg]-feature.

(118) *Edge property insertion rule for I:*

[arg] > [●arg●] / \_\_ [arg]

(118) has the effect that whenever an item is last-resort-moved to the edge of I in intransitive clauses, then the [arg]-feature is deleted. This has no impact on the morphology, as the voice markers (which are the only matching markers, as the verb lacks the person feature) are not sensitive to transitivity. This yields the identical morphology in extraction and non-extraction contexts. Finally, note that (118) would also be fitting in transitive clauses, but the rules at work there (see 106) are more specific than (118) and thus preferred, and none of the rules in (106) are matching in intransitive contexts.

Two vocabulary insertion examples:

(119) a. *2nd plural intransitive realis*

Features of I-v-V: [cat:I-v-V, md:-irr, voice:+ag, n:[-sg +pl], arg]

Edge feature insertion: [arg] > [●arg●] / \_\_ [arg]

Features left after extraction: [cat:I-v-V, md:-irr, voice:+ag, n:[-sg +pl]]

Matching marker: /man-/ ↔ [VOICE, -sg +pl] / \_\_ [cat:V]

b. *3rd plural intransitive irrealis*

Features of I-v-V: [cat:I-v-V, md:+irr, voice:+ag, n:[-sg +pl], arg]

Edge feature insertion: [arg] > [●arg●] / \_\_ [arg]

Features left after extraction: [cat:I-v-V, md:+irr, voice:+ag, n:[-sg +pl]]

Matching markers: /u-/ ↔ [-2] / \_\_ [cat:V, +irr, num], /fan-/ ↔ [VOICE:+ag, +irr] / \_\_ [+pl]

#### 4.2.5.4 Verbal Inflection in Control Contexts

Chamorro has syntactic contexts in which the external argument of an embedded clause appears as the external argument of the matrix clause. This type of context has been analysed as control (Chung 1998). In control constructions, the embedded

predicate shows a reduced form of subject-verb agreement: It inflects for number in intransitive contexts only, and shows no person or mood inflection. The paradigm is given in table 11. Some examples from Topping (1973) and Chung (1998) are provided in (120).

Table 11

*Chamorro**Subject agreement on embedded V  
in control contexts*

NUM <sub>SUBJECT</sub>	TRANSITIVE	INTRANSITIVE
SG	<i>-um-</i>	<i>-um-/ -</i>
DU	<i>-um-</i>	<i>-um-/ -</i>
PL	<i>-um-</i>	<i>man-</i>

- (120) a. Hu chagi [h<**um
 1SG tried [<UM>lift DEF table ]  
 ‘I tried to lift the table’ (tr sg)**
- b. Tafañ-ä'-ayuda [k<**umum**-asisti i  
 1PLINCL-RECIPR-help [<UM>understand and UM-assist DEF  
 famagu'un siha ]  
 children 3PL ]  
 ‘Let us help one another to understand and assist the children’ (tr pl)
- c. Malago' yo' [l<**um
 want 1SG [<UM>dive LOC ocean ]  
 ‘I want to dive in the ocean’ (intr sg)**
- d. Man-malago' siha [**man**-ma'udai ]  
 PL-want 3PL [MAN-ride ]  
 ‘They want to ride’ (intr pl)

What is striking here is that the exponents *-um-* and *man-*, which are by now well known to us as the hallmarks of subject extraction, appear on the embedded verb. This observation is made in Chung (1983:234), and Dukes (1992) argues that the syncretism should be analysed as occurrences of one underlying marker. However, according to Chung (1998:243f.), the embedded verb is an infinitive, and *-um-* and *man-* are infinitive markers that are merely accidentally homonymous to the markers appearing along the path of extraction. The evidence put forth in Chung (1998) is that the embedded predicates of control constructions are invariably infinitives, whereas wh-extraction is not limited to non-finite clauses.

I would like to propose a new analysis of the markers occurring in Chamorro control structures. The main toehold is again the Syncretism Principle: Identity of form implies identity of function. The new proposal is therefore that the markers *-um-* and *man-* in control constructions are not infinitive markers that are homonyms of voice markers, but that they *are* in fact the voice markers listed in (99). This analysis has a number of new and highly intriguing repercussions:

The first consequence is that the paradigm of verbal inflection in control contexts turns out to be entirely identical to the inflection paradigm of wh<sub>NOM</sub>-extraction

contexts: If the embedded predicate is transitive, then the agreement marker is the marker expected with subject extraction from transitive realis predicates (invariably *-um-*). If, on the other hand, the embedded predicate is intransitive, then its agreement morphology must be identical to the pattern expected with subject extraction from intransitive predicates. As can be seen from table 4, no special morphology shows up in this context. The expected pattern is thus the regular inflection of intransitive verbs in contexts without *wh*-extraction. This is indeed borne out: as can be seen from the paradigm of intransitive verbs given in table 3, the inflectional pattern of intransitive embedded verbs in control constructions is identical to the pattern of realis intransitives. Control and subject extraction thus yield identical morphological marking on the agreeing verb.<sup>28</sup>

Remember from section 4.2.2 that the Syncretism Principle yields the null hypothesis that syncretic markers in a derivation A and a derivation B are evidence that A and B are derivationally related, so that the same marker fits in both contexts. The null hypothesis is thus that control and subject extraction are derivationally related. More precisely, they must be related in that both involve a last-resort movement step. As far as the intransitive control case is concerned, this is entirely expected: It was proposed in section 4.2.5.2 that the voice morphology in intransitive predicates is a reflex of the single argument being last-resort-extracted to the edge of *v*, so that the argument NP is accessible for case assignment by *I*. Now consider the transitive control case. Here the new insight leads to a rather surprising result: It was proposed in section 4.2.5.1 that the voice morphology in transitive predicates is due to an element  $\alpha$  being moved to the edge of *I* by edge property insertion into *I*. This, however, can only happen as a last resort to rescue an unbalanced phase, i.e., only if there is a higher probe for  $\alpha$ . Given that the embedded clause in control constructions is an IP, the higher probe for the controlled subject must be located in the matrix clause. This is a strong argument in favour of control as movement, as proposed by Hornstein (1999, 2001) (see also Manzini and Roussou 2000, Boeckx and Hornstein 2003, Barrie and Pittman 2004, Kim 2004, Witkoś 2007, Bowers 2008, among many others).

The second consequence is that the embedded predicate is not an infinitive, but a regular finite verb: It is impoverished by number features in transitive derivations, and by person features in intransitive derivation, which can only happen if it starts out with a complete set of  $\phi$ -features. This view is also supported by the observation that in intransitive contexts, the embedded verb shows the number-sensitive inflection characteristic of finite intransitive verbs in realis mood.

A straightforward conclusion from what was said so far is that control in Chamorro is finite control, and that finite control is derived by movement of the highest embedded argument to the matrix clause (contra Landau 2004). In what follows, I am presenting some more evidence in favour of this view. Landau (2004:816ff.) lists three characteristics of finite control:

28. Note again that the identical patterning has already been noted by Chung (1983, 1998), but the analyses put forth there do not allow for the conclusion that are drawn here, as they come at the price that the syncretisms have to be treated as accidental homonyms.

- (I) Irrealis interpretation of complement clause;
- (II) restriction to certain matrix predicates (those involving requests, orders, proposals etc.);
- (III) preference for third person controllers.

At first sight, characteristic (I) does not seem to be met in Chamorro: Embedded verbs in Chamorro control constructions behave like realis predicates with regard to extraction morphology. In addition, the embedded verb cannot register irrealis inflection or co-occur with irrealis-inducing elements (e.g. *pāra* ‘FUT’; Chung 1998:65). On the other hand, control clauses alternate freely with the corresponding finite irrealis clauses (Chung 1998:65):

- (121) a. Ha-chägi [b<um>äba i petta ]  
           3SG.try [<AG>open the door ]  
           ‘She tried to open the door’  
       b. Ha-chägi [pära u-bäba i petta ]  
           3SG-try [FUT 3SG.IRR-open the door ]  
           ‘She tried to open the door’ (Lit. ‘She tried that she should open the door’)

A straightforward conclusion is that although Chamorro control constructions are formally realis clauses, they are nevertheless interpreted as irrealis.

The second characteristic of finite control applies to Chamorro: The matrix clause is restricted to predicates like “want”, “try”, “let’s” and “is afraid”. In addition, “[i]mpressionistically, the range of higher verbs that select infinitive complements [i.e., finite control complements; A.L.] is narrower in Chamorro than in English” (Chung 2004:204).

As to characteristic (III), the diverse data provided in the literature suggest that Chamorro does not have a preference for third person controllers. However, note that the third person preference is a mere tendency, not an obligatory property of finite control. There are languages, like e.g. Romanian, that are generally assumed to have finite control, but that do not show a preference for third-person controllers. The following examples from Romanian are all equally natural:

- (122) a. Vreau să înțeleg  
           want.1SG PRT understand.1SG  
           ‘I want to understand’  
       b. Vrei să înțelegi  
           want.2SG PRT understand.2SG  
           ‘You want to understand’  
       c. Vrea să înțeleagă  
           want.3SG PRT understand.3SG  
           ‘(S)he wants to understand’

- d. Vrem      să    înţelegem  
 want.1PL PRT understand.1PL  
 ‘We want to understand’
- e. Vreţi      să    înţelegeţi  
 want.2PL PRT understand.2PL  
 ‘You want to understand’
- f. Vor        să    înţelegeă  
 want.3PL PRT understand.3PL  
 ‘They want to understand’

All this is reasonably good evidence in favour of the view that Chamorro indeed has finite control. In addition, the pattern of verbal syncretisms strongly suggests that in control structures, the embedded external argument is successive-cyclically moved to the edge of embedded I and subsequently extracted from the embedded clause.

#### 4.2.5.5 *Nominalisation*

Nominalisation occurs as a path phenomenon in two kinds of contexts: Firstly, predicates from which an internal argument is extracted are optionally nominalised (see table 4); there is no morphological difference between direct and indirect object extraction. Secondly, nominalisation always occurs when an oblique NP (=oblique complements of intransitive predicates, instruments, subcategorised comitatives) is extracted.

A crucial point that needs to be examined is the kind of nominalisation that occurs. Consider again the following example, which is repeated from page 50:

- (123) Hafa si    Maria s<in>angane-nña      as    Joaquin?  
 what UNM Maria <PAT>say.to-3SG.POSS OBL Joaquin  
 ‘What did Maria tell Joaquin?’  
 (Lit. ‘What is Maria her saying to Joaquin?’)

The nominalised predicate shows three characteristics: The direct object occurs with the oblique form of the case particle (Chung 1998:242), the external argument appears with an unmarked case particle if it is a full NP, and possessive inflection appears instead of the regular verbal subject marker. This behaviour entirely parallels “regular” nominalisation constructions, which are exemplified in (124).

- (124) a. rigalu-hu      nu    hagu  
 gift-1SG.POSS OBL 2SG  
 ‘my present to you’ (Chung 1998:52)
- b. ø-i            f-in-ahan-ña      si            Maria ni    chetda  
 UNM-DEF IN-buy-3SG.POSS UNM-DEF Maria OBL bananas  
 ‘Maria’s buying of the bananas, Maria’s banana-buying’ (Dukes 1992)

The examples show that the complements of nouns and nominalised verbs are marked as oblique. In addition, the external argument and the nominal show the hallmark of possessive constructions: Full external arguments (*Maria* in 124b) bear unmarked case, and the nominal appears with possessive inflection. Compare the following possessive constructions (Topping 1973:222):

- (125) a.  $\emptyset$ -i            malago'-ñiha     $\emptyset$ -i            taotao  
          UNM-DEF wish-3PL.POSS UNM-DEF people  
          'the people's wish'
- b.  $\emptyset$ -i            lahi-ña            si            (=si-i)            Pedro  
          UNM-DEF son-3SG.POSS UNM-DEF (=UNM-DEF) Pedro  
          'Pedro's son'

Here the possessed noun is affixed with possessive inflection, and the possessor appears with unmarked case (see table 5 on page 50; *i* is the definiteness marker). The morphological marking of movement-induced nominalisation thus entirely parallels that of "regular" nominalisation constructions. This in turn suggests that nominalisation along the path of successive-cyclic movement is structurally identical to "regular" nominalisation, and that it occurs very low in the structure; i.e., at VP stage, and not at vP stage – if it were vP nominalisation, then the direct object would not appear with the oblique marker, but with the unmarked (accusative) marker instead (cf. e.g. Chomsky 1970). An additional, albeit weaker, piece of evidence is that nominalisation is not sensitive to mood – it must therefore happen before *v* is in the structure (remember that *v* contains the mood feature).

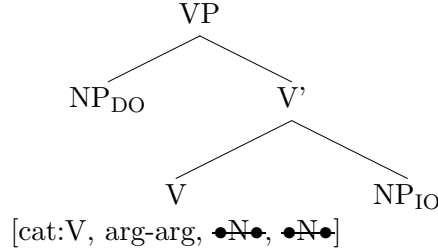
In the framework presented here, path phenomena are yielded by a phase head being manipulated in the course of movement to the edge. The desideratum is of course to analyse path nominalisation along the same lines. Consequently, the nominalisation must be yielded by *V*'s feature set being impoverished in such a way that it cannot be selected as a verbal predicate anymore, so that not *v*, but *n* is merged next. *n* has no [*\*acc\**]-feature, but assigns oblique case to NP<sub>int</sub>, and its  $\phi$ -features surface as possessor agreement. This of course means that there is Phase Balance-driven movement to the edge of *V*. In other words, the low nominalisation along the path of successive-cyclic movement is evidence for *V* being a phase head.

VP nominalisation also signals that the moved element is base-merged as or within *V*'s complement. This rationale is easily conceivable for those structures where *V* has a distinct edge domain (as in extraction of the lowest argument from a ditransitive predicate, and NP<sub>obl</sub>-extraction from a transitive or ditransitive predicate). There are other constellations where it is not immediately obvious that the extracted NP is moved to the edge of *V* (extraction of the second-lowest argument from a ditransitive predicate, NP<sub>int</sub>-extraction from a transitive predicate, NP<sub>obl</sub>-extraction from an intransitive predicate). I will, however, argue that this is indeed the case.

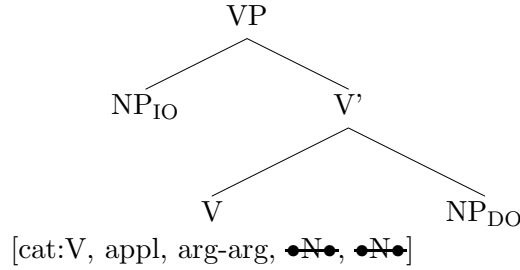
I start with the most evident case: extraction of an internal argument from a ditransitive predicate. Remember that in this case, just like with transitives, the

nominalisation is optional, no matter which argument is extracted. Following what Rackowski and Richards (2005) have proposed for Tagalog, I assume that the optionality is a reflex of two different argument structures being involved, benefactive and high applicative:<sup>29</sup>

(126) *Benefactive structure:*



(127) *High applicative structure:*



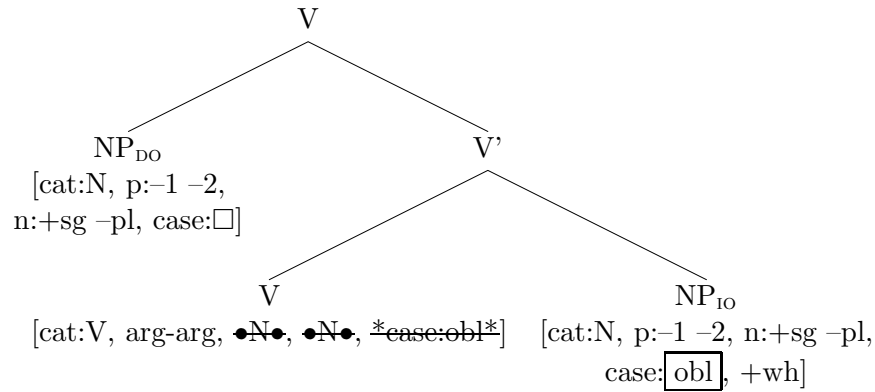
When the structurally higher NP is extracted out of the VP, then nominalisation does not take place, as the higher element is already located at the edge of V. If, however, the lower element is to be extracted, then it must be last-resort-moved to the edge of V. This is yielded by edge property insertion. The feature the edge property is assigned to is the categorial feature. The formalisation is given in (128).

(128) *Edge property insertion rule for V:*

$$[\text{cat:V}] > [\bullet \text{cat:V} \bullet]$$

Let me exemplify the analysis with NP<sub>IO</sub>-extraction from a benefactive structure. The basic argument structure is given in (129).

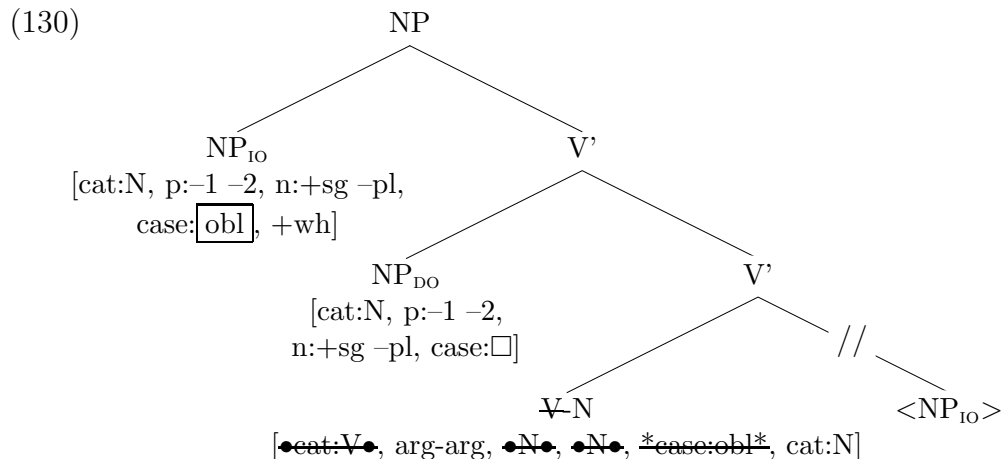
(129)



29. In the following, I will use the terms “direct object” (DO) and “indirect object” (IO) to refer to the patient and benefactive arguments, respectively; this only for the sake of clearness, and not as reference to their structural position or case marking.

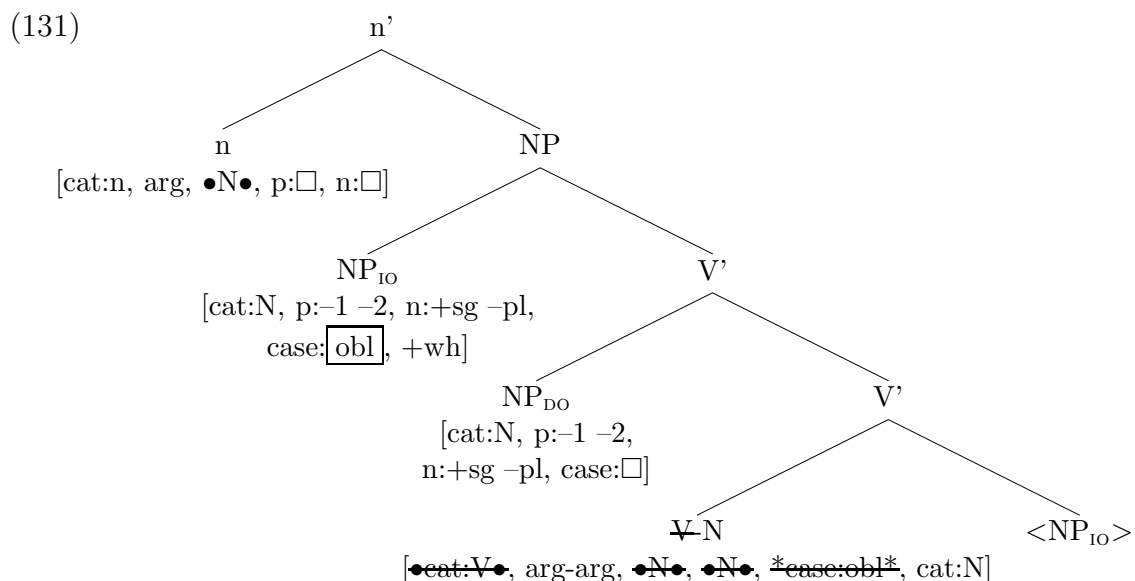


(130) shows what happens next: V's categorial feature is deleted in the course of movement to the edge. Thus, when the resulting node is to be labeled, the category that was V cannot give its label to the resulting node anymore. To resolve this situation, N's categorial feature is copied to the feature set that was V, and the head ' $\bar{V}$ -N' now gives the label N to the highest node. Then the complement of  $\bar{V}$ -N is Transferred.



One question that might come up here is if this is really evidence that V is a phase head; after all, it is a head with the label 'N' that triggers Transfer of its complement. The answer is that the argument still holds, because the movement to the edge is originally triggered by V. Besides, if N is still able to Transfer its complement, then this is evidence that N is a phase head, too.

The resulting NP cannot be selected by *v* anymore. What it can be selected by instead, however, is the head *n*, as *n* selects for nominal categories. Thus, *n* is merged next. This stage is shown in (131).



There is one crucial question that needs to be addressed: What happens when NP<sub>DO</sub> is merged as the lowest argument in a declarative context? This would

predict that nominalisation occurs in transitive declarative contexts, too, as NP<sub>DO</sub> must be moved to the edge of V to get case from v, but there is no empirical evidence that this ever happens. Interestingly, however, the data show that in this case, it is NP<sub>DO</sub> that receives oblique case:

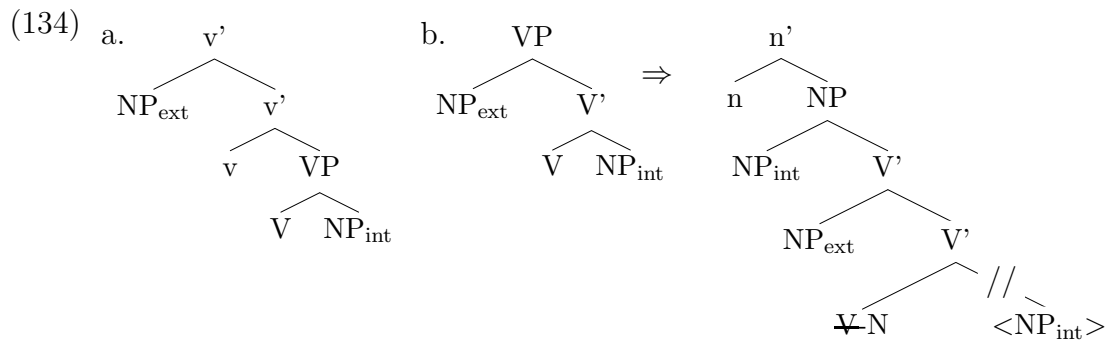
- (132) Ha-na'i si            nana-ña            ni   buteya-n    ketchap  
        3SG-give DEF.UNM mother-3SG.POSS OBL bottle-LINK soy.sauce  
        'He gave his mother the bottle of soy sauce' (Chung 1998:52)

This suggests that when the verb has oblique case to assign, it will assign it to the first argument it encounters. Thus, in high applicative structures, V assigns its oblique case to NP<sub>DO</sub>, and NP<sub>IO</sub> then receives accusative case from v (which surfaces as the unmarked case particle).

Let us now consider the next case: NP<sub>int</sub>-extraction from simple transitive clauses. A possible prediction here is that object extraction never involves nominalisation, as NP<sub>int</sub> is already located at the edge of V. This, however, is not borne out: there is nominalisation, but it is optional. This is illustrated again in (133), which is repeated from page 50.

- (133) a. Hafa si    Maria ha-sangani si    Joaquin?  
        what UNM Maria 3SG-say.to UNM Joaquin  
        'What did Maria tell Joaquin?' (tr, WH<sub>obj</sub>)  
        b. Hafa si    Maria s<in>angane-nña    as    Joaquin?  
        what UNM Maria <IN>say.to-3SG.POSS OBL Joaquin  
        'What did Maria tell Joaquin?'  
        (Lit. 'What is Maria her saying to Joaquin?') (tr, WH<sub>obj</sub>)

I propose the following solution: One of the background premises was that the UTAH is not strictly at work in Chamorro. Thus, although NP<sub>ext</sub> is always base-merged structurally higher than the internal arguments, there is variation as to which head base-merges the arguments. The "external" argument can therefore be base-merged at the edge of v or at the edge of V (in which case it is actually an internal argument; I will however retain the term 'external' argument). Nevertheless, transitive v always has an [**•N•**]-feature. Thus, when NP<sub>ext</sub> is base-merged by V, it is moved to the edge of v without v being impoverished. This optionality in argument structure accounts for the optionality of nominalisation: When NP<sub>ext</sub> is base-merged by v, as shown in (134a), then NP<sub>int</sub> is already located at V's edge, so that nominalisation does not take place. When, on the other hand, NP<sub>ext</sub> is base-merged by V, as in (134b), then NP<sub>int</sub> must be last-resort-moved to V's edge, which yields nominalisation.

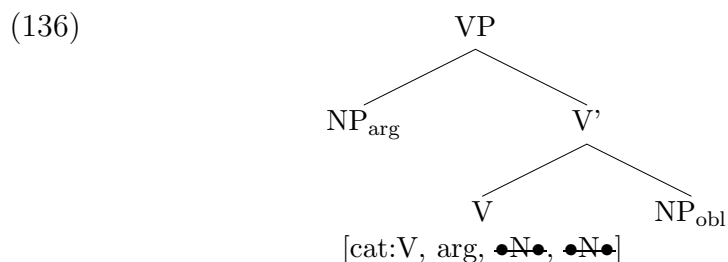


This is the basic mechanism that derives the nominalisation occurring with argument extraction.

What remains to be analysed is the nominalisation occurring with NP<sub>obl</sub>-extraction. The data showed that extraction of oblique NPs unvaryingly yields nominalisation which behaves equally to that occurring with NP<sub>int</sub>-extraction: There is possessive marking on the verb, the external argument appears with the unmarked case particle, and when an oblique NP is extracted from a transitive predicate, then the direct object is marked “oblique”. This is illustrated again in (135), which is repeated from page 49.

- (135) Hafa pära fa'gase-mmu ni kareta?  
 what FUT wash-2SG.POSS OBL car  
 ‘What are you going to wash the car with?’

The data show that NP<sub>obl</sub>-extraction yields VP nominalisation, too. But if V is sensitive to NP<sub>obl</sub>-extraction, then the only possible conclusion (independent of the individual theory) is that these elements are located somewhere in the domain of V. I assume that they are base-merged before the arguments, so that they must always be extracted to the edge of V before they can be extracted out of V. The structure of the VP containing an oblique NP is shown in (136).

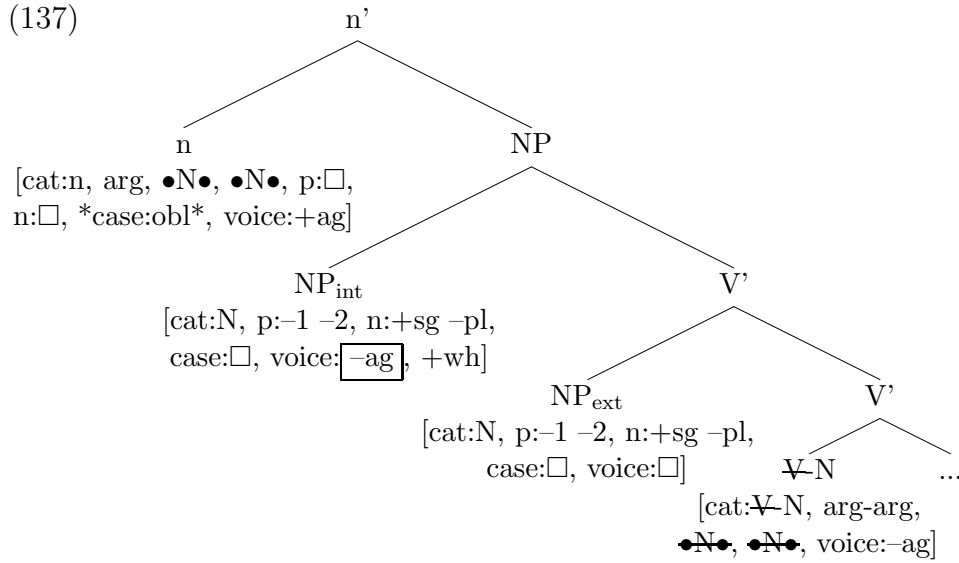


Further evidence for this structure is the observation that nominalisation in the context of NP<sub>obl</sub>-extraction is not sensitive to transitivity. This is fully expected if we take into account that the single argument of an intransitive verb is base-merged by V, not by v. Thus, there is always an argument present at the edge of V, so that an oblique wh-phrase must at any case be last-resort-moved to the edge of V.

## 4.2.5.6 Patient Voice Morphology

There are two environments in which the patient voice marker *-in-* occurs in the context of extraction: Firstly, when an internal argument is extracted from a transitive or ditransitive predicate and nominalisation takes place – then it occurs obligatorily; secondly, when an oblique element is extracted from an intransitive unaccusative predicate – then it is optional. This section analyses the emergence of patient voice morphology, but also answers the question why the exponent *-in-* does not show up in other contexts.

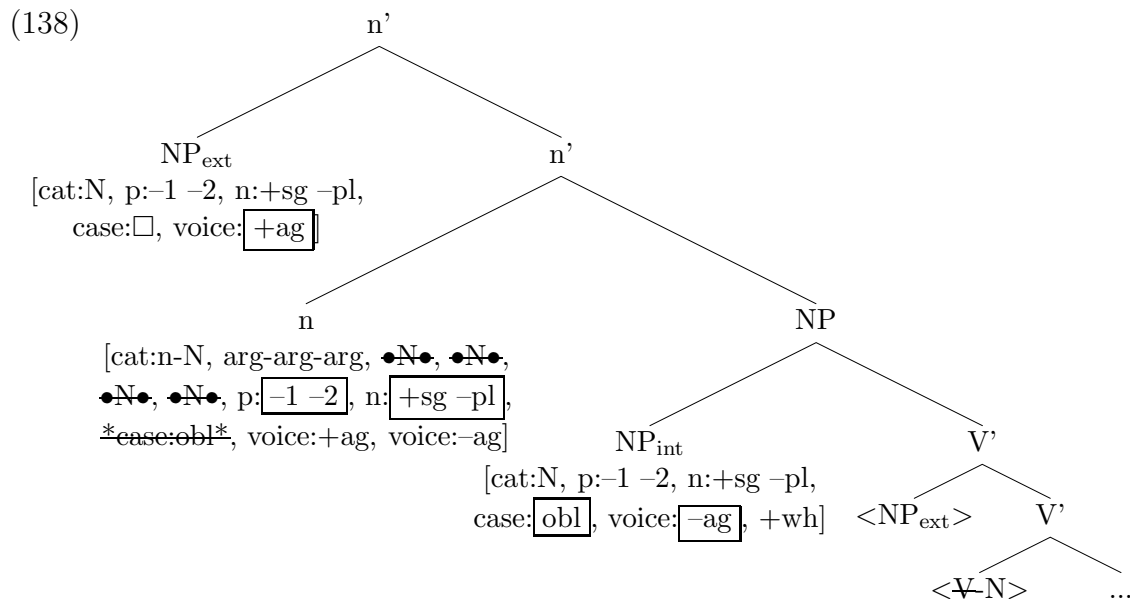
Let us first consider NP<sub>int</sub>-extraction. When nominalisation takes place (example 133b), then the derivation at the stage when *v* is merged looks like (134b), which I repeat here with some more “flesh”.<sup>30</sup>



Four things happen next:  $\nabla$ -N moves to *n*, *n* assigns oblique case to NP<sub>int</sub>, values the voice feature of NP<sub>ext</sub>, values its own  $\phi$ -features with the features of NP<sub>ext</sub>, and internally merges NP<sub>ext</sub> at its edge.<sup>31</sup>

30. In the following, I only consider NP<sub>int</sub>-extraction from transitive predicates; the argument directly carries over to ditransitive predicates, the only differences being that there is an additional internal argument at the edge of *V*, and that *v* base-merges the external argument.

31. Note that *n* has two [ $\bullet$ N $\bullet$ ]-features, one of which attracts the selected *N* head, the other attracts the external NP. I am aware that the feature triggering head movement must be in some way distinct from the structure-building feature, I will, however, not formalise this difference here, but see section 4.2.5.6, page 86.



Now Phase Balance takes place, with the result that  $NP_{int}$  must be moved to the edge of  $v$ . To this end, the edge property is assigned to the feature  $[voice:+ag]$ .

(139) *Edge property insertion rules for n:*

$[voice:+ag] > [\bullet voice:+ag\bullet] / \_\_ [cat:N \ arg-arg-arg]$

(139) has the effect that whenever N-to-n movement takes place and an element is extracted out of the NP, then the feature set of  $v$  is impoverished by the  $[voice:+ag]$  feature. The feature set of  $n$  is then  $[cat:n-N, arg-arg-arg, p:PERS, n:NUM, voice:-ag]$ . There is a zero vocabulary item that is inserted for  $[voice:-ag]$  in the context of  $[+ag]$ ; if  $+ag$  is deleted, then the less specific marker *-in-* is inserted.

Further extraction of  $NP_{int}$  to the edge of  $I$  does not have an impact on morphological marking, as the edge property insertion rules in (106), which delete  $[voice:-ag]$  and  $[num]$  of  $I$ , are specified for  $[cat:V]$ . The only rule that matches now is (118), which causes one of the  $[arg]$ -feature to be deleted, which has no impact vocabulary insertion.

There is an important point that needs to be addressed before we go on: In structures like (133a), where nominalisation does not take place, the internal argument is extracted to the edge of  $v$ , but the full set of  $\phi$ -features remains. I take this as evidence that in this case, the edge property is assigned to an  $[arg]$ -feature:

(140) *Edge property insertion rules for v:*

$[arg] > [\bullet arg\bullet] / \_\_ [arg-arg -pass]$

(140) is more specific than (112), and is thus preferred in transitive contexts. Thus, no  $\phi$ -feature is deleted on  $v$ , and the rules for  $I$  in (106) do not match anymore, as they are specified for  $[arg-arg]$ .

At first sight, the analysis makes a wrong prediction for  $NP_{obl}$ -extraction from ditransitive predicates: The oblique NP is moved to the edge of  $V$ , which results

in nominalisation. When  $\text{NP}_{\text{obl}}$  is subsequently moved to the edge of  $v$ , then (139) applies, as the contextual feature  $[\text{arg-arg-arg}]$  is indeed present in ditransitive predicates. This predicts patient voice marking on the predicate, which is not borne out. There is however a straightforward explanation for the absence of voice morphology: Remember that movement-induced nominalisation is due to the categorial feature of  $V$  being deleted when an item is extracted to  $V$ 's edge;  $V$ 's new categorial feature is copied from the extracted element. Now consider that oblique NPs (=oblique complements of intransitive predicates, instruments, subcategorised comitatives) are actually not NPs, but PPs (cf. Chung 1998:162, 394 n. 11). Thus, the feature that is copied to the feature set of  $\forall$  is not  $N$ , but  $P$ , and the resulting category is a PP. This PP can nevertheless be selected by  $n$  under the assumption that  $n$  does not select for  $[+N]$ , but for  $[-V]$ , and that the categorial feature  $[\text{cat:P}]$  is actually an abbreviation for  $[\text{cat: } -N -V]$ . The next step is P-to- $n$  movement, which is also triggered by a  $[\bullet-V\bullet]$ -feature, and which results in a category  $[\text{cat:n}[-N -V]]$ . If all this happens, then (139) cannot apply here, as it is specified for  $[\text{cat:N}]$ , that is, a  $[+N]$  category. This in turn has the consequence that the zero vocabulary item specified for  $[\text{voice:-ag}] / \_\_ [+ag]$  is inserted here; the less specific marker *-in-* is thus blocked.

That is, however, not the whole story – patient voice morphology also optionally appears with  $\text{NP}_{\text{obl}}$ -extraction from intransitive unaccusative predicates, but never with unergative predicates. This distinction can be derived rather easily: A background assumption was that in unergative predicates,  $V$  has no  $[\text{voice:-ag}]$  feature. The marker *-in-* can therefore not appear in the first place. In unaccusative predicates, on the other hand,  $V$  has a  $[-ag]$ -feature, and  $v$  has a  $[+ag]$ -feature. There is one more difference between the two kinds of predicates: The head  $n$  is sensitive to the unaccusative/unergative distinction in that unergative  $n$  always has an  $[\text{arg } \bullet N \bullet]$ -feature, whereas unaccusative  $n$  *can* have an  $[\text{arg } \bullet N \bullet]$ -feature. There are two further rules for  $n$ :

(141) *Edge property insertion rules for n:*

- $$\begin{aligned} [\text{arg}] &> [\bullet \text{arg} \bullet] / \_\_ [\text{arg-arg}] \\ [\text{voice:+ag}] &> [\bullet \text{voice:+ag} \bullet] / \_\_ [\text{arg}] \end{aligned}$$

Unergative  $n$  always has an  $[\text{arg } \bullet N \bullet]$ -feature, so that the resulting structure is equal to a transitive structure, the only difference being that  $V$  and  $n$  merge the same element (in other words, there is a kind of raising going on). Thus, when the oblique element is extracted to the edge of  $n$ , then the first rule of (141) applies, as it is the most specific matching rule. As a result,  $n$  loses an  $[\text{arg}]$ -feature, but not the actice voice feature. Unaccusative  $n$  *can* have an  $[\text{arg } \bullet N \bullet]$ -feature. If it does, then the structure involves two  $[\text{arg}]$ -features, and the first rule in (141) applies if an item is moved to the edge of  $n$ . Now the same rationale applies as above: The marker *-in-* cannot be inserted into this feature set, as there is a more specific matching marker ( $/\emptyset/ \leftrightarrow [\text{voice:-ag}] / \_\_ [+ag]$ ). If, on the other hand, unaccusative  $n$  is merged without an  $[\text{arg } \bullet N \bullet]$ -feature, then only the second rule can apply, so that the structure is left with the  $[\text{voice:-ag}]$ -feature. Now the marker *-in-* is the only matching voice marker.

The rules in (141) have no impact on the morphological marking of transitives and ditransitives, as *n* has [arg-arg]-features in these environments, so that the first rule invariably applies.

#### 4.2.5.7 Verbal Inflection in Passive Contexts

In passive contexts, the verb shows a marker that is sensitive to the number of the (internalised) external NP, even if the external argument is not overtly expressed (Chung 1998:37f., 240). The paradigm of passive morphology is given in table 12.

Table 12

*Chamorro*  
*Verbal inflection in*  
*passive contexts*

NUMBER OF INTERNALISED ARG	MARKER
SG	- <i>in</i> -
DU	- <i>in</i> -
PL	<i>ma</i> -

The following examples illustrate the pattern of passive marking. Especially (142) is remarkable: even though the internalised external argument is seemingly not present, the passive verb agrees with it; the utterance can only be interpreted in such a way that it is a single person that invites *the three of you*.

- (142) a. Kao pära infan-k<**in**>enni'      na    tres    pära i  
           Q    FUT 2PL.ITR.IRR-<IN>take LINK three to    the  
           sho? (Chung 98:37)  
           show  
           ‘Are the three of you going to be taken to the movies (i.e. by him/her)?’
- b. **Ni**-li’i’ as    Juan nigap  
           IN-see OBL Juan yesterday  
           ‘S/he was seen by Juan yesterday’ (Topping 1973)
- c. **Ma**-li’i’ ni    famagu’un nigap  
           MA-see OBL children    yesterday  
           ‘S/he was seen by the children yesterday’ (Topping 1973)
- d. Man-b<**in**>isita    hämyu?  
           VOICE.PL-<IN>visit 2PL  
           ‘Were you (plural) visited (i.e., by him)?’ (Chung 2004:218)

The examples show three characteristics of the construction that are crucial to the analysis. I will each of them address in turn.

Firstly, there are numerous syncretisms:

- (I) The passive plural marker *ma*- seems to be related to the plural marker of intransitive realis inflection *man*-;
- (II) there is formal syncretism of the passive singular marker and the marker appearing in *wh*<sub>OBJ/OBL</sub>-extraction (infix *-in*-).

Chung (1998:239ff.) argues that the markers *-in-* and *ma-* are passive markers that are accidentally homonymous and similar, respectively, to “wh-agreement” markers. Reason: passive has object agreement in number, whereas no number agreement occurs with wh-extraction of objects (the marker is invariably *-in-*).

The new approach allows for a reinterpretation of the data. The Syncretism Principle yields the null hypothesis that passivisation and wh-extraction are derivationally related in that the same edge property insertion rule applies in both of them. This means that the syntactic properties of passive and wh-extraction clauses do not need to be identical for the voice marking to emerge in both cases; it suffices that they *share* derivational steps. The null hypothesis for passive in Chamorro is therefore that the marker *-in-* is not a passive marker, but the patient voice marker, and *ma-* is a non-singular agent marker.

The second important point is that the agent appears with the oblique marker *as* when it is phonologically realised.

The third observation is that the verb agrees with both arguments: It behaves like an intransitive verb in that it registers the internal argument with a regular marker from the intransitive paradigm (Chung 2004:218), the only difference being that the marker *-um-* does not show up when the internal argument is singular. In addition, the passive verb registers the internalised external argument with the markers *-in-* and *ma-*, even when the external argument is seemingly omitted. To make this point clear, I repeat the predicates from (142) with new glossing and an additional glossing line indicating the argument the respective marker shows the agreement with:<sup>32</sup>

- (143) a. *infan-*                      *k<in>enni'*  
           2PL.ITR.IRR- <PAT>take  
           INT                      EXT
- b. *∅-*    *ni-li'i'*  
           3SG- PAT-see  
           INT    EXT
- c. *∅-*    *ma-li'i'*  
           3SG- VOICE.NSG-see  
           INT    EXT
- d. *Man-*                      *b<in>isita*  
           VOICE.PL- <PAT>visit  
           INT                      EXT

This agreement pattern leads to one indeterminacy. Consider the examples in (144). (144) shows that the two voice markers can co-occur. When the plural voice

32. EXT indicates the internalised external argument, INT is the gloss for the internal argument promoted to “subject”. It is important to note that it is not the marker *-in-* itself that constitutes the agreement with the external argument, but the observation that the agreement is sensitive to the number of the external argument; in the following analysis, *-in-* comes out as the exponent for the [voice:–ag]-feature of V.



marker is left out, as in (144b), then a clause with a plural internal argument can only be interpreted as active. When, however, the plural voice marker is missing in a realis clause with a singular internal argument, as in (144c), then the clause has two readings: The first reading is that the predicate is active, with *ma-* flagging the third person pronominal subject; the second reading that the predicate is passive, with *ma-* flagging the internalised external argument, and the agreement with the internal argument left unexpressed.

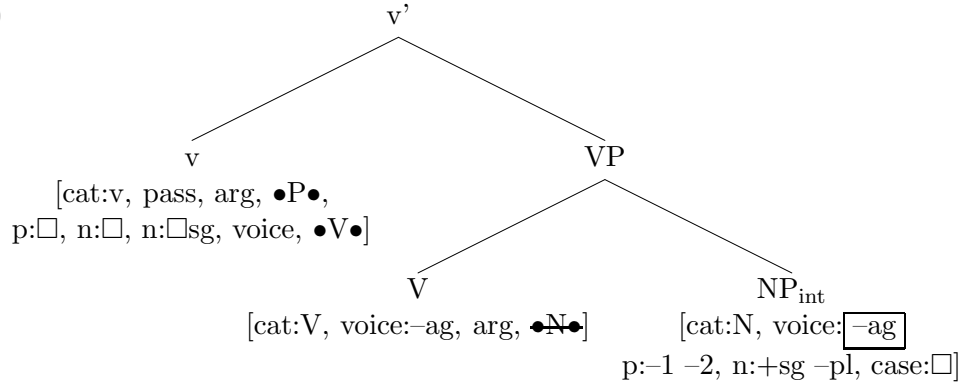
- (144) a. Man-ma-lalatde                      i      famagu'on  
           VOICE.PL-VOICE.NSG-scold DEF children  
           'The children were scolded' (Topping 1973:258)
- b. Ma-lalatde                      i      famagu'on  
           VOICE.NSG-scold DEF children  
           'They are scolding the children'
- c. Ma-lalatde                      i      patgon  
           VOICE.NSG-scold DEF child  
           'The child is scolded' or 'They are scolding the child' (Topping 1973:259)

In what follows, I am proposing a new analysis of passive in Chamorro. The predicate is assumed to be underlyingly transitive (cf. Aldridge 2008), which means that passive *v* has an *[arg]* feature, but it can only merge oblique elements such as PP arguments. In addition, *v* has no *[\*case:acc\*]* feature, and is underspecified for voice. *V* has a *[voice:-ag]*-feature. Due to the absence of the *[\*case:acc\*]*-feature, the internal argument must be last-resort-moved to the edge of *v*, as it receives case from *I*, just as in intransitive derivations.

The absence of the *[+ag]*-feature has the effect that the agent voice marker *-um-* can never be inserted in passive predicates, as *-um-* is specified for *[voice:+ag]*. A second consequence is that *-in-* is inserted when the agent is singular (in most other contexts, *-in-* is blocked by one of the two more specific zero exponents, which are both specified for *[+ag]*). Crucially, the marker *-in-* does not mark the external argument – expressing the *[-ag]* feature of *V*, it marks agreement with the internal argument.

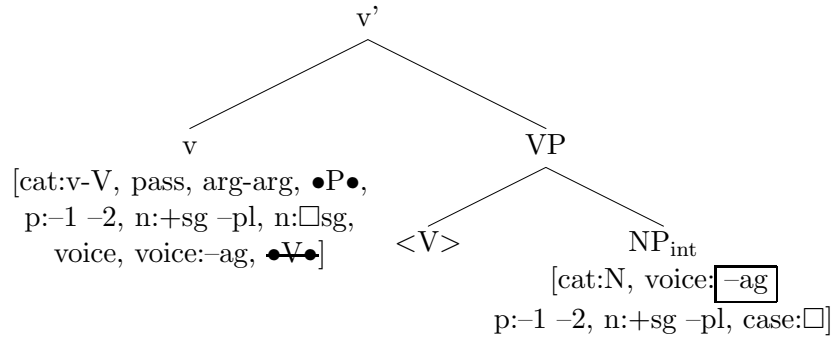
The question remaining is, how can a plural external argument overwrite the patient agreement? The answer is that in passive contexts, the verb agrees with both arguments. It agrees fully with the internal argument, but only partially with the external argument. The feature that the verb agrees in with *NP<sub>ext</sub>* is *[±sg]*. Before I go on with the analysis, let me sketch briefly what has been said so far about passive derivations. (145) shows the derivation at the stage when *v* is merged. As the illustration shows, *v* has an argument-introducing feature, but lacks case, and is underspecified for voice.

(145)



Two things have happened in (146): *v* has valued its  $\phi$ -features by agreeing with  $\text{NP}_{\text{int}}$ , and V-to-*v* movement has taken place.

(146)



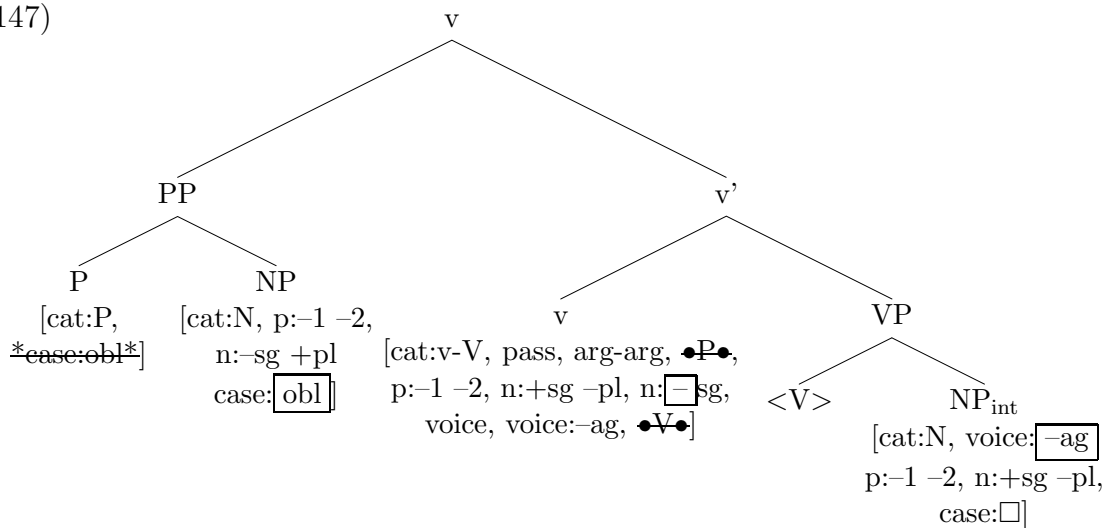
In passive derivations, the valueing of  $\phi$ -features must happen before the external argument is merged. This can be implemented by assuming that in Chamorro, Agree happens before Merge in the context of passive.<sup>33</sup> The single [sg] feature cannot be valued by agreeing with  $\text{NP}_{\text{int}}$  due to a constraint on doubling: Agreeing twice with the same element in the same feature is banned.<sup>34</sup>

In the next stage, the external argument is merged, and *v* values its [n:□sg]-feature by agreeing with it:

33. This assumption can be made on the ground that *v* contains both Agree and structure-building features, which, according to the Earliness Principle, must be dealt with once. In the context of passive, Agree is given priority over Merge. See section 2.2.2, especially page 20ff., for a detailed discussion of this idea and two example analyses.

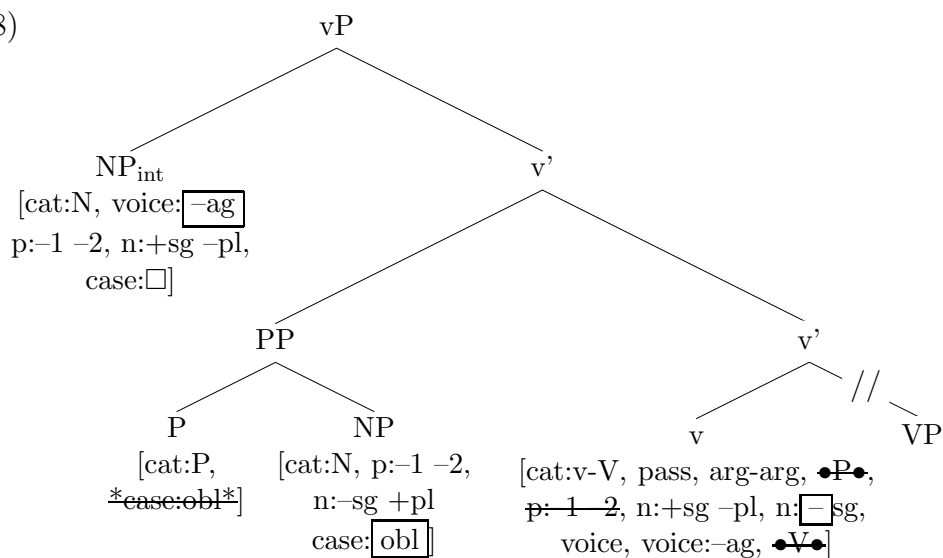
34. This constraint is related to S-IDENT<sub>CONST,FC</sub> (Ortmann and Popescu 2000), \*XX (Grimshaw 1997), to the Obligatory Contour Principle (McCarthy 1986, among others), NoRED (Lahne 2007b), and ultimately goes back to Ross's (1972) Doubling Constraint.

(147)



Now the complement of  $v$  is to be spelled out, but the phase is not balanced yet, as  $\text{NP}_{\text{int}}$  has an unvalued case feature. Consequently, the edge property is inserted into a feature of  $v$  ([pers] in realis, and [arg] in irrealis, according to rule 112), and  $\text{NP}_{\text{int}}$  is moved to the edge of  $v$ . The resulting structure for realis is shown in (148).

(148)



This is how the double number agreement on  $v$  comes about. Now to the markers. There are four possible combinations of external and internal argument (leaving aside the dual cases, which pattern with singular). These are shown in table 13.

Table 13

	NUM-features of arguments	NUM/VOICE-features of $v$
<i>Chamorro Features on <math>v_{\text{pass}}</math></i>	a. $\text{NP}_{\text{ext}}$ : [+sg -pl], $\text{NP}_{\text{int}}$ : [+sg -pl]	[+sg], [+sg -pl], [voice], [voice:-ag]
	b. $\text{NP}_{\text{ext}}$ : [+sg -pl], $\text{NP}_{\text{int}}$ : [-sg +pl]	[+sg], [-sg +pl], [voice], [voice:-ag]
	c. $\text{NP}_{\text{ext}}$ : [-sg +pl], $\text{NP}_{\text{int}}$ : [+sg -pl]	[-sg], [+sg -pl], [voice], [voice:-ag]
	d. $\text{NP}_{\text{ext}}$ : [-sg +pl], $\text{NP}_{\text{int}}$ : [-sg +pl]	[-sg], [-sg +pl], [voice], [voice:-ag]

For convenience, the voice markers matching in passive contexts, i.e., those that are not specified for [+ag], are repeated in (149).

(149) *Chamorro voice markers matching in passive contexts:*

/man-/ ↔ [VOICE, -sg +pl] /\_\_\_ [cat:V]  
 /ma-/ ↔ [VOICE, -sg] /\_\_\_ [cat:V, arg-arg]  
 /-in-/ ↔ [VOICE:-ag]

First of all, person/number-markers can only be inserted once, namely into the fully specified set  $[\pm\text{sg } \pm\text{pl}]$ . They cannot be inserted into the defective feature set  $[\pm\text{sg}]$ , as they are always also specified for person, and they cannot be inserted at all in realis contexts, because *v* then lacks the person feature. However, in irrealis contexts, the person/number markers are the most specific matching markers. They are therefore inserted first into  $[\pm\text{sg } \pm\text{pl}]$ . Left are the two voice features and the defective number feature. When the number feature is  $[+\text{sg}]$  (candidates (a.) and (b.) in table 13), then *-in-* is inserted into  $[\text{voice}:-\text{ag}]$ , but there is no matching marker for the underspecified feature  $[\text{voice}]$ . These are cases like example (142a). When the number feature is  $[-\text{sg}]$  (candidates (c.) and (d.) in table 13), then *-in-* is inserted into  $[\text{voice}:-\text{ag}]$  as before, but now also *ma-* is inserted into  $[\text{voice}, \text{num}:-\text{sg}]$  (example 142d).

Let us now turn again to realis contexts. As no person/number-marker can be inserted here, the fully specified set  $[\pm\text{sg } \pm\text{pl}]$  is still available for insertion. In case (a.), the only matching marker is *-in-*; *man-* and *ma-* cannot be inserted here as they are specified for  $[-\text{sg}]$ . The corresponding example is (142d). In case (b.), *-in-* matches again, but also *man-* is inserted, as there is a specification for  $[-\text{sg } +\text{pl}]$  (example 144a). When the external argument contributes a  $[-\text{sg}]$  feature, as in cases (c.) and (d.), then the presence of the additional  $[-\text{ag}]$  has the effect that *ma-* is always inserted. In (c.), the most specific matching marker is *ma-*; it is therefore inserted into the most specific feature set  $[\text{voice}:-\text{ag } -\text{sg}]$ . As a result, there is no other matching marker for the features left (i.e.,  $[+\text{sg } -\text{pl } \text{voice}]$ ). In case (d.), finally, *man-* is the most specific matching marker, so that now *man-* is inserted into the features  $[\text{VOICE}, -\text{sg } +\text{pl}]$ , and subsequently *ma-* is matched with the remaining  $[\text{VOICE}:-\text{ag}]$ ,  $[-\text{sg}]$ .

One consequence of this analysis is that Chamorro does not have ‘passive’ markers in the sense that they are specified for insertion into passive predicates; rather, the seeming passive markers are in fact voice markers. The analysis showed what the common characteristics are that lead to insertion of the same markers in passive and *wh*-extraction contexts: Passive and intransitive derivations have the common trait that *V*’s complement must be last-resort-moved to the edge of *v*, which accounts for the intransitive marking pattern occurring with passives. Passive and *wh*<sub>int/obl</sub>-extraction share the property that in some cases the patient marker *-in-* is the only matching voice marker. In *wh*-extractions, this is due to the deletion of  $[\text{voice}:+\text{ag}]$  in the course of the derivation; in passive derivations, the reason for it is the absence of the  $[\text{voice}:+\text{ag}]$  on *v*.

#### 4.2.5.8 A Note on Topicalisation

Chamorro is a verb-initial language. There are, however, cases where the subject appears before the verb. These elements show characteristics typical of topics:

They must be proper nouns or definites, or they must be marked by a demonstrative or universal quantifier (Chung 1998:262). In addition, in narratives,

“topics serve to introduce, or reintroduce a character that is in the spotlight. In contrast, clauses whose surface order is predicate-initial do not highlight any participant but merely serve to advance the action.” (Chung 1998:262)

Topics are specifiers of I. This is suggested by examples like those in (150): In (150a), the topic occurs lower than the left-peripheral *wh*-element; in (150b), it occurs to the right of the complementiser.

- (150) a. Hafa si Maria s<in>angane-nña as Joaquin?  
 what UNM Maria <pat>say.to-3SG.POSS OBL Joaquin  
 ‘What did Maria tell Joaquin?’ (Chung 1998:265)
- b. Duda yu’ [kao i ma’estru u-hässu si Maria ]  
 doubt 1SG [Q the teacher 3SG.IRR-remember UNM Maria  
 ‘I doubt whether the teacher is going to remember Maria’ (Chung 1998:265)

Topicalisation does not obey the hierarchy-based restrictions on subjects (Chung 1998:264). In addition, the topic does not need to be fully identical to the subject. This is shown in (151), where the topic is an anaphor to the possessor of the subject NP.

- (151) I mañaiä-hu taya’ tanu’-ñiha  
 DEF parents-1SG.POSS exist.NEG land-3PL.POSS  
 ‘My parents have no land’ (Lit. ‘My parents, their land is not there’)  
 (Chung 1998:264)

Another crucial property of topicalisation is that it is grammatical even when the topic seemingly crosses an island. (152) illustrates the point by means of a complex NP island.

- (152) I che’lu-n Maria taya [[ma’a’ñao-ña ] médiku ]  
 DEF sibling-LINK Maria EXIST.NEG [[afraid-3SG.POSS ] doctor ]  
 ‘Maria’s sister, there are no doctors she’s afraid of’ (Chung 1998:266)

All these properties suggests that topicalisation does not involve movement; rather, the topic serves as anaphor for a null pronoun. This also explains why topics are not subject to constraints on subjects: only full NPs are subject to these restrictions). The same conclusion is drawn in Chung (1998:266) on the basis of these observations.

#### 4.2.6 Verbal Inflection with Long Movement

Long movement has the surprising characteristic that higher verbs do not register the argument status of the passing *wh*-element, but the respective argument status of the clause from which the element is extracted (see section 4.1.4).

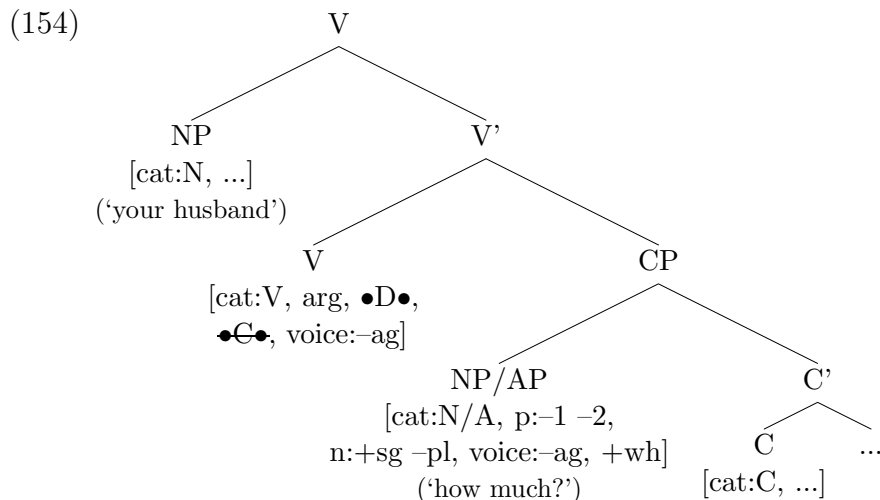
In the new framework, local extraction works in such a way that it is the position the wh-element originates from that determines the kind of special morphology that shows up. In this section, I show that no additional assumptions are needed to model long movement works; the analysis works in exactly the same way as that for local extraction.

Consider again the first example from page 52, which is repeated here:

- (153) Lao kuantā i asagua-mu ma'a'ñao-ña [ pära un-apasi  
 but how-much DEF spouse-2SG.POSS afraid-3SG.POSS [ FUT 2SG.IRR-pay  
 OBL-NMLZ OBJ  
 i atumobit ]?  
 DEF car ]

‘But how much is your husband afraid you might pay for the car?’

The extracted element is the internal argument of the embedded clause. When it is extracted, then the embedded predicate does not show any morphological change, which is a possible reflex of object extraction. However, the extraction of *kuanta* out of the embedded clause causes nominalisation without voice marking on the higher verb. The matrix verb thus behaves as if an oblique element were passing, but what happens is in fact extraction from an oblique element. This can be implemented very easily in the present framework: When arguments are clausal entities, then they are merged in the same location as their nominal counterparts. Both the argument itself and the element(s) at its edge are accessible to the higher probe. Therefore, probe impoverishment is “blind” to the moved item being the entire argument or an element from the edge of the argument. Let me go through the derivation by means of the given example. In (153), the embedded clause is merged as the lowest element in the matrix VP. The wh-element is moved to the edge of the embedded clause due to Phase Balance. The situation is illustrated in (154).

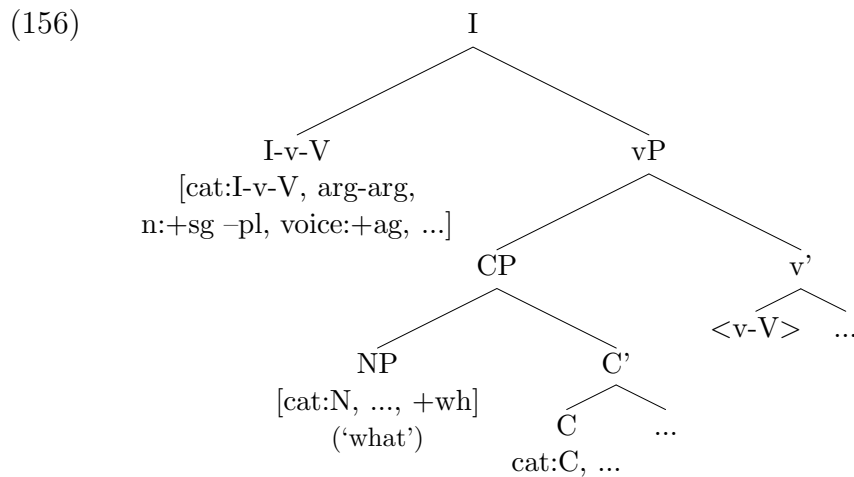


Now the system checks if the VP is balanced, with the result that the element with the wh-feature must be moved to the edge of C. This is yielded by edge property

insertion, and here the same rule applies as above for local extraction from V: the edge feature is inserted into V's categorial feature, with the result that V is nominalised.

In (155), repeated from page 52, the *wh*-element is an oblique element. However, the embedded clause is the external argument of the matrix clause. The corresponding structure is given in (156).

- (155) Hafa um-istotba hao ni malago'-ña i lahi-mu  
 what UM-disturb 2SG COMP want-3SG.POSS DEF son-2SG.POSS  
 SUBJ-*um* OBL-NMLZ  
 'What does it disturb you that your son wants?'



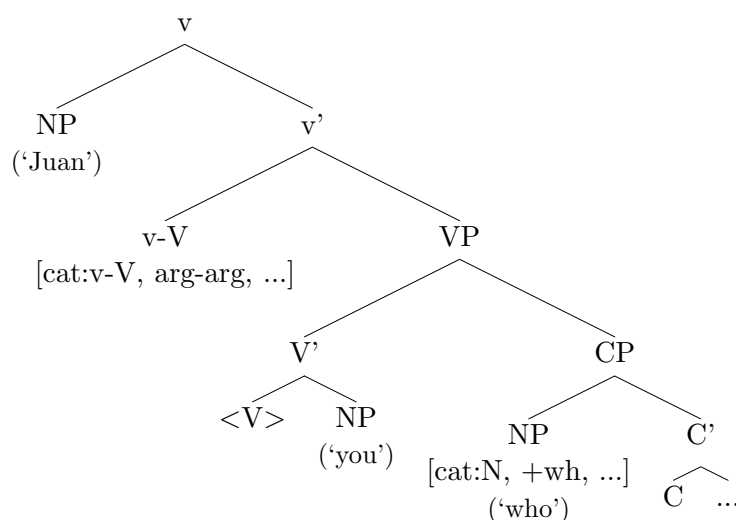
Now phase balance applies, with the effect that the *wh*-element is moved to the edge of I. The edge property is assigned to [voice:–ag] in irrealis contexts, and to [num] in realis contexts, as required by the rules in (106). This yields subject extraction morphology on the matrix verb (the sentential subject constraint does not seem to hold in Chamorro ; see Sabel 2002).

Example (157), repeated here from page 52, involves subject extraction from an object clause.

- (157) Hayi si Juan ha-sangan-i ho b<um>isita si Rita?  
 who UNM Juan 3SG-say-BEN 2SG <UM>visit UNM Rita  
 OBJ SUBJ-*um*  
 'Who did Juan tell you visited Rita?'

The crucial stage of the derivation is shown in (158).

(158)



The embedded CP is base-merged at the edge of V. When the vP is balanced, then the wh-element is moved to v's edge; the edge property insertion proceeds according to rule (140). Here an [arg]-feature is assigned the edge property, so that the derivation now looks just as if the patient argument is extracted from a benefactive structure.

A question that needs to be discussed is which feature of C is assigned the edge property when an element is moved to the edge of C in a last-resort operation. In Chamorro, the complementiser does not alter in the same way as the verb agreement: There is C-agreement with extraction, but only on the complementiser as whose specifier the moved element finally appears; i.e., the C head that internally merges the movee by satisfying one of its own features (e.g. [+wh]). This kind of agreement is therefore not in the scope of this analysis; what concerns us here are the C heads through which the wh-element is passing. The markers for these heads are listed in table 14 (from Chung 1998:223).

Table 14

*Chamorro*  
*Realisations of C*

Specification of C	Marker
[−finite]	∅
[+finite, −Q, +root]	∅
[+finite, −Q, −root]	na/ ∅
[+finite, +Q, +root]	kao/ ∅
[+finite, +Q, −root]	kao

I propose the following marker specifications:

- (159) *Vocabulary items for C:*  
 /∅/ ↔ [+finite −Q +root]  
 /na/ ↔ [+finite −Q]  
 /kao/ ↔ [+finite +Q]  
 /∅/ ↔ [cat:C]

These vocabulary items, taken alone, do not account for the optional markers. I assume that the optionality is triggered by an independent factor which can ban



the insertion of the best-matching markers in the contexts  $[-Q, -root]$  and  $[+Q, +root]$  – then the most general marker ‘ $/\emptyset/ \leftrightarrow [cat:C]$ ’ is inserted. The relevant contexts are the  $[-root]$ -contexts. As already mentioned, the markers for these contexts do not change when a *wh*-element is passing. Therefore, the feature deleted in the course of successive-cyclic movement must be one that does not lead to the insertion of a different marker. I propose that it is the  $[root]$ -feature. The edge property insertion rule for *C* is thus the following:

- (160) *Edge property insertion rule for C:*  
 $[\text{root}] > [\bullet \text{root} \bullet]$

#### 4.2.7 Summary: Edge Property Insertion

The edge property insertion rules used in this analysis are summarised in (161) to (165).

- (161) *Edge property insertion rule for V:*  
 $[\text{cat:V}] > [\bullet \text{cat:V} \bullet]$
- (162) *Edge property insertion rules for v:*  
 $[\text{arg}] > [\bullet \text{arg} \bullet] / \_\_ [\text{arg-arg -pass}]$   
 $[\text{arg}] > [\bullet \text{arg} \bullet] / \_\_ [+ \text{irr}]$   
 $[\text{pers}] > [\bullet \text{pers} \bullet] / \_\_ [- \text{irr}]$
- (163) *Edge property insertion rules for n:*  
 $[\text{voice: +ag}] > [\bullet \text{voice: +ag} \bullet] / \_\_ [\text{cat:N arg-arg-arg}]$   
 $[\text{arg}] > [\bullet \text{arg} \bullet] / \_\_ [\text{arg-arg}]$   
 $[\text{voice: +ag}] > [\bullet \text{voice: +ag} \bullet] / \_\_ [\text{arg}]$
- (164) *Edge property insertion rules for I:*  
 $[\text{voice: -ag}] > [\bullet \text{voice: -ag} \bullet] / \_\_ [\text{cat:V +irr arg-arg}]$   
 $[\text{num}] > [\bullet \text{num} \bullet] / \_\_ [\text{cat:V -irr arg-arg}]$   
 $[\text{arg}] > [\bullet \text{arg} \bullet] / \_\_ [\text{arg}]$
- (165) *Edge property insertion rule for C:*  
 $[\text{root}] > [\bullet \text{root} \bullet]$

#### 4.2.8 Consequences of the New Analysis

The new approach has a number of theoretical consequences. First of all, it is a unifying analysis of verbal morphology in extraction, control and passive contexts which recognises syncretisms in verbal morphology. The syncretic forms have been shown to be no accidental homonyms, but voice markers emerging whenever last-resort movement to the edge takes place.

A striking property of the new analysis is that it works without restrictions on extraction, but yields the same effects. For example, the standard analysis of passivisation in the context of successive-cyclic movement in Austronesian languages is that there is a restriction on extraction that has the effect that only

the structurally highest argument can be extracted (“subject-only”-restriction). When an internal argument is to be extracted, then this must happen via passivisation (Keenan and Comrie 1977, 1979, Kroeger 1993, Aldridge 2004, Rackowski and Richards 2005, Cole et al. 2008, among many others). In other words, in the standard analysis, there are restrictions on extraction which have the effects that construction A (recognisable by the marker M) must be formed before extraction can take place. The new analysis, on the other hand, has the advantage that restrictions on extraction are not needed, at least not for Chamorro. Rather, any element can be extracted, but the extraction of certain elements automatically makes the outcome of the derivation look like construction A, because the feature sets of probes along the path of the moved element are manipulated, so that at vocabulary insertion, M, which would normally be blocked by more specific markers, is the only matching marker now.

There are a number of phase-based accounts of extraction restrictions based on the idea that only elements at the phase edge can be extracted (Aldridge 2004, Rackowski and Richards 2005, Aldridge 2008, Cole et al. 2008). These analyses derive the “subjects-only”-constraint by assuming that the internal argument of transitive verbs, which is not located at a phase edge, cannot be extracted to the edge of the phase head *v*. When, on the other hand, the structure is passive, then the internal argument is located at the edge of *v*, and is therefore accessible to a higher probe. These analyses have the disadvantage that they do not treat local movement and long movement in a uniform way. If last-resort movement to the phase edge is impossible, then long movement cannot be modeled at all. A mechanism like Phase Balance/EPP Feature Insertion/Last Resort-Movement *must* therefore be assumed to be at work. But then either any element can be moved to the edge of *v* (or any other phase head, for that matter), or long and local movement are assumed to be different operations. The latter assumption, however, can arguably not be modeled without look-ahead, and is arguably not a desideratum for an efficient derivational system. The new analysis has the advantage that the (seeming) extraction restrictions are derived, and at the same time local and long movement receive a uniform analysis.

In a way, the new approach is indeed very close to the analysis proposed by Chung (1994, 1998). As Chung (1994) points out,

“the function of wh-agreement is to indicate that there is a trace that is *unbound* within some specific domain – a trace that has not found yet an anchor, in the sense that its  $\bar{A}$ -antecedent lies outside the domain in question.” (Chung 1994:10)

This is exactly what happens here: The special morphology is due to deletion of phase head features, which in turn happens to satisfy Phase Balance. Edge perproperty insertion, however, **only** takes place when the feature that triggers the movement to the edge (e.g. [+wh] of C) is not in the structure yet. In other words, last-resort movement only happens when the movee *has not found yet an anchor*. If the probing feature (e.g. [+wh] of C) is in the structure (i.e., if the “anchor” is in the currently available domain), then this feature itself triggers the movement,

and the phase head is not impoverished.

Moreover, the new approach shifts Impoverishment from a post-syntactic component to the syntax, and provides a new argument for finite control as movement.

Finally, a very important consequence is that the nominalisation in the context of successive-cyclic movement is evidence in favour of V as a phase head.

### 4.3 More Data and Analyses

#### 4.3.1 Complementiser Selection in Modern Irish

##### 4.3.1.1 Data

In Irish, all complementiser-like particles between a *wh*-phrase or relativised element and its base-merge site show a special form: Instead of the regular form  $go^N$ , the particle  $a^L$  appears, immediately preceding the verb and forming a prosodic unit with it (McCloskey 1979, 2001, among others).<sup>35</sup>  $a^L$  and  $go^N$  are in complementary distribution. Some examples are given in (166) and (167).

- (166) a. Cé  $a^L$  dhíol an domhan?  
           who     sold   the world  
           ‘Who sold the world?’ (McCloskey 1979:52)
- b. an fear  $a^L$  dhíol an domhan  
           the man     sold   the world  
           ‘The man who sold the world’
- (167) a. Mheas mé [gu- $r^L$  dhúirt sé [gu- $r^L$  thuig sé an  
           thought I [that-PST said he [that-PST understood he the  
           t-úrscéal ]]  
           novel     ]]  
           ‘I thought that he said that he understood the novel’ (McCloskey 1979:17)
- b. An t-úrscéal  $a^L$  mheas mé [ $a^L$  dúirt sé [ $a^L$  thuig sé ]]  
           the novel           thought I [ said he [ understood he ]]  
           ‘the novel that I thought he said he understood’ (McCloskey 1979:17,54)
- c. Cén t-úrscéal  $a^L$  mheas mé [ $a^L$  dúirt sé [ $a^L$  thuig sé ]]  
           which novel           thought I [ said he [ understood he ]]  
           ‘Which novel did I think he said he understood?’ (McCloskey 1979:54)

There is a third particle  $a^N$ , which is in complementary distribution with  $go^N$  and  $a^L$ .  $a^N$  occurs whenever relativisation involves resumption. Compare (168a), which shows relativisation with  $a^L$ , to (168b), where the resumptive strategy of relativisation is chosen.

- (168) a. an scríbhneoir  $a^L$  mholann na mic léinn  
           the writer           praise   the boy.PL learning.GEN.SG  
           b. an scríbhneoir  $a^N$  molann na mic léinn é  
           the writer           praise   the boy.PL learning.GEN.SG him  
           ‘The writer whom the students praise’ (McCloskey 1979:6)

The particles  $go^N$ ,  $a^L$  and  $a^N$  vary in with regard to tense (past/non-past) and clause type (affirmative/negative). The paradigms are shown in table 15.

35. The superscript ‘L’ signals that the particle gives rise to lenition of the following consonant. ‘N’ is the sign that a lexical item causes nasalisation of the following consonant.

Table 15

Table 15

		NON-PAST	PAST
<i>go</i>	AFFIRMATIVE	go <sup>N</sup>	gu-r <sup>L</sup>
	NEGATIVE	nách <sup>N</sup>	ná-r <sup>L</sup>
<i>a<sup>N</sup></i>	AFFIRMATIVE	a <sup>N</sup>	a-r <sup>L</sup>
	NEGATIVE	nách <sup>N</sup>	ná-r <sup>L</sup>
<i>a<sup>L</sup></i>	AFFIRMATIVE	a <sup>L</sup>	a <sup>L</sup>
	NEGATIVE	nách <sup>N</sup>	ná-r <sup>L</sup>

*Irish  
Particles*

The pattern becomes more complex when long relativisation co-occurs with re-sumption:  $A^N$  still appears in the clause the head noun originates from, whereas all higher clauses show the particle  $a^L$ :

- (169) a. Measann sibh [ $go^N$  bhfuil an eochair insa doras ]  
 think you(PL) [ is the key in.the door ]  
 ‘You think that the key is in the door’ (McCloskey 1979:18)
- b. an doras  $a^L$  mheasann sibh [ $a^N$  bhfuil an eochair ann ]  
 the door think you(PL) [ is the key in.it ]  
 ‘The door that you think the key is in’ (McCloskey 1979:19)
- (170) a. Deir siad [ $go^N$  mheasann sibh [ $go^N$  bhfuil an eochair insa doras ]]  
 say they [ think you(PL) [ is the key in.the door ]]  
 ‘They say that you think the key is in the door’
- b. an doras  $a^L$  deir siad [ $a^L$  mheasann sibh [ $a^N$  bhfuil an eochair ann ]]  
 the door say they [ think you(PL) [ is the key in.it ]]  
 ‘The door that they say you think the key is in’

These are the basic data. In addition,  $a^L$  also appears in comparative and equative clauses, clefts, manner and temporal adverbial clauses, and *devil*-left dislocation (McCloskey 2001:70f.):

- (171) a. Níl sé chomh maith<sub>i</sub> agua  $a^L$  dúradh [ $a^L$  bheadh sé  $t_i$  ]  
 NEG-is it as good as said.PST.IPRS [ be.COND it ]  
 ‘It’s not as good as it was said that it would be’
- b. níos ísle<sub>i</sub> ná  $a^L$  ceapadh [ $a^L$  bheadh sé  $t_i$  ]  
 more low than thought.PST.IPRS [ be.COND it ]  
 ‘lower than it was thought it would be’
- c. Ba [i nDoire]<sub>i</sub>  $a^L$  dúradh [ $a^L$  fuarthas é  $t_i$  ]  
 COP.PST [in Derry] say.PST.IPRS [ find.PST.IPRS it ]  
 ‘It was in Derry that it was said it was found’
- d. Sean-aimseartha<sub>i</sub>  $a^L$  deir muintir an bhaile [ $a^L$  tá sí  $t_i$  ]!  
 old-fashioned say people the townland.GEN [ is she ]  
 ‘It’s old-fashioned that the people of the townland say she is’

- e. mar a<sup>L</sup> chloisimid [a<sup>L</sup> dh'imthigh ar Níobé t ]  
 as hear:1PL [ went on Níobé ]  
 'as we hear happened to Niobe'
- f. nuair a<sup>L</sup> tháinig siad na bhaile  
 when came they the.OBL home  
 'when they came home'
- g. Dheamhan pingin<sub>i</sub> a<sup>L</sup> bhí t<sub>i</sub> aige  
 devil penny be.PST at.him  
 'He hadn't a single penny'

All these contexts involve movement of an element from the v-domain to the left edge of the clause.

Finally, *a<sup>L</sup>* also appears in non-finite clauses when the object is shifted before the verb:

- (172) Ba mhaith liom [Seán an caora a<sup>L</sup> mheá ar an bhfeirm ]  
 is good with [Seán the sheep weigh on the farm ]  
 'I would like Seán to weigh the sheep on the farm' (Noonan 2002)

There are two additional observations that are relevant. Firstly, whenever *a<sup>L</sup>* is present in a clause with present or future tense, the verb optionally shows a special suffix *-s* (=“relative” verb form) which replaces all person-number related suffixes (i.e., the synthetic, analytic and impersonal endings):

- (173) Cá h-uair a<sup>L</sup> thiocfa-s tú ` na bhaile ?  
 what time come.FUT-‘s’ you the.OBL home  
 ‘When will you come home?’ (McCloskey 2001:72)

Secondly, there are a number of verbs that possess two kinds of paradigms in some tenses, the so-called “dependent” and “independent” forms. The formal difference between the paradigms can be lexically or phonologically conditioned. For some verbs, the dependent form is formed by suppletion; for other verbs, the difference is conditioned by the accent: dependent forms are prototonic, and independent forms have deuterotonic accent (Sabine Häusler, p.c., Lühr 2004).

The “dependent” form mainly appears after *go<sup>N</sup>*, the interrogative particle *an*, and the negation marker *ní/chan* (in matrix clauses) and *ná* (in embedded clauses).

- (174) a. Creidim go<sup>N</sup> bhfaca mé do nighean  
 believe.1SG see.PAST.DEP I your daughter  
 'I believe that I saw your daughter' (McCloskey 2001:79)
- b. An bhfaca tú mo nighean?  
 Q see.PAST.DEP you my daughter  
 'Did you see my daughter?'
- c. Ní (chan) fhaca tú mo nighean  
 NEG see.PAST.DEP you my daughter  
 'You didn't see my daughter'

The “independent” form appears in non-negated declarative root clauses, and when the particle  $a^L$  is present.

- (175) a. Chonaic            tú    í  
           see.PST.NDEP you her  
           ‘You saw her’
- b. an bhean  $a^L$  chonaic            tú  
           the woman    see.PST.NDEP you  
           ‘the woman that you saw’

#### 4.3.1.2 Analysis

There are two basic views of the particle  $a^L$ : According to McCloskey (1979, 2001, 2002), among others, all particle are complementisers, realising  $C^o$ . The special complementiser  $a^L$  occurring when a wh-element or its trace is a specifier of  $C^o$  is a reflex of the agree relation that takes place between C and wh-element when the wh-element is internally merged with  $C'$ .  $A^L$  in finite and non-finite clauses are taken to be homonyms. On the other hand, it has been argued for e.g. by Sells (1984), Noonan (1992, 2002) that  $a^L$  is a verbal particle. Noonan (2002), for example, proposes that the particle  $a^L$  in finite and non-finite contexts is one and the same marker, indicating object shift in the verbal domain (which is taken as evidence for reflexes of successive-cyclic movement in the verbal domain). Noonan (2002) formulates the following generalisation: “Whenever the subject or object DP is positioned to the left of the surface position of the verb,  $a^L$  occurs”. Resumption, which always gives rise to the particle  $a^N$ , is generally assumed to not involve movement (McCloskey 2002, among others).

The analysis I am proposing here is actually a combination of both views. What is new is the probe impoverishment framework. In the new analysis,  $a^L$  (“object shift marker”) and  $a^L$  (“agreeing complementiser”) are taken to be one and the same marker, as in Noonan (2002). So what is  $a^L$ , complementiser or verb particle? Before I answer that question, I would like to note that there is no such thing as a ‘complementiser’ *per se*. What is generally glossed as a complementiser is actually a marker specified for clause status ( $\pm$ root), clause type (=force), finiteness etc., or a combination of these features. In the new analysis, the preverbal particles are indeed vocabulary items inserted into the feature set of the verb, but some of them are specified for clause status and clause type, so that they can only be inserted when the verb has moved to C.<sup>36</sup> This is assumed to be the case in finite clauses. In non-finite clauses, the verb stays lower in the structure, so that only those particles can be inserted into the feature set of the verb which are not specified for C properties. I propose the following feature specifications for the preverbal particles examined here:

36. The underlying theory of vocabulary insertion is such that more than one vocabulary items can be inserted into one and the same syntactic context (see section 4.2.3.3). Both the verb and the particle can thus be inserted into the feature set of C.

(176) *Feature specifications for Irish preverbal particles:*<sup>37</sup>

- $/go^N/ \leftrightarrow [-root, +decl, +aff, +assr, +fin]$   
 $/\emptyset/ \leftrightarrow [+aff, assr, fin]$   
 $/a^N/ \leftrightarrow [+aff, assr]$   
 $/a^L/ \leftrightarrow [+aff]$   
 $/ná(ch)/ \leftrightarrow [-aff]$

The basic idea is that  $go^N$  and  $a^N$  are specified for combinations of verbal and clausal features. The item  $a^L$  is an affirmation marker, specified for  $[+affirmative]$ . The insertion of  $a^L$  is usually blocked by the more specific vocabulary items  $/go^N/$ ,  $/\emptyset/$  and  $/a^N/$ , which are all specified for  $[+aff]$ , too. This changes when successive-cyclic movement is involved. In a nutshell, the phase heads on the path of the moved element are impoverished by edge property insertion in such a way that the more specific markers do not fit anymore into the given syntactic context;  $a^L$  is then the only matching marker. We are now able to reformulate Noonan's (2002) generalisation in the light of the new theory:  $a^L$  occurs whenever an element is successive-cyclically moved.

Let me now present the analysis in detail. In Irish, successive-cyclic movement proceeds by edge property insertion (i.e., the ECOM is higher ranked than the IC). The edge property is fused with the feature  $[\pm assertive]$ . As the minimal category that is assigned a truth value is the vP,  $[\pm assr]$  is originally a feature of v which moves upwards together with the verb.

(177) *Edge property insertion rule:*

- $[\pm assr] > [\bullet \pm assr \bullet]$

On which head does (177) apply? Crucially, the C head that finally attracts the moved element shows the underspecified marker, too, although it is not impoverished. Within the current theory, this suggests that probe impoverishment happens on a head below C. Remember from examples (166) and (172) that  $a^L$  appears with both subject questions and object shift. I would therefore like to propose that the edge property insertion is not defined for a specific head; rather, it applies whenever the system encounters the feature  $[+assertive]$  or  $[-assertive]$ . (177) can thus apply on either v or I. It is, however, the only rule specified. Consequently, although ECOM is higher-ranked than the IC, it can nevertheless be violated if no insertion rule applies. Therefore, if  $[\pm assr]$  is deleted on v, then the last-resort movement to the edge of I proceeds non-feature-driven. Likewise, movement to the edges of C and V is a non-feature-driven operation.

In what follows, I am going through two derivations, that of example (167c), and that of (172). Let us first take example (167c), which I repeat here as (178).

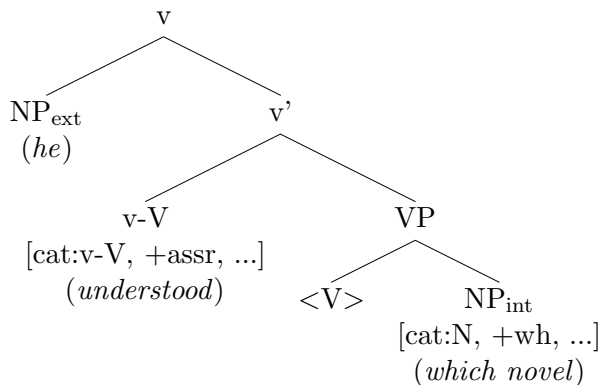
- (178) Cén t-úrscéal  $[_{C_1} a^L]$  mheas mé<sub>1</sub>  $[[_{C_2} a^L]$  dúirt sé  $[[_{C_3} a^L]$  thuig sé]]  
 which novel thought I [ said he [ understood he]]  
 'Which novel did I think he said he understood?'

37. The lack of the  $\pm$ -value of a feature [F] indicates that the marker is underspecified for [F]. Thus,  $/\emptyset/$  is not specified for the value 'finite', but underspecified for finiteness.

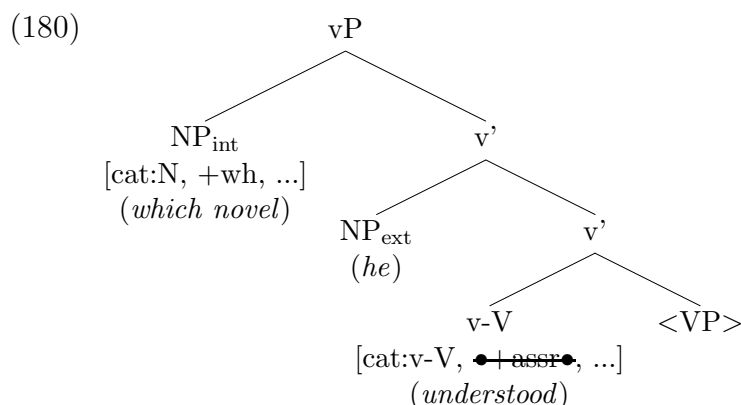


The derivation as it is shortly before the lowest  $v$  phase is balanced is shown in (179).

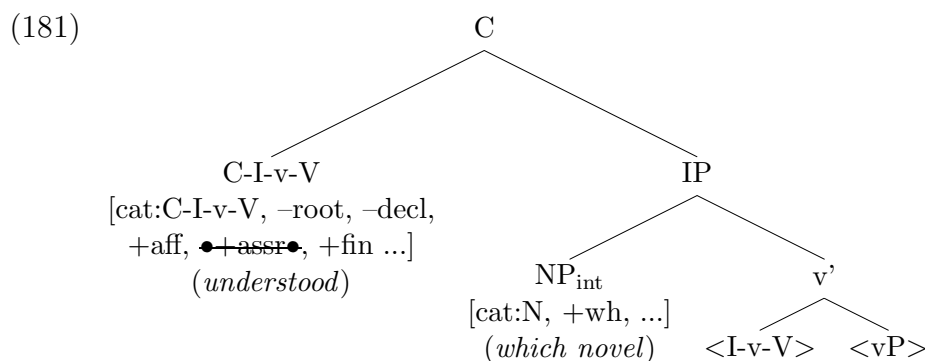
(179) Num:  $\{C_1_{[\bullet+wh\bullet]}, \dots\}$



Now Phase Balance applies and reports back that there is a  $[\bullet+wh\bullet]$ -feature in the numeration, but no  $[wh]$ -feature potentially available. Consequently, the internal argument, which contains such a feature, must be moved to the edge of  $v$ . This is yielded by edge property insertion. The edge property is fused with the feature  $[+assr]$ ,  $NP_{int}$  is extracted, the edge feature is deleted, and the VP is Transferred. The resulting structure is shown in (180).



Phase Balance happens again when the I phase is completed, with the result that the  $wh$ -phrase is moved to the edge of I, but this time in a non-feature-driven operation, as there is no impoverishment rule other than (177), and  $[+assr]$  is already deleted. Now  $C_3$  is merged, and I-to-C movement takes place:



As all other markers are specified for assertion, the only matching marker for  $C_3$  is  $a^L$ .

Now consider the next higher C head,  $C_2$ . The original feature set of  $C_2$  is [cat:C-I-v-V, -root, +decl, +aff, +assr, +fin, ...]. The most specific matching marker would be  $go^N$ , which is indeed inserted if no wh-element passes (see example 167a). In the example in question, however, the feature set of  $C_2$  is impoverished due to the passing wh-phrase.  $C_2$  now only contains [cat:C-I-v-V, -root, +decl, +aff, +fin, ...]. Now  $go^N$  cannot be inserted anymore; the only matching marker is  $a^L$ .

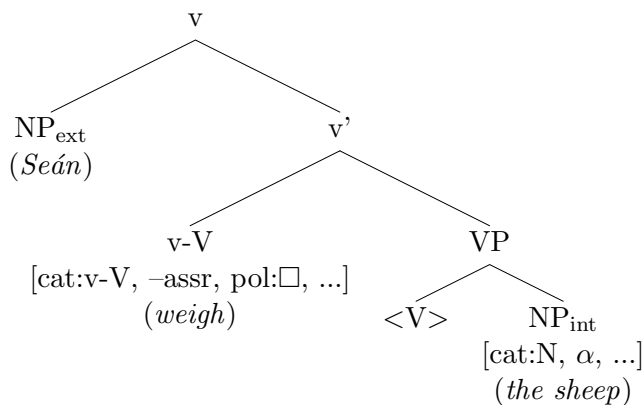
Subsequently, the wh-phrase moves through the edges of matrix v and I, which again leads to the deletion of [+ass].  $C_1$  is thus, just as  $C_2$ , specified for [cat:C-I-v-V, +root, -decl, +aff, +fin, ...]. Again,  $a^L$  is the only matching marker.

The second example is object shift within non-finite clause. In the new analysis, the particle  $a^L$  in examples like (172), which is repeated here as (182), indeed comes out as a reflex of the object shift.

- (182) Ba mhaith liom [Seán an caora  $a^L$  mheá ar an bhfeirm ]  
       is good with [Seán the sheep weigh on the farm ]  
       ‘I would like Seán to weigh the sheep on the farm’

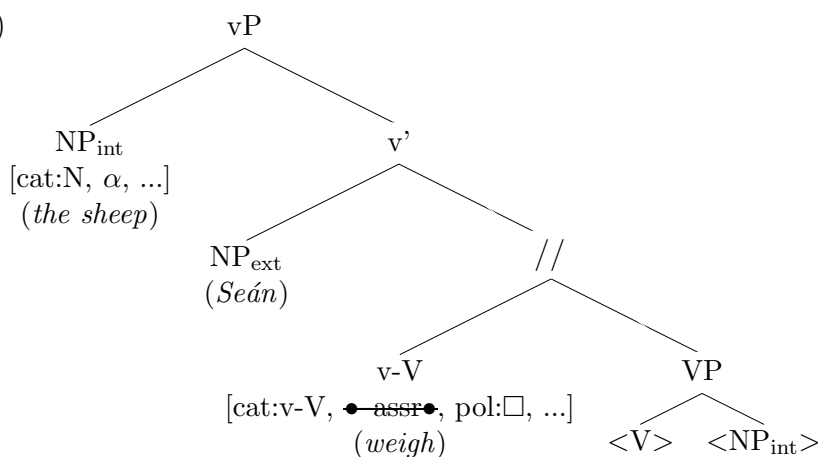
Before we can embark on the analysis, I need to address some theoretical issues. It is generally assumed that in non-finite clauses, the verb stays in v. At first sight, this seems to be a challenge for the new analysis, as  $a^L$  is now analysed as an affirmative particle, and polarity generally seems to be located above v (e.g. Laka 1990, Zanuttini 1997);  $a^L$  can, however, not be separated from the verb by any material. This issue can be solved by a minimal change in the featural system involved: the polarity feature is a feature [ $*\pm\text{aff}^*$ ], which is assigned by I and valued on the verb. In addition, the analysis of  $a^L$  as an affirmative particle predicts that non-finite clauses are IPs. Furthermore, if the occurrence of  $a^L$  is a consequence of last-resort movement, then  $\text{NP}_{\text{int}}$  must make at least one last-resort movement step. I assume that this step is the movement from the edge of V to the edge of v, although the internal argument does not move further. This is yielded in the following way: In object shift derivations, the head I contains a feature that I am referring to by the variable [ $*\alpha^*$ ]. This feature must be satisfied by a feature [ $\alpha$ ] of  $\text{NP}_{\text{int}}$ .  $\text{NP}_{\text{int}}$  is however base-merged within the VP and therefore not in the search space of I. The only way for  $\text{NP}_{\text{int}}$  to become accessible for I is by last-resort movement to the edge of v (just as in ergative languages, where  $\text{NP}_{\text{int}}$  is assigned external case by I).

Let us now look at the derivation in detail. The relevant stage is the point at which the v phase is almost completed:

(183) Num:  $\{I_{[*\alpha^*]}, \dots\}$ 

The VP is the portion that is to be spelled out. The numeration contains a feature  $[\alpha^*]$ , and the only detectable corresponding feature  $[\alpha]$  is not potentially available. As a consequence, the edge property is fused with the feature  $[-assr]$ , and  $NP_{int}$  is moved to the edge of  $v$ ; then the VP is Transferred. The resulting structure is shown in (184).

(184)



Subsequently,  $I$  is merged, and deals with its  $[\alpha^*]$ -feature by matching/agreeing with  $NP_{int}$ . Note that the structure is not adequate yet, as it displays OSV order – the order observed is SOV. I assume, following Lahne (2008a), that the SOV order is due to a linearisation rule, which either tucks  $NP_{int}$  in below  $NP_{ext}$ , or last-resort moves  $NP_{ext}$  either within the edge of  $v$ , or to the edge of  $I$ .

At vocabulary insertion, the “regular” marker appearing in non-finite contexts,  $/\emptyset/$ , does not fit anymore now, as it is specified for  $[assr]$ . The only matching marker is  $a^L$ .

In the new analysis, the occurrence of  $a^L$  is independent of the nature of the moved element – it does not need to be the object. This gives rise to the prediction that the underspecified affirmative particle occurs in non-finite clauses, too, when a non-object is last-resort moved to the edge of  $v$  or  $I$ . The prediction is indeed borne out: There is dialectal variation with regard to non-finite clauses. In Southern Irish dialects,  $a^L$  also occurs with intransitive (=unaccusative and unergative) predicates if the subject is lexically overt. In addition, the order ‘O  $a^L V$ ’ is restricted to



particle *an*, and the negation marker *ní/ ná*, whereas the “independent” form appears in non-negated declarative root clauses and whenever  $a^L$  is present. At first sight, the choice of paradigm does not seem to follow a pattern. In addition, there does not seem to be a specific grammatical category that these forms are specified for – the appearance of the one or the other form seems to be determined on formal grounds, but idiosyncratic.

I would like to propose that these verbs have two roots, one contextually specified for [+root +aff] (=“independent” form), the other specified for [assr] (=“dependent” form). The two root forms of *feic*- ‘see’, which appeared in the examples (174) and (175), are given in (187).

- (187) *Exemplary vocabulary items for dependent and independent verb forms*  
 /chonaic/ ↔ [SEE, preterite] \ \_\_\_ [+root +aff]  
 /faca/ ↔ [SEE, preterite] \ \_\_\_ [assr]

The “independent” (=affirmative) form is inserted in affirmative root contexts only, and the “dependent” (=underspecified assertive) form is inserted in all other contexts, e.g. in non-affirmative clauses and all non-root clauses. So far, this system derives the correct forms apart from those appearing in non-root  $a^L$ -contexts: When the system encounters an impoverished non-root verbal head, then none of the available markers matches – the “independent” form does not fit as the context is [–root], but neither does the “dependent” form fit, as the feature [ $\pm$ assr] was deleted during the derivation. The solution I am proposing is that there is a condition on vocabulary insertion according to which verbal roots *must* be marked by an exponent. Consequently, when there is no matching marker, then the Subset Principle can be minimally violated by inserting a non-matching marker; it must, however, be the marker that violates the Subset Principle least of all available markers. In our case, the least offending marker is the “independent” form, as here it is only the value of a single feature (=‘-’) that does not fit. The “dependent” form is dispreferred, as it contains a whole feature (= [assr]) that is not contained in the syntactic context. Therefore, the “independent” form is the winning marker for both non-negated declarative root contexts and all  $a^L$ -contexts.

Finally, remember the optional suffix *-s*, which can show up in present or future tense whenever  $a^L$  appears (= “relative” verb form; see example 173). Let me briefly sketch an analysis for this phenomenon. Crucially, the marker *-s* replaces all person-number related suffixes; i.e., the regular person-number markers (=“synthetic” forms, which exist only for some persons and numbers, depending on the verb class), underspecified person-number markers (“analytic” forms), and impersonal endings. Given that the specifications for all these markers contain the features [person] and [number], the occurrence of the marker *-s* can be explained as a blocking effect: The regular non-past person-number markers can be additionally contextually specified for [assr].<sup>38</sup> If they are, then they cannot be inserted whenever [assr] has been deleted in the course of the derivation.

Let me illustrate this by means of the verb *tar*- ‘come’, which was used in example (173) to illustrate the “relative” verb form. For this verb, the future is formed

38. Note that this account presupposes a theory of optionality, which I will not go into here.

entirely analytically, i.e., by an underspecified person-number marker *-idh* plus a personal pronoun. The regular form is shown in (188).

- (188) *tioc*<f>*a-idh*                      *tú*  
       *come*<FUT>-‘ANALYTIC’ *you*  
       ‘you will come’

Whenever  $a^L$  occurs, then the underspecified suffix can be replaced by *-s*:

- (189)  $a^L$  *tioc*<f>*a-s*                      *tú*  
       *come*<FUT>-‘S’ *you*  
       ‘you will come’

The idea is that */-s/* is a kind of “analytic” form, too, in the sense that it is an underspecified person-number marker, which is contextually specified for non-past contexts. */-idh/* can be additionally specified for [assr]:

- (190) *Some vocabulary items for Irish*  
       */-idh/* ↔ [pers num] \ \_\_\_ [-pst -pres (assr)]  
       */-s/* ↔ [pers num] \ \_\_\_ [-pst]

When */-idh/* is also specified for [assr], then it is blocked in the same contexts in which  $a^L$  occurs, as then [assr] has been deleted in the course of the derivation, so that */-s/* is the only matching marker. When */-idh/* is not specified for [assr], then it is the most specific matching marker for the future context; consequently, */-idh/* is inserted, and */-s/* is blocked.

### 4.3.2 Tonal Reflexes in Kikuyu

#### 4.3.2.1 Data

In Kikuyu, movement of *wh-*, relativised and focused elements has an effect on the tonal pattern of a sentence. All **verbs of affirmative main clauses** in which no *wh*-movement, focusation or relativisation has taken place appear with a tonal downstep that affects the tonal pattern of following segments (Clements 1984b:317). The “downstep element” is a word-final floating extra-low tone which is not associated with tone-bearing units (Clements and Ford 1979, Clements 1984b,a).<sup>39</sup> It appears at the end of the first phrasal constituent following the verb; if this constituent ends with a high tone, the downstep is displaced to the right of any following sequence of underlyingly low-toned syllables (Clements et al. 1983, Zaenen 1983). This low tone has the following effects on the tonal pattern of a sentence: Firstly, it causes preceding low tones to change into high tones; this process stops at syllables with an underlying high tone. Secondly, whenever the “downstep” appears in a non-sentence-final position, then all following tones are produced in a lower pitch register (i.e., they are “downstepped”). Thirdly, if the floating low tone appears in a sentence-final position, then it blocks the otherwise

39. Diachronically, the floating low tone is derived from a word-final low tone. It is the result of a tone shift by which all underlying tones were realised one syllable to the right.

exceptionless rule that one or more high or raising tones in absolute sentence-final position are changed to low.

Let me illustrate the phonological effects of the floating low tone by means of two examples. The verb form ‘told’ underlyingly bears a floating low tone. The underlying tones of ‘Kanake’, ‘that’ and ‘Karioki’ are shown in (192).<sup>40</sup>

- (191) é:<sup>!</sup>r-íré-<sup>!</sup>  
 SP.tell-PST.CP-TDOWN  
 ‘told’
- (192) a. /ka:náké/ ‘Kanake’  
 b. /ate/ ‘that’  
 c. /kariokĩ/ ‘Karioki’

In the clause ‘Kamau told Kanake that Kariūki cut the tree’, the free low tone of the matrix verb cannot float to the end of the following constituent ‘Kanake’, as /ka:náké/ ends on a high tone; likewise, it cannot attach to ‘ate’, as the complementiser is not a phrasal constituent. Instead, the low tone floats behind the low-toned sequence /kario/ of the following phrasal constituent ‘Karioki’, as shown in (193).<sup>41</sup>

- (193) Kamaú é:<sup>!</sup>r- ré                      Ka:náké [áté Káriók.í á-tém-íré                      mótě ]  
 Kamau SP.tell-PST.CP Kanake [that Kariūki SP-cut-PST.CP tree ]  
 ‘Kamau told Kanake that Kariūki cut the tree’ (Zaenen 1983:473)

The floating low tone has the effect that all tones following it are downstepped, and that the underlying low-toned sequences /kario/ and /ate/ are changed to high tone.

The second example involves the lexical items ‘gave’, ‘boy’ and ‘chicken’, of which the underlying forms are given in (194) and (195).

- (194) /moanáké/ ‘boy’  
 /kayokó/ ‘chicken’
- (195) a-hε-íré-<sup>!</sup>  
 SP-give-PST.CP-TDOWN  
 ‘gave’

In the sentence ‘someone gave the boy a chicken this morning’, the floating low tone cannot attach to the following NP /moanáké/, as this element ends on a high tone. Instead, the floating low tone appears after the two initial low-toned syllables /kayo/ of the next NP:<sup>42</sup>

40. The representation of tones follows Clements et al. (1983): [ ‘ ] = high tone, [ ] = low tone, [ ‘ ‘ ] = extra low tone, [ ‘ ] = rising tone, [ ‘ ] = falling tone.

41. The downstep appearing within the matrix verb is lexically determined. All nouns are actually prefixed with a class marker, which is not subanalysed in the examples. An overview of Kikuyu noun classes and their nominal and verbal agreement markers can be found in (Mugane 1997:25f.).

42. The downstep appearing with /ro:cí:ně<sup>!</sup>/ is lexically determined.

- (196) mondo<sup>1</sup> a-he-íré                      moanáké káyó<sup>1</sup>kó ro:cí:né<sup>1</sup>  
 person SP-give-PST.CP boy              chicken this.morning  
 ‘Someone gave the boy a chicken this morning’ (Clements et al. 1983:7)

As a result, the syllables following the floating low tone are pronounced in a lower pitch register, and the low-toned syllables /káyó/, which precede the downstep, change to high tone. The following example illustrates the effect of the downstep on sentence-final tone.

- (197) mondo<sup>1</sup> ɔ:n-íré                      káyokó<sup>1</sup>  
 person SP.see-PST.CP chicken  
 ‘Someone saw the chicken’ (Clements et al. 1983:8)

Here the sentence-final lowering rule is blocked – the final high tone of ‘chicken’ is not lowered.

This tonal pattern is affected in the context of clause-bound and long relativisation, wh-movement and focusation (but not with topicalisation; Clements 1984a:43). In these contexts, the post-verbal tonal downstep is deleted. Consider the following example:

- (198) Nó-o<sub>i</sub>      Kámaú é:<sup>1</sup>r-íré                      Ka:náké [áte t<sub>i</sub> o-tɛm-íré              mote ]?  
 FOC-who Kamau SP.tell-PST.CP Kanake [that PP-cut-PST.CP tree ]  
 ‘Who did Kamau tell Kanake that cut the tree?’

The downstep deletion has two effects on the tonal pattern of the sentence. Firstly, the sequences following the position where the low tone is expected are not pronounced in a lower pitch register; secondly, the preceding *ate* is not influenced in its tonal pattern by the downstep.<sup>43</sup> The following data show what happens to the chicken example in the case of extraction:

- (199) a. nó-o<sub>i</sub>      t<sub>i</sub> o-he-íré                      moanáké káyokó ro:cínê  
 FOC-who PP-give-PST.CP boy              chicken this.morning  
 ‘Who gave the boy a chicken this morning?’ (Clements et al. 1983:8f.)  
 b. né-ke<sub>i</sub>      món<sup>1</sup>do<sup>1</sup> a-he-í<sup>1</sup>ré                      moanáké t<sub>i</sub> ro:cí:nê  
 FOC-what person SP-give-PST.CP boy              this.morning  
 ‘What did someone give the boy this morning?’  
 c. [né káyokó karékó ]<sub>i</sub> món<sup>1</sup>do<sup>1</sup> a-he-í<sup>1</sup>ré                      moànàkè t<sub>i</sub>  
 [FOC chicken which ] person SP-give-PST.CP boy  
 ‘Which chicken did someone give the boy this morning?’  
 d. [né ré ]<sub>i</sub> món<sup>1</sup>do<sup>1</sup> a-he-í<sup>1</sup>ré                      moanáké káyòkò t<sub>i</sub>  
 [FOC when ] person SP-give-PST.CP boy              chicken  
 ‘When did someone give the boy a chicken?’

43. The initial high tone /á/ in /áte/ is due to high tone spread from the preceding high-toned /é/.



In (199a) and (199d), the downstep would have appeared after the sequence /kayo/, changing it to high tone; here, however, only the first syllable of /kayo/ appears with high tone. This is a sign that /kayo/ is affected by the preceding high-toned /moanáké/, but not by a following downstep. In (199c), the downstep would have floated to the sentence-final position and thus blocked the question intonation. Question intonation, however, does appear in the example (/moanáké/ > /moànáké/). In all examples, a downstep would have caused all elements following its expected position to be pronounced in a lower pitch register, which is not the case. This all indicates that the floating low tone is not present in the examples in (199).

There are more alternations in the context of extraction (Clements 1984a:39f.): Verbs display agreement with the external argument by a subject agreement marker. The regular marker for class 1 subjects is /a-/ (=‘subject prefix’). However, when a class 1 subject is extracted out of a predicate, then the subject agreement is expressed by a marker /o-/ (=‘pronominal prefix’). In addition, the verb also occurs in a different tonal form. This can be seen from examples (199a) vs. (199b). However, example (198) shows that the special verbal form appears only on the verb of whose domain the extraction takes place – the higher verb /é:’r-íré/ does not change in comparison to its occurrence in the declarative clause (193). I will therefore not count it as a reflex of successive-cyclic movement.

The downstep deletion, however, is indeed a “real” reflex of successive-cyclic movement: it appears on all predicates from which wh-extraction takes place; it does not take place when the wh-item is originally merged in the matrix clause. This is shown in (200).

- (200) nó-o<sub>i</sub>      Káma.ú a-ér-’íré      t<sub>i</sub> [áte Kariokĩ á’tém-íré      motě’<sup>1</sup> ]  
          FOC-who Kamu    SP-tell-PST.CP    [that Karioki PP-cut-PST.CP tree    ]  
          ‘Who<sub>i</sub> did Kamu tell t<sub>i</sub> that Karioki cut a tree?’

Neither is the floating low tone deleted when the wh-element stays in situ:

- (201) a. mondo’<sup>1</sup> a-he-íré      moanáké káyó’<sup>1</sup>kó kàrèkò  
          person SP-give-PST.CP boy      chicken which  
          ‘Which chicken did someone give to the boy?’      (synonymous with 199c)  
       b. mondo’<sup>1</sup> a-he-íré      moanáké káyó’<sup>1</sup>kò rè  
          person SP-give-PST.CP boy      chicken when  
          ‘When did someone give the boy a chicken?’      (synonymous with 199d)

That the downstep is present here can be seen from the preceding syllables /káyó/, which are both high-toned.

The wh-element can appear as the specifier of matrix and intermediate Cs. Here again, the downstep deletion appears only on the predicates from which the wh-item is extracted from:

- (202) a. **nó-o<sub>i</sub>**    ó-ɣw-eciiri-a                      [Ngóye a-úɣ-íre                      [áte    t<sub>i</sub>  
                  FOC-who SP-PST.CP-think-PST.CP [Ngugi SP-say-PST.CP [that  
                  o-On-íré                      Ka:nakε ]]  
                  PP-see-PST.CP Kanake    ]]
- b. ó-ɣw-<sup>l</sup> eciiri-á                      [**nó-o<sub>i</sub>**    Ngóye a-úɣ-íre                      [áte    t<sub>i</sub>  
                  SP-PST.CP-think-PST.CP [FOC-who Ngugi SP-say-PST.CP [that  
                  o-On-íré                      Ka:nakε ]]  
                  PP-see-PST.CP Kanake    ]]
- c. ó-ɣw-<sup>l</sup> eciiri-a                      [Ngóye a-úɣ-íré                      [ate    **nó-o<sub>i</sub>**    (t<sub>i</sub>)  
                  SP-PST.CP-think-PST.CP [Ngugi SP-say-PST.CP [that FOC-who  
                  o-On-íré                      Ka:nakε ]]  
                  PP-see-PST.CP Kanake    ]]
- a.-c. ‘Who do you think Ngugi said saw Kanake?’                      (Clements 1984a:47)

In (202c), the pronominal marker /o-/ appears on the verb, and the downstep is deleted (otherwise, the sentence-final lowering rule would be blocked, so that ‘Kanake’ would appear as /ka:náké/). This suggests that this example does not involve wh-in-situ; rather, the wh-element is extracted to the I or C domain. Note the contrast between (201) and (202c): When the subject is questioned, then the downstep is deleted; when, however, a non-subject is questioned, then the downstep is present.

#### 4.3.2.2 Analysis

I analyse the deletion of the floating low tone as a reflex of movement to the edge. The basic idea of the analysis is that in Kikuyu, movement to the edge is triggered by an inserted edge property. The edge property is assigned to a feature [X], which is then deleted after the successful extraction. As a result, the floating low tone, which is specified for [X], cannot be inserted anymore now.

The first question is: What is the feature specification of the floating low tone? This question can be answered if we consider again the contexts where the downstep occurs: with all, and only with, verbs in affirmative main clauses in which no wh-movement, focusation or relativisation has taken place (Clements 1984b:317). I would like to propose that the downstep is a polarity marker specified for [+affirmative] (cp. Clements 1984b:328).

- (203) *Morpho-syntactic specification of the floating low tone*  
                  /<sup>l</sup>/ ↔ [pol:+aff]

All clauses are specified for polarity, either with a negative value (e.g., negated clauses, conditionals), or as [pol:+aff] (all affirmative clauses; questions, relative clauses and focus clauses are underlyingly [+affirmative], too). I propose that edge property insertion targets the [pol:+aff]-feature.

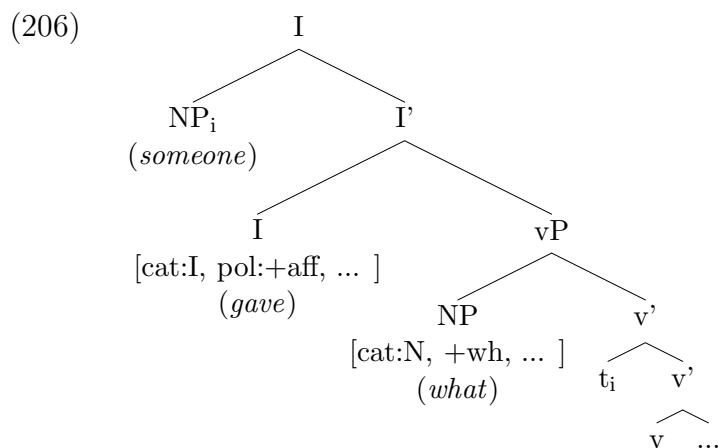
- (204) *Edge property insertion rule:*  
                  [pol+aff] > [•pol:+aff•]

On which head does the deletion of [pol:+aff] take place? I assume, following e.g. Laka (1990), Zanuttini (1997), and contrary to e.g. Koizumi (1995), that information on polarity is located below the C domain; [pol:±aff] is thus a feature of I. Edge property insertion takes place whenever the system encounters a matching feature; (204) therefore applies on I.

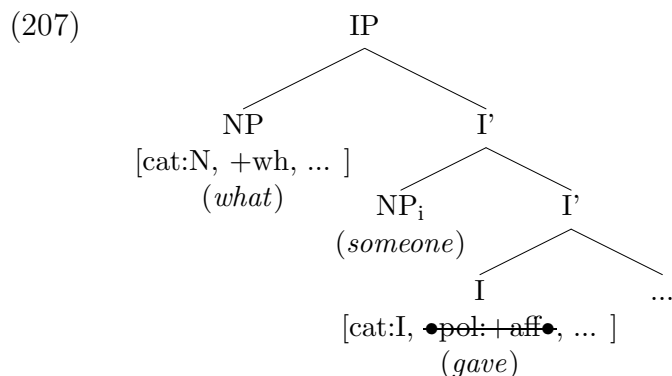
Let me illustrate the analysis by means of example (199b), which I repeat here as (205).

- (205) né-ke<sub>i</sub>      món-do<sup>1</sup> a-he-í-ré      moanáké t<sub>i</sub> ro:cí:nê  
 FOC-what person SP-give-PST.CP boy      this.morning  
 ‘What did someone give the boy this morning?’

There is a point in the derivation when the I phase is valued. The structure that Phase Balance operates on is shown in (206).



The system detects that there is a [●wh●]-feature in the numeration, but no potentially available corresponding [wh]-feature. The wh-phrase at the edge of v must thus be moved to the edge of I. As the ECOM is assumed to be prioritised over the IC in Kikuyu, the edge property is inserted to balance the phase. It is fused with the polarity feature. Now the wh-phrase is moved to the edge of I, the newly created edge feature is deleted, and the vP is Transferred. The result is shown in (207).

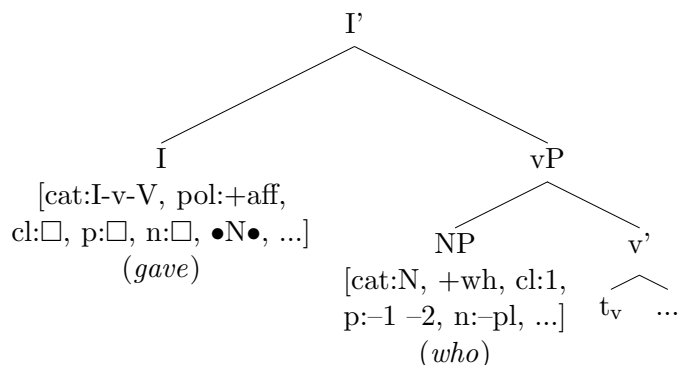


A vocabulary insertion, any item specified for [pol:+aff], including the floating low tone, cannot be inserted anymore.

This analysis derives all cases of object and v/VP adjunct extraction, as well as the downstep deletion on the matrix verb with long subject extraction. There is one case that is not accounted for so far: downstep deletion with subject questions when the subject does not leave the clause (examples 199a and 202c). The problem is that the subject wh-phrase is at no point of the derivation last-resort moved: Kikuyu is an SVO language, and the observation that tense, aspect and negation markers appear as verbal morphology strongly suggests that the verb is moved to I. This in turn means that I is merged with an EPP feature which attracts the external argument to the edge of I. When, in a simple clause, the external argument bears a wh-feature, then its probe, the C head, always finds NP<sub>ext</sub> in its search space. The new analysis predicts that downstep deletion should not take place then, which is obviously wrong. In what follows, I am proposing a new solution for this case.

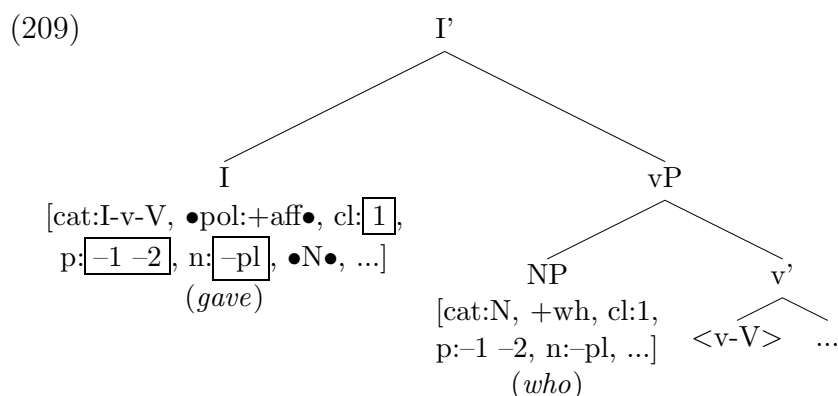
The basic idea of the new analysis is the following: When discussing points of variation in section 4.2.3.5, I mentioned a “third source of variation” that yields syntactic reflexes of successive-cyclic movement. This variation concerns the points in the derivation when Phase Balance applies. It has been assumed so far that Phase Balance is the last or last-but-one operation before a phase is completed (Heck and Müller 2006, Müller 2008c). I assume, however, that variation in the order of operation application does not only arise between Merge and Value (see the discussion in section 2.2.2), but also as to when Phase Balance applies. In the new analysis, tonal downstep deletion in simple subject questions is a reflex of a phase being balanced before any specifier is merged. In other words, the order of operation application is not {VALUE, MERGE}  $\gg$  PB, but either PB  $\gg$  {VALUE, MERGE} or VALUE  $\gg$  PB  $\gg$  MERGE. The decisive stage of the derivation is shown in (208).

(208) Num: {C<sub>[●wh●]</sub>, ... }

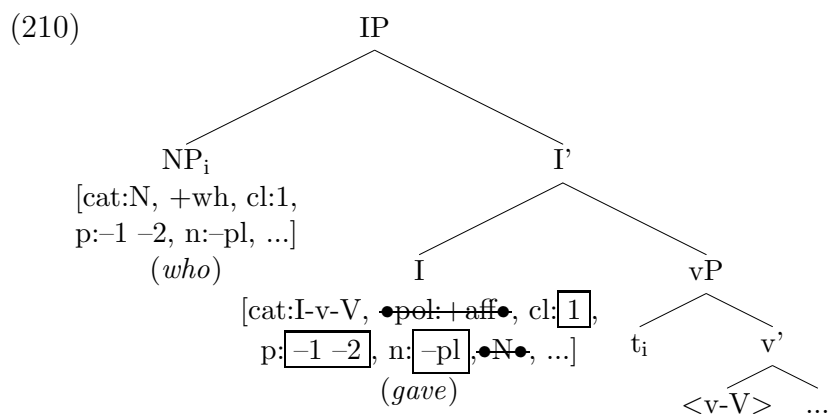


Now PB applies, reporting back that there is a [●wh●]-feature in the numeration, but no corresponding feature potentially available. NP<sub>[wh]</sub> must therefore be moved to the edge of I. To this end, the edge property is assigned to I, fusing with the polarity feature.

Up to now, we encountered only cases where PB is the last operation before the phase is completed – there were no other unsatisfied features left on the probe when the edge property was inserted, so that the edge feature was dealt with immediately. Now, however, the edge property is inserted into a feature set that still contains unsatisfied features. Crucially, the edge feature, once created, is a simple feature of I, with no right for priority. This means that once the edge feature is created, the derivation proceeds in a regular fashion: If the order of application is PB  $\gg$  VALUE  $\gg$  MERGE, then I values its unvalued features next. In other words, there is a delay between PB and the actual using of the edge feature: though PB has priority over other operations, the newly created edge feature can be dealt with at a later point. (209) shows the point of the derivation when Phase Balance has applied and Value has taken place.



Now the structure-building features are dealt with. Both target the same constituent: the wh-subject. I assume that one of them, either the EPP feature or the edge feature, applies regularly, and the remaining Attract feature then simply applies vacuously. This yields (210).



At vocabulary insertion, the floating low tone cannot be inserted anymore, as it is specified for [pol:+aff].

The question is now: Is the wh-subject in situ or not? Clements et al. (1983) take the downstep deletion with subject questions as an argument in favour of the view that the wh-subject is not in situ, but string-vacuously moved from the edge of I to the edge of C. In the new analysis, the tonal downstep is deleted on I whenever PB finds a [•wh•]-feature in the numeration and a wh-phrase at the edge of v,

even if the *wh*-phrase would be moved to the edge of *I* anyway. This means that the *wh*-subject in (199a) and (202c) *can* be in situ, after all (though it does not need to be – this depends on the decision if the NP is pied-piped to the edge of *C*, or if only the *wh*-feature is moved). In this analysis, *wh*-subject extraction and *wh*-subject-in-situ are phonologically not distinguishable in a simple clause: in both cases, the insertion of the floating low tone is blocked.

The new analysis has two advantages: Firstly, it removes the seeming asymmetry that *vP*-internal *wh*-elements can be left in situ, whereas a *wh*-subject must be extracted. Secondly, example (202c), where the *wh*-subject appears below the complementiser, can now be accounted for without assuming an additional head between *C* and *I* (Schwarz 2003:68), or morphology sensitive to clause edges (Lahne 2007b): Here, the *wh*-subject stays at the edge of *I*.

### 4.3.3 A Note on Participle Agreement in Literary French

In French perfect structures, the past participle does not agree with the direct object when the perfect is formed with *have* (see 211a). However, when the direct object is a weak pronoun that cliticises to the auxiliary, or when the direct object is relativised, then the participle agrees with it in number and gender (Kayne 1989):

- (211) a. Jean a repeint les chaise-s  
           Jean has repainted the chair(F)-PL  
       b. [Les chaise-s ]<sub>i</sub> que Jean a repeint-e-s t<sub>i</sub>  
           [the chair(F)-PL ] REL Jean has repainted-F-PL  
           ‘The chairs that Jean has repainted’

At first sight, this seems to be a reflex of successive-cyclic movement which runs counter to the generalisation on movement-induced exponence (definition 87 on page 60) in that it does not seem to be impoverishment, but rather enrichment. However, the reflex only shows up on the local past participle of the extracted object. Long movement of the direct object does not trigger any morphological reflex on higher participles:

- (212) [Les chaise-s ]<sub>i</sub> que Marie a pensé(\*-e-s) que Jean a  
           [the chair(F)-PL ] that Marie has thought(\*-F-PL) that Jean has  
           repeint-e-s t<sub>i</sub>  
           repainted-F-PL  
           ‘The chairs that Marie thought that Jean has repainted’

In addition, participle agreement only happens with relativisation and cliticisation, but not with *wh*-movement:

- (213) [Qu=est-ce ]<sub>i</sub> que Jean a repeint(\*-e-s) t<sub>i</sub>  
           [what=is-it ] REL Jean has repainted-(\*-F-PL)  
           ‘What has Jean repainted?’

It seems therefore reasonable to conclude that the participle agreement is not a reflex of successive-cyclic movement. A possible analysis is that participle agreement

is a doubling of morphology that emerges as the participle agrees with the direct object in gender and number; overt agreement is however blocked when vocabulary insertion finds the direct object in a local relation with the participle (this would account for the observation that there is no overt agreement with *wh*-elements, as these are underspecified with regard to number and gender).

#### 4.4 Summary: Morphological Evidence for Phase Edges

This section mainly aimed at analysing how particular reflexes of successive-cyclic movement emerge, leaning on the evidence from the previous chapter that C, I and v are phase heads. There is, however, one new piece of evidence, this time for V as a phase head: derivational nominalisation in Chamorro.

The evidence suggested that nominalisation along the path of successive-cyclic movement in Chamorro happens at VP stage. The nominalisation is derived by the deletion of the categorial feature of V in the context of successive-cyclic movement to the edge of V. Instead, the categorial feature of the moved element is copied onto V.



# Chapter 5

## Syntactic Reflexes

This chapter examines three types of syntactic reflexes of successive-cyclic movement: copying and partial movement reflexes (section 5.1), head movement reflexes (5.2), and extraposition reflexes (5.3). While the first type is merely examined in the light of evidence for phase edges, I put forth analyses for the latter two types within the framework of the new theory.

### 5.1 Copying and Partial Movement Reflexes

In what follows, I am examining reflexes of successive-cyclic movement that manifest themselves in copies or parts of the moved element that are left behind at intermediate positions. The goal of this subsection is to determine these positions, as they can be taken to be evidence for the location of phase edges.

#### 5.1.1 Quantifier Floating

In West Ulster English, *wh*-phrases containing a quantifier can “launch forward” the *wh*-operator from an intermediate position (McCloskey 2000). First consider (214a) and (215a), which show that the quantifier can be pied-piped with the *wh*-operator. (214b) and (215b) then show that the quantifier can be stranded when the *wh*-item is extracted. The crucial observation is example (215c): the quantifier can also be stranded in an intermediate position. This strongly suggests that at first the whole *wh*-phrase [what all] is internally merged at an intermediate phrase edge, and then the *wh*-operator is moved further on, without pied-piping the quantifier.

- (214) a. [What all]<sub>i</sub> did you get *t<sub>i</sub>* for Christmas?  
b. What<sub>i</sub> did you get [*t<sub>i</sub>* all] for Christmas?
- (215) a. [What all]<sub>i</sub> did he say (that) he wanted *t<sub>i</sub>*?  
b. What<sub>i</sub> did he say (that) he wanted [*t<sub>i</sub>* all]?  
c. What<sub>i</sub> did he say [*t<sub>i</sub>* all]<sub>j</sub> (that) he wanted *t<sub>j</sub>*?

As can be seen from (215c), the stranded quantifier appears before the complementiser. Given that the derivation proceeds indeed in such a way that the *wh*-phrase

is first moved and the partially stranded, this is evidence in favour of the edge of C as an intermediate landing site and thus a phase edge. The quantifier cannot be located at the edge of matrix V or *v*, as it would then be linearised to appear either before the matrix verb or after the embedded CP.

### 5.1.2 Wh-Copying and Partial Wh-Movement

Partial wh-movement, the stranding of a wh-phrase in an intermediate SpecC position, has been reported for many languages, e.g. German (Müller 1999), Frisian, Afrikaans, Romani (Felser 2004, McDaniel 1989), Iraqi Arabic (Wahba 1992), Hungarian (Horvath 1997), Ancash Quechua (Cole 1982), and Passamaquoddy (Bruening 2006). In most cases, there is a less specific wh-operator that appears at the left edge of the matrix clause. Some examples are given in (216) to (219).

- (216) Was glaubst du [wen sie getroffen hat ]?  
 what believe:2SG you [whom she met has ]  
 ‘Who do you believe she has met?’ (German)
- (217) Was glabs=de [wär de Kwärwlsob geass wöll ]?  
 what believe:2SG=you [who the Kwärwl.soup eat want:3SG ]  
 ‘Who do you think wants to eat the Kwärwl soup?’ (German/Ilmenau)
- (218) So o Demìri mislinol [kas i Arifa dikhla ]?  
 what Demir think:3SG [whom Arifa saw ]  
 ‘what does Demir think whom Arifa saw?’ (Romani, McDaniel 1989:569)
- (219) Keq kt-itom-ups [tayuwe apc k-tol-i malsanikuwam-ok ]?  
 what 2-say-DUB [when again 2-there-go store-LOC ]  
 ‘When did you say you’re going to go to the store?’  
 (Passamaquoddy, Bruening 2006:26)

In constituent questions in Ancash Quechua, the wh-element can be pronounced in situ or at the left edge of the clause, as shown in (220). The observation that the internal argument in (220a) appears in the same location as the wh-phrase in (220b) can be taken to be evidence that in (220b), the wh-element is in situ (Cole 1982). Cole notes that (220b) and (220c) are entirely synonymous.

- (220) a. María José-wan parlan  
 María José-with speaks  
 ‘María is speaking with José’ (Cole 1982)
- b. María pi-wan-taq parlan?  
 María who-with-INT speaks  
 ‘Who is María speaking with?’
- c. Pi-wan-taq María parlan?  
 who-with-INT María speaks  
 ‘Who is María speaking with?’

Now consider the more complex examples in (221). Again, the *wh*-element can appear in situ and at the left edge of the matrix clause, but also at the edge of the embedded clause:

- (221) a. José munan [María may-man aywa-na-n-ta ]?  
           José wants [María where-to go-NMLZ-3-ACC ]  
       b. José munan [may-man<sub>i</sub> María t<sub>i</sub> aywa-na-n-t ]?  
           José wants [where-to María go-NMLZ-3-ACC ]  
       c. May-man-taq<sub>i</sub> José munan [t<sub>i</sub> María t<sub>i</sub> aywa-na-n-ta ]?  
           where-to-inter José wants [ María go-NMLZ-3-ACC ]  
       a-c: ‘Where does José want María to go?’

A possible analysis is indicated in example (221c): *wh*-movement in Ancash Quechua always proceeds successive-cyclically to the left edge of the matrix clause, but a lower copy can be pronounced. The occurrence of the *wh*-element at different locations in the clause is thus reduced to a mere PF-phenomenon with no semantic impact. Indeed, as Cole, points out, all examples in (221) are entirely synonymous and freely varying. The only restriction to the pronunciation of copies is that the *wh*-form cannot appear in a non-peripheral position in the intermediate clause:

- (222) \* (Quam) kreinki [María ima-ta<sub>i</sub> muna-nqa-n-ta [José t<sub>i</sub>  
           (you) believe [María what-ACC want-NMLZ-3-ACC [José  
           ranti-na-n-ta ]]?  
           buy-NOMLZ-3-ACC ]]  
       ‘What do you believe María wants José to buy?’

Some languages allow for the pronunciation of two identical copies of a *wh*-element in different positions in the clause. The following examples are from German (Müller 1999, Fanselow and Mahajan 2000, Felser 2004), Afrikaans, Frisian and Romani.

- (223) Wem glaubst du [wem sie geholfen hat ]?  
       whom.DAT believe.2SG you [whom.DAT she helped has ]  
       ‘Whom do you believe did she help?’ (German; acceptable for some speakers)  
       (224) Wêr tinke jo [wêr=t Jan wennet ]?  
           where think you [where=that Jan resides ]  
           ‘Where do you think that Jan lives?’ (Frisian, Hiemstra 1986:99)  
       (225) Waarvoor dink julle [waarvoor werk ons ]?  
           wherefore think you [wherefore work we ]  
           ‘What do you think we are working for?’ (Afrikaans, du Plessis 1977:725)  
       (226) Kas o Demiri mislenola [kas i Arifa dikhlã ]?  
           whom Demir think [whom Arifa saw ]  
           ‘Whom does Demir think.3SG whom Arifa saw?’ (Romani, McDaniel 1989:569)

The same phenomenon is reported from child language, as exemplified in (227) to (230) with data from English, Dutch, Spanish and Basque.

- (227) a. What do you think [what's in the box ]?  
 b. Who do you think [who's under there ]?  
 c. How do you think [how the witch went over to the hot-dog ]?  
 d. When do you think [when the girl crossed the street ]? (Thornton 1995)
- (228) Hoe denk je [hoe ik dat doe ]?  
 how think you [how I that do ]  
 'How do you think I do that?' (Dutch, van Kampen 1997)
- (229) ?/√ Dónde crees [dónde ha ido el niño ]?  
 where think.2SG [where has gone the child ]  
 'Where do you think the child has gone?' (Spanish, Gutierrez 2006)
- (230) Nor uste duzu [nor bizi dela etxe horretan ]?  
 who think AUX [who lives AUX.COMP house that.LOC ]  
 'Who do you think lives in that house?' (Basque, Gutierrez 2006)

These examples can be taken to be evidence for successive-cyclic movement, given that they involve spell-out of copies left behind (but see e.g. Horvath (1997) for a different view on Hungarian). In all cases, the lower copy appears above the subject, which means that it is located either at the edge of I or the edge of C. The Frisian and Spanish examples strongly suggest that the *wh*-copy is at the edge of C: in Frisian, it appears above the complementiser, which is cliticised to it. The Spanish example (229) shows verb inversion, which means that the verb is located in C, and here the *wh*-copy appears above it.

## 5.2 Verb Movement

### 5.2.1 Data: Belfast English, French, European Spanish, Basque

Henry (1995:108f.) observes that in Belfast English, in contrast to Standard English, I-to-C movement can freely apply in embedded clauses, and applies in all clauses on the path between a *wh*-element and its base-merge site. This is illustrated in (231).

- (231) a. [What]<sub>i</sub> did Mary claim [ t<sub>i</sub> did [ they t steal t<sub>i</sub>]]?  
 b. [What]<sub>i</sub> did John say [ t<sub>i</sub> did Mary claim [ t<sub>i</sub> had John feared [ t<sub>i</sub> would [Bill t<sub>i</sub> attack t<sub>i</sub>]]]] ?

Inversion is not possible with a complementiser present:

- (232) a. What did Mary claim that they stole?  
 b. \*What did Mary claim that did they steal?

When verb inversion occurs, then it has to appear consistently between the base merge site of the *wh*-element and its final landing site. (233) shows that the inversion does not appear in a clause lower than that from which the *wh*-element is extracted:

- (233) a. \* Who do you think did John convince did Mary go?  
 b. Who do you think did John convince that Mary went?

A similar phenomenon can be observed in French (Kayne and Pollock 1978): In this language, verb inversion (=‘stylistic inversion’) cannot take place freely (as shown in the contrast between 234a and 234b), but it is triggered by the fronting of a *wh*-element, as shown in (234c). When long movement takes place, then verb and subject are inverted in all clauses on the path of the *wh*-item (see 234d); if the *wh*-element originates from a higher clause, then the lower clause is not affected by inversion (example 234e).

- (234) a. Jean est parti  
           Jean is left  
           ‘Jean has left’  
 b. \* Est parti Jean  
       is left Jean  
 c. Où est allé Jean?  
       where is gone Jean  
       ‘Where did Jean go?’  
 d. Où crois=tu qu’=est allé Jean?  
       where believe=you that=is gone Jean  
       ‘Where do you believe that Jean went?’  
 e. \* Qui croit qu’=est parti Jean?  
       who believes that=is left Jean  
       ‘Who believes that Jean left?’

The inversion phenomenon also shows up in European Spanish (Torrego 1984). Spanish is an SVO language, but when a *wh*-phrase appears in SpecC, then the subject does not intervene between the *wh*-operator and the verb:

- (235) a. Qué querían esos dos?  
           what wanted:3PL those two  
           ‘What did those two want?’ (Torrego 1984:103)  
 b. \* Qué esos dos querían?  
       what those two wanted:3PL  
 (236) a. Con quién vendrá Juan hoy?  
           with whom comes.FUT:3SG Juan today  
           ‘Whith whom will Juan come today?’  
 b. \* Con quién Juan vendrá hoy?  
       with whom Juan comes.FUT:3SG today

The inversion is triggered in each clause the *wh*-element passes:

- (237) a. Juan pensaba que Pedro le había dicho que la revista había  
 Juan thought that Pedro him had told that the journal had  
 publicado ya el artículo  
 published already the article  
 ‘Juan thought that Pedro had told him that the journal had already published the article’
- b. Qué pensaba Juan que le había dicho Pedro que había publicado  
 what thought Juan that him had told Pedro that had published  
 la revista?  
 the journal  
 ‘What did Juan think that Pedro had told him that the journal had published?’
- c. \* Qué pensaba Juan que Pedro le había dicho que la revista había publicado?

That the inversion is indeed linked to the movement of the wh-phrase is strongly suggested by the following example: Verb and subject do not invert when the proposed wh-phrase originates from the matrix clause.

- (238) A quién prometió Juan que Pedro se encargaría de que la gente  
 to whom promised Juan that Pedro himself take charge of that the people  
 sacara las entradas a tiempo?  
 buy.fut the tickets on time  
 ‘To who did John promise that Peter would be in charge of the people buying their tickets on time?’ (Torrego 1984:110)

However, verb inversion in Spanish is not entirely insensitive to the kind of extracted element: It appears in clauses where C has a wh-specifier or where a certain type of wh-movement or focus movement has taken place from that CP (Torrego 1984, Baković 1998, Fanselow 2002). However, it does not occur when the wh-element is *en qué medida* ‘in what way’, *por qué* ‘why’, *cuándo* ‘when’ and *cómo* ‘how’, among others, and with the complementiser *si* ‘whether’ (Torrego 1984:106).

There are a number of analyses dealing with these data (e.g., Rizzi and Roberts 1989, Rizzi 1990, Henry 1995, among many others). The difficulty any analysis is facing is the look-ahead problem: I-to-C movement must take place before C merges a specifier, as any other order of application would yield a violation of the Strict Cycle Condition. However, at the point when I-to-C movement can take place, an intermediate C head does not “know” yet if it merges a wh-element as a specifier in a later step or not.

The analyses generally agree that the inversion is caused by the wh-operator being moved to intermediate positions between extraction site and final landing site. A second point of wide agreement (but see Fender 2002) is that verb inversion in Belfast English is V-to-C movement. The evidence for this analysis is that the

verb is in complementary distribution with the complementiser:

- (239) a. \* John asked Mary [<sub>CP</sub> whether/if was she going to the lecture]  
 b. \* I wondered [<sub>CP</sub> which dish that did they pick]

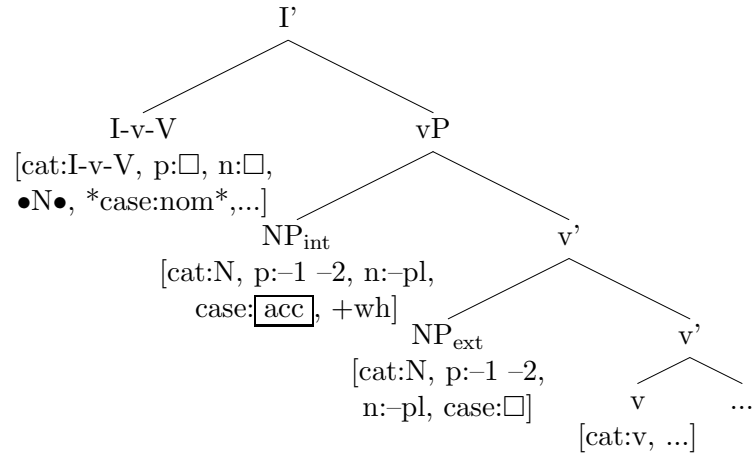
Henry (1995) proposes the following analysis: When a wh-item is moved across a C head, then this head agrees with the wh-element and thus becomes [+wh]. In Belfast English, the wh-agreement takes place in the syntax. In addition, there are two possible versions of non-root C in this variety. One possibility is to merge a phonologically null, affix-like wh-complementiser (see Rizzi and Roberts 1989). This element attracts the verb. The other possibility is an overt, non-affix-like C head, which surfaces e.g. as *that*, and which blocks V-to-I movement. Consequently, the passing wh-element triggers overt V-to-C movement in Belfast English. In Standard English, on the other hand, the agreement between a C head and a crossing wh-item happens at LF, and the phonologically null complementiser is only available for root C, which is [+wh] by itself. This has the effect that syntactic V-to-C movement is always blocked in embedded clauses. The verb is, however, raised in matrix clauses, as matrix C<sub>[+wh]</sub> agrees with the wh-element in the syntax, and the zero wh-complementiser attracts the verb to C.

### 5.2.2 Analysis

When examining downstep deletion in Kikuyu, I introduced a point of variation that concerns the timing of Phase Balance. The idea was that variation in the order of operation application arises between Merge, Value and Phase Balance. In the new analysis, head movement in the context of successive-cyclic movement is a reflex of a phase being balanced before any specifier is merged. In other words, the order of operation application is PB ≫ Value ≫ Merge.

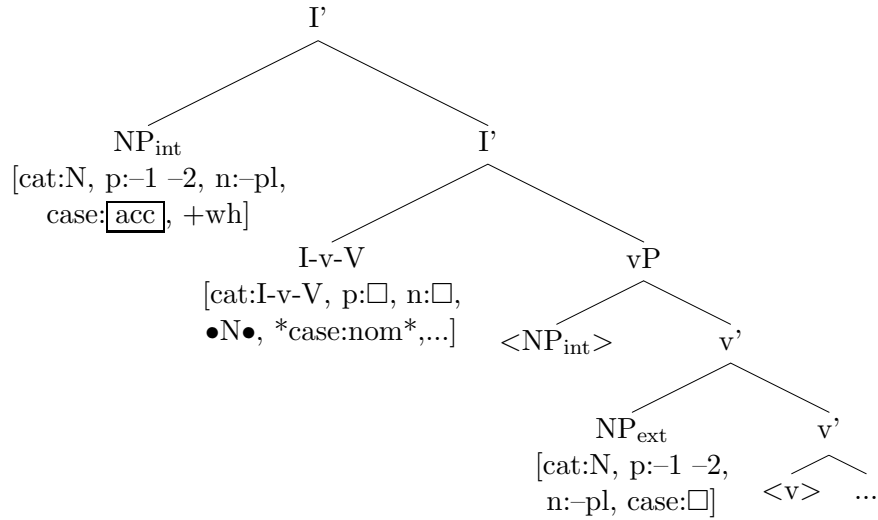
In Belfast English, French and European Spanish, the feature set of I contains unvalued  $\phi$ -features which are valued by those of the external argument. In the derivation of a declarative clause, the external argument is moved to the edge of I. The new analysis steps in when I is merged. In the following, I am going through an abstract example which applies to all three languages in question. In the example, the internal argument carries the [+wh]-feature. It is located at the edge of v, just like the external argument, and V-to-I movement has taken place. This stage is shown in (240).

(240)



Now phase balance applies first, with the result that the *wh*-element is extracted to the edge of *I* (there is no evidence that the feature set of *I* is impoverished, so movement to the edge here is assumed to proceed as a non-feature-driven operation):

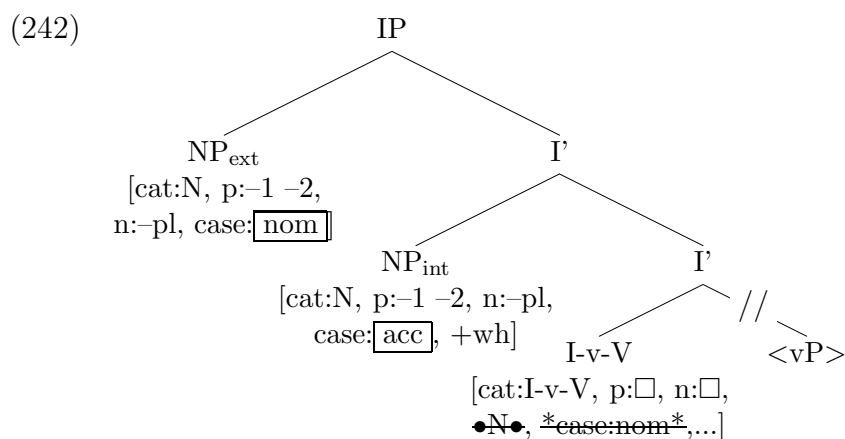
(241)



The next steps would be that *I* values its  $\phi$ -features and assigns nominative case. However, the valuing of  $\phi$ -features is disallowed now, as it would violate the Strict Cycle Condition: The valuing of *I*'s features is a rule application that affects only a subdomain of the current tree (see page 12). Moreover,  $NP_{int}$  acts as an intervener for case assignment, as it is closer to *I* than  $NP_{ext}$  is, and bears a case feature, too.<sup>44</sup> The only operation *I* can trigger at this point is to extend the tree by attracting  $NP_{ext}$  to its edge. Now both NPs are equidistant, and *I* can assign nominative case to  $NP_{ext}$ , but the valuing of its  $\phi$ -features is still impossible. This stage is shown in (241).

44. This follows from the definitions of Agree and Path in (24) and (23) on page 21.





I cannot trigger any further operation at this point, though it still has unvalued features. The system however does not break down at this point. Instead, C is merged, and I is moved to C as a last resort. Now the feature set of I can value its  $\phi$ -features.

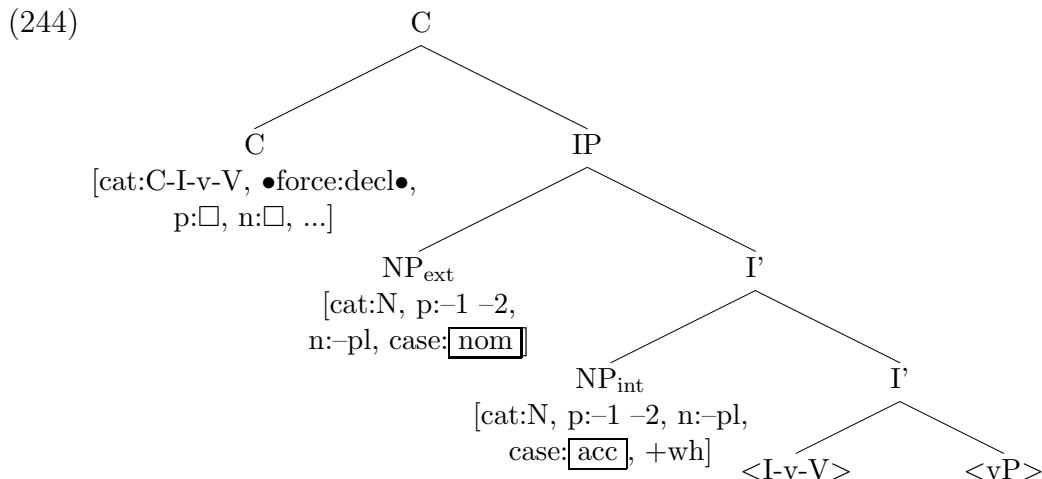
I would like to propose the following modelling of I-to-C movement: The verb movement is yielded by a violation of the Inclusiveness Condition, i.e., by assigning the edge property to a feature of C. The feature this property is fused with is the clause type feature, no matter which value it has (i.e., [force: $\pm$ decl]). [ $\bullet$ force $\bullet$ ] thus attracts the verb, and is then deleted alongside with the edge property. The C head is now impoverished. This blocks the insertion of *that* or any other complementiser whenever verb raising takes place, as these items are specified for clause type.

There are two questions that come up at this point: Firstly, why is wh-movement to the edge of I non-feature-driven, whereas V-to-I movement is yielded by edge property insertion? Secondly, if the I phase is balanced before I values its  $\phi$ -features, why is Phase Balance delayed for the C phase, so that C-I-v-V can value its  $\phi$ -features before a specifier is merged? To answer these questions, let us have a closer look at the mechanism that drives successive-cyclic movement in the languages in question. I assume that in Belfast English, French and European Spanish, the Economy Condition on Merge is higher-ranked than the Inclusiveness Condition. There is one edge property insertion rule for English, which is defined for C:

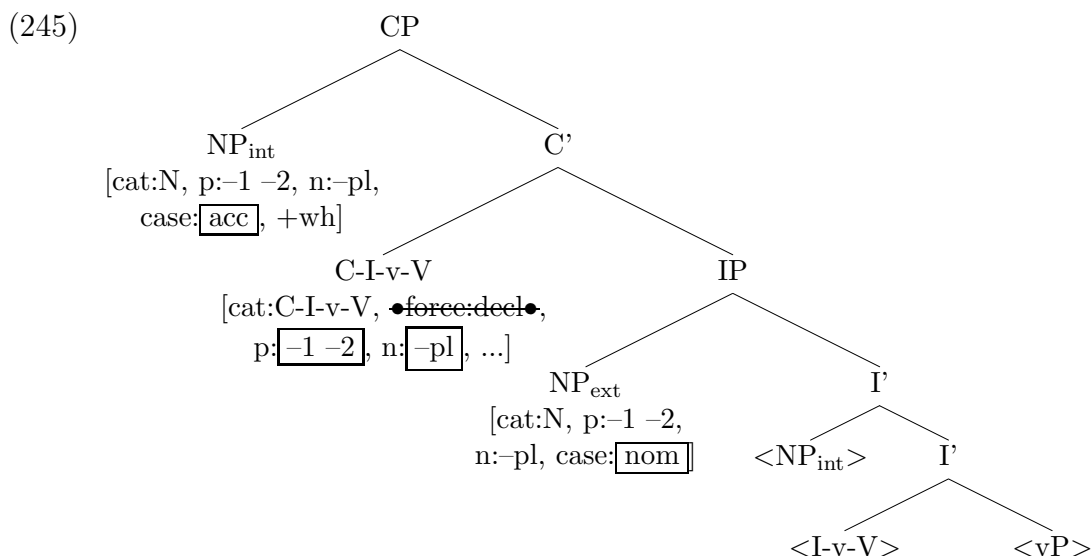
(243) *Edge property insertion rule:*  
 [force] > [ $\bullet$ force $\bullet$ ] / \_\_\_ [cat:I]

The idea is that although ECOM is higher-ranked than the IC, it can nevertheless be violated in the course of movement to the edge if there is no way of inserting the edge property, i.e., if no insertion rule is defined for a given head. Again, the assumption is that there is only one insertion rule in English, which applies to the C head. That means that in both Standard and Belfast English, movement to the edge of C proceeds via edge property insertion, whereas movement to the edge of I, v, V etc. is non-feature-driven. That answers the first question. As to the second question, there is no difference in the timing of PB itself – PB always happens first. The seeming delay is actually a delay in satisfying the edge feature: Wherever movement to the edge is non-feature-driven, then it happens as

soon as PB has detected the necessity of moving an element to the edge. When, however, the edge property is assigned to a feature set in which there are still unvalued features, then the derivation proceeds in a “regular fashion”; i.e., the newly created edge feature has no priority over the other features in the set. The derivation as it is after PB has taken place is shown in (244).



After PB, C has three features that are not dealt with yet: the person and number features, which have to be valued, and the edge feature. Crucially, the unvalued features are dealt with before the edge feature is satisfied. There are two explanations for this: Firstly, it was said in the analyses of accusative/ergative patterns and Mahajan’s Generalisation (discussed in section 2.2.2) that in accusative languages, the order of operations is Value  $\gg$  Merge. Thus, for reasons of consistency, the unvalued features should be dealt with first in this case, too. Secondly, if the derivation is driven by specificity, as argued for in Lahne (2007*c*, 2008*b*), then the operation involving the handling of the person and number features has priority over the operation that involves handling of a the single Attract feature. The derivation then finally looks as shown in (245).



The derivation yields almost the same resulting structure when C is the final landing site for the *wh*-item, the only difference being that C additionally bears

a [+wh]-feature. Here too, the unvalued features are dealt with before C's wh-specifier is merged, for the same reasons as already mentioned.

The new analysis accounts for the verb inversion cases, but there is a point that still has to be discussed: In the two varieties of English examined, verb inversion must take place in the matrix clause. In embedded clauses, verb inversion never takes place in Standard English. In Belfast English, on the other hand, verb inversion and the complementiser are in complementary distribution, though within one derivation, the choice must be consistent: when verb inversion happens in the context of movement, then it must affect each C head the moved element passes. This different behaviour can be accounted for by assuming that in both varieties of English, Phase Balance happens before Value in matrix contexts (i.e., the order of operation application is 'PB  $\gg$  Value  $\gg$  Merge'). In non-root contexts, the varieties differ: In Standard English, Phase Balance happens when the phase is nearly completed (i.e., 'Value  $\gg$  Merge  $\gg$  PB'). In Belfast English, both application orders are possible in non-root contexts; the order is, however, globally determined for a derivation, so that within one derivation, PB happens either always first in non-root clauses, or always last.

Let me clarify the analysis by going through the possible constellations. There are actually only two different cases. Case 1 was already illustrated in (240) to (245): PB always happens first, with the effect that the verb always moves to C. The verb movement in turn has the effect that the clause type feature is deleted, which means that no complementiser can be inserted. This happens in matrix clauses in both varieties, and in embedded clauses in Belfast English. In case 2, PB happens last, with the effect that the verb does not raise. Now the edge property cannot be inserted into C, as the rule for C is specified for the context [cat:I], which is not given when I-to-C movement does not take place. Consequently, the wh-element is moved to the edge of C in a non-feature-driven operation. Now C's feature set stays intact, so that a complementiser can be inserted. This happens in embedded clauses in Standard and Belfast English.

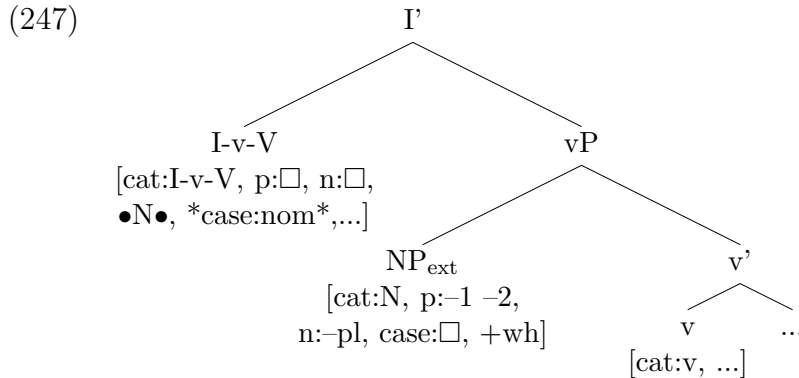
So far, nothing was said about the emergence of *do*-support in the context of wh-movement. The new analysis does indeed offer a new view on this phenomenon, given that there is general V-to-I movement in English. If this is so, then *do*-support can be accounted for by assuming that not the whole verb is pied-piped in the last-resort movement to C; rather, only the unvalued features are moved, and these pied-pipe only the inflectional features of the verbal head, while the lexical properties are left behind. Note that this analysis only works when v-to-I movement takes place for independent reasons (the early application of PB on v does not lead to a last-resort v-to-I raising, as v does not need to value any of its features with the feature set of the outer specifier).

It was said above that verb inversion consistently appears between the base merge site of the wh-element and its final landing site. That is not quite the whole picture. In fact, there is a subject-object asymmetry: When the external argument of an embedded clause is extracted, then inversion happens in the matrix clause, but

not in the clause the external argument originates from, as shown in (246).

- (246) a. Who did Mary claim (that) stole my car?  
 b. \*Who did Mary claim did steal my car?  
 c. Who did Mary claim had John feared (that) stole my car?

This behaviour can be straightforwardly accounted for in the new analysis. The starting point is similar to that illustrated in (240), with the difference that now  $\text{NP}_{\text{ext}}$  bears the  $[+wh]$ -feature, and that  $\text{NP}_{\text{int}}$  is already Transferred:



The I phase is balanced next, with the result that a situation emerges we have not encountered before: There is an element that must be internally merged at the edge of I, but I indeed has a feature that attracts exactly this element. Thus, neither the ECOM nor the IC need to be violated in the course of movement to the edge – the computation proceeds just like a declarative derivation: The  $\phi$ -features of I are valued, I assigns external case to  $\text{NP}_{\text{ext}}$  and internally merges it at its edge. As a result, I is not last-resort moved to C. In addition, the analysis correctly predicts that verb inversion can take place in intermediate clauses: As the passing subject is a different element than the subject of the intermediate clause, it is an intervener for agree between intermediate I and the intermediate subject when PB applies early.

## 5.3 Obligatory CP-Extrapolation

### 5.3.1 Data: German, Basque

In German and Basque, CP extraposition is optional with finite declarative CP complements (Ormazabal et al. 1994, Müller 1999:17):

- (248) a. dass er [dass Fritz Claudia liebt ] gesagt/ nicht gewusst  
 that he [that Fritz.NOM Claudia.ACC loves ] said/ not known  
 hat  
 has
- b. dass er  $t_i$  gesagt/ nicht gewusst hat [dass Fritz Claudia  
 that he said/ not known has [that Fritz.NOM Claudia.ACC  
 liebt ]<sub>i</sub>  
 loves ]  
 ‘that he said/didn’t know that Fritz loves Claudia’

- (249) a. Mirenek [Parisera joango zela ] esan zidan  
 Mary:ERG [Paris:to go AUX-C ] say AUX  
 ‘Mary told me that she was going to Paris’

- b. Mirenek  $t_i$  esan zidan [Parisera joango zela ]<sub>2</sub>  
 Mary:ERG say AUX [Paris:to go AUX-C ]  
 ‘Mary told me that she was going to Paris’

CP extraposition is optional, too, with finite [+wh] CP complements (Ortiz de Urbina 1989, Müller 1999):

- (250) a. ?dass er [wen<sub>i</sub> Fritz  $t_i$  liebt ] nicht gesagt/ gewusst hat  
 that he [who.ACC Fritz.NOM loves ] not said/ known has  
 ‘that he didn’t say/know who Fritz loves’
- b. dass er  $t_j$  nicht gesagt/ gewusst hat [wen<sub>i</sub> Fritz  $t_i$  liebt ]<sub>j</sub>  
 that he not said/ known has [who.ACC Fritz.NOM loves ]  
 ‘that he didn’t say/know who Fritz loves’

- (251) a. [Noiz etorri d-en ] galdetu dut  
 [when come AUX-en ] ask AUX  
 ‘I have asked when he has come’
- b. Ez  $t_i$  dakit [noiz etorri d-en herri honetara ]<sub>i</sub>  
 NEG know [when come AUX-SUB this town ]  
 ‘I don’t know when he has come to this town’

However, if wh-extraction takes place from a CP<sub>[-wh]</sub>, then that CP is obligatorily extraposed (Ormazabal et al. 1994, Müller 1999):

- (252) a. \*(Ich weiß nicht) wen<sub>i</sub> er [t<sub>i</sub> dass Fritz  $t_1$  liebt ] gesagt hat  
 (I know not) who.ACC he [ that Fritz.NOM loves ] said has  
 ‘I don’t know who he said that Fritz loves’
- b. (Ich weiß nicht) wen<sub>i</sub> er  $t_j$  gesagt hat [t<sub>i</sub> dass Fritz  $t_1$  liebt ]<sub>j</sub>  
 (I know not) who.ACC he said has [ that Fritz.NOM loves ]  
 ‘I don’t know who he said that Fritz loves’
- (253) a. \*Zer<sub>i</sub> esan dizute [t<sub>i</sub> irakurriko du-ela Peruk  $t_i$  ] entzun  
 what.ABS say AUX [ read AUX-COMP Peru:ERG ] hear  
 dutela ?  
 AUX-COMP  
 ‘What did they tell you that they heard that Peter will read?’
- b. Zer<sub>i</sub> esan dizute  $t_j$  entzun dute-la [t<sub>i</sub> irakurriko du-ela  
 what.ABS say AUX hear AUX-COMP [ read AUX-COMP  
 Peruk  $t_1$  ]<sub>j</sub> ?  
 Peru:ERG ]  
 ‘What did they tell you that they heard that Peter will read?’

### 5.3.2 Analysis

Müller (1999) analyses obligatory CP extraposition as a reflex of feature-driven successive-cyclic movement to the edge of an embedded CP. The triggering feature is the clause type feature  $[\pm wh]$ ; the checking requires identity of features, but not identity of feature values (“Imperfect Checking”). In the process of imperfect checking, both wh-features involved (that of the wh-phrase and that of C) are “strengthened” in a sense that they have to be checked by a further syntactic operation. In German and Basque, the  $[-wh]$ -feature is checked by extraposition of the embedded CP to the domain of the matrix predicate. As a consequence, whenever there is wh-movement to the edge of a  $CP_{[-wh]}$ , there is obligatory CP extraposition.

I would like to propose a new analysis in the framework of the new theory. The new account rests upon the observation that clauses with and without extraposition differ in their semantic properties: The examples involving extraposition are felicitous answers in both out-of-the-blue and narrow focus contexts, whereas the sentences without extraposition are only acceptable in narrow focus contexts. This is illustrated in (254) and (255).

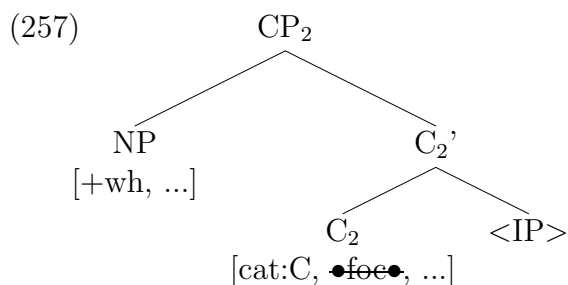
- (254) What happened? – He said...
- a. ... dass er [wen Fritz liebt] nicht gewusst hat
  - b. # ... dass er nicht gewusst hat [wen Fritz liebt]

- (255) What was it he didn’t know? – He said...
- a. ... dass er [wen Fritz liebt] nicht gewusst hat
  - b. ... dass er nicht gewusst hat [wen Fritz liebt]

There are three background assumptions. Firstly, CP extraposition is triggered by a feature which I refer to by the variable  $[\bullet\Sigma\bullet]$ . This feature belongs to I and is optional. Secondly, there is a linearisation rule according to which non-focused CPs (i.e., CPs without a feature [foc]) must be aligned to the very right. Thirdly, in contexts where I-to-C movement has not taken place, the edge property insertion into C targets the feature [foc] (compare to rule (243), which only jumps in when the verb is in C).

- (256) *Edge property insertion rule for C:*  
 $[foc] > [\bullet foc \bullet]$

(256) has the effect that any focus feature on C is deleted whenever an element is last-resort moved to C’s edge. The result is shown in (257).



When matrix I contains a  $[\bullet\Sigma\bullet]$ -feature, then the impoverished  $CP_2$  is internally merged as its specifier; the derivation converges, as the focus linearisation rule is obeyed. If matrix I is not merged with a  $[\bullet\Sigma\bullet]$ -feature, then  $CP_2$  stays in its position, and the derivation crashes at a later stage, as it does not obey the focus linearisation rule. There are cases where the embedded C has no [foc] feature to begin with. In these cases the CP must always be extraposed, no matter if long movement takes place or not. Here the movement to the edge of embedded C is non-feature driven. The same reasoning holds for the optionality in the cases not involving long movement (248 and 251): When the embedded CP bears a focus feature, then the derivation converges with both CP extraposition and CP-in-situ. When, on the other hand, the embedded CP does not bear a focus feature, then only those derivations converge in which I has a  $[\bullet\Sigma\bullet]$ -feature. The result is that CP extraposition looks optional at first sight, but it can be correlated with the semantic properties of the embedded CP: Focused CPs appear both in situ and extraposed; CPs that are not interpreted as focused are always extraposed.

## 5.4 Summary: Syntactic Evidence for Phase Edges

Given that copying and partial movement involve the pronunciation of intermediate copies, the examples discussed here provide evidence for the edge of C as a phase edge, and thus for C as a phase head. The new verb movement analysis, too, involves C as a phase, but also requires I to be phasal. Finally, obligatory CP extraposition as it is analysed here again suggests that C is a phase head.

The new accounts of movement-induced verb inversion and CP extraposition have the advantage that they rest upon the same underlying mechanism that triggers morphological reflexes of successive-cyclic movement: Intermediate merge of moved elements at intermediate phase edges triggers probe impoverishment. The phenomenon of verb inversion, however, is originally triggered by a second mechanism that interacts with probe impoverishment: Phase Balance happens early in each phase, so that the agreement between the verb in I and its argument is blocked. The derivation is then rescued by last-resort I-to-C movement, which again happens via edge property insertion, and results in impoverishment of the C probe.



# Chapter 6

## Summary, Consequences

In this work I examined the following reflexes of successive-cyclic movement:

- Semantic reflexes: reconstruction, ellipsis, reconstruction into elided material;
- Morphological reflexes: altering verbal morphology in the context of movement;
- Syntactic reflexes: copying, verb inversion and CP extraposition in the context of movement.

### 6.1 Goal 1: Phase Model

The first goal of this work was to diagnose for phase heads by means of these reflexes, and to propose a phase model on their basis. To this end, let me recapitulate on the conclusions from the previous chapters. The syntactic and semantic path phenomena provide evidence for the phase head status of C (CP reconstruction, copying, partial movement), I (binding of pronouns and anaphors, elliptic repair) and v (vP reconstruction, pair-list readings, pair-list-readings with sluiced islands). In addition, there is morphological evidence for V as a phase head (derivational nominalisation in Chamorro). If the analyses presented and developed here are on the right track, then these reflexes, taken together, are evidence in favour of the null hypothesis on phase size presented under (45) on page 33: Each phrase is a phase. Phases are thus not defined on semantic grounds, but by purely syntactic criteria: A phase is a portion of structure that best fulfills the requirement that the operation space of syntactic computations be as small as possible, and as big as necessary (=Complexity Reduction Requirement, page 18).

Is there evidence against minimal-static phase models? I am currently aware of one conceptual counter-argument. In the standard system, the “backbone” of the derivation is a sequence of the type ‘phase head - non-phase head - phase head - non-phase head’ (C - I - v - V; Chomsky 2000, 2001). This constellation is motivated in Richards (2007): Uninterpretable  $\phi$ - and tense features are properties of phase heads; they belong to C, not to I (which explains that infinitival clauses

in raising and ECM constructions lack both C and  $\phi$ -features on I). The uninterpretable features are thus “handed down” from C to I. According to Richards (2007), the reason for why feature inheritance must take place is that valuing and spellout of uninterpretable features must happen simultaneously (on the assumptions that uninterpretable features are removed during spellout, and that the derivation crashes if valued uninterpretable features stay in the derivation, as they could not be recognised anymore as being uninterpretable once they are valued; see Epstein et al. 2008 for a different view). Each phase head therefore needs a non-phase head to discharge its uninterpretable features; it needs, however, exactly *one* non-phase head. The existence of more or less than one non-phase head is therefore not motivated by the SMT. However, note that even given all background assumptions made are correct, this account does not necessarily call for a ‘phase head - non-phase head - phase head - non-phase head’ system. The argumentation would also work out in a system in which each phrase is a phase: the current phase head always has a lower head to inherit its features to;<sup>45</sup> after all, the inheriting head does not need to be a non-phase head.

Two further issues have to be addressed in a minimal-static system: the role of the Strict Cycle Condition, and the role of the Minimal Link Condition.

The role of the SCC is discussed in Müller (2004): The PIC restricts possible positions for the goal, and it is defined for the syntactic domain of the phase: Elements in the tree that are not within the current phase are inaccessible to the current probe. The SCC, on the other hand, restricts possible positions for the probe, and its syntactic domain is the phrase: Potential probes other than the currently active head cannot act as probes. The situation is thus that there are two basic constraints that are defined for entirely different syntactic domains. This asymmetry is a questionable system property: “In an optimally designed system, we would expect more symmetry in domains for probe and goal localization: Either the local domain of the SCC should be the phase (not the phrase), or the local domain of the PIC should be the phrase (not the phase)” (Müller 2004:295). A minimal-static phase system has the advantage that the PIC is defined for the same local domain as the SCC, that is, the phrase.

A second point that has to be discussed is the relation between the PIC and the Minimal Link Condition (MLC).

(258) *Generalised Minimal Link Condition* (e.g. Fitzpatrick 2002):

In a structure  $X_{[\bullet F \bullet]} \dots [Y_{[F]} \dots [Z_{[F]}]]$ , movement to  $[\bullet F \bullet]$  can only affect the category bearing the  $[F]$  feature that is closer to  $[\bullet F \bullet]$ .

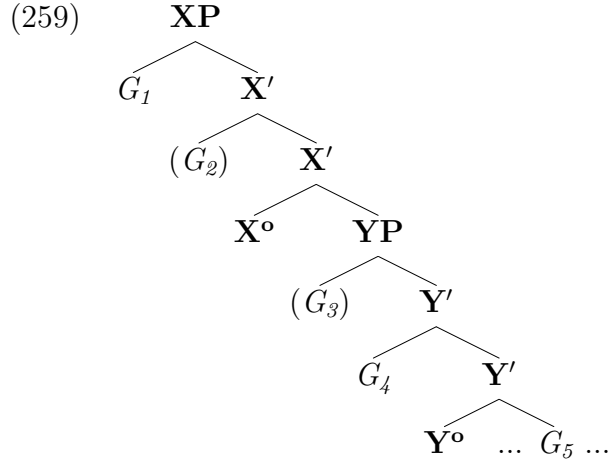
As Müller (2004, 2006a) notes, the effect of the MLC is limited by the PIC, as the MLC presupposes search space, while one of the conceptual reasons for phases is to reduce the derivational complexity and thus relieve active memory by limiting

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45. Apart from the lowest V head, which is maybe a special case, but so is the highest phase head, which seems to be able to Transfer itself including its edge (see Lahne 2007a).

the search space (Chomsky 2004).

In what follows, I will refer to subportions of a structure in which X is a (phase) head, and Y the next lower (phase) head;  $G_1$ - $G_5$  are potential goals:



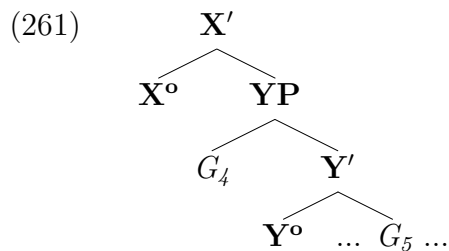
There are four possible constellations that the MLC is to derive:

- (I) *The superiority case:*  
A probe X has to decide between a goal at the edge of Y and a goal located in the complement of Y ( $G_4$  vs.  $G_5$ ).
- (II) *The Equidistance case:*  
X has to decide between two goals from the edge of the lower head Y ( $G_3$  vs.  $G_4$ ).
- (III) *The A-over-A case:*  
X has to decide between Y(P) and an element from the edge of Y (Y vs.  $G_4$ ).
- (IV) *The Two-Edges case:*  
X has to decide between two goals, the one at the edge of X, the other at the edge of Y ( $G_1$  vs.  $G_4$ ).

An MLC effect of type (I) is e.g. the well-known subject-object asymmetry with multiple wh-questions in English shown in (260).

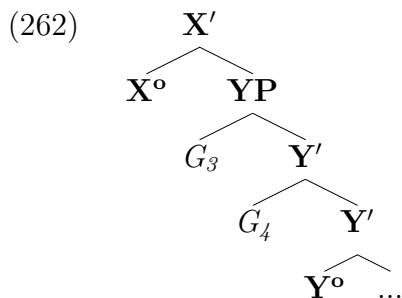
- (260) a. Who<sub>i</sub> t<sub>i</sub> saw what?  
b. \*What did who see t<sub>i</sub>?

The relevant portion of the derivation is given in (261).



Here the MLC has the desired effect that an operation cannot involve  $X^o$  and  $G_5$  due to the presence of the higher possible goal  $G_4$ . However, for this case, the effect of the MLC is limited by the PIC, as the MLC presupposes search space, while the PIC limits search space (Chomsky 2004, Müller 2004, 2006*a*) – even under the widest definition of the PIC, there are MLC effects that are ruled out by it. In a minimal-static system, the observed effect follows automatically:  $G_5$  is inaccessible to  $X$  as it is already spelled out when  $X$  is merged (Müller 2006*b*). Thus, when each phrase is a phase, then *the MLC is not needed to derive this case*. There is thus an explanatory overlap between the two principles, which should be eliminated in an efficient system. As the PIC is not a likely or desired candidate to be abandoned, the MLC must either be abandoned, or redefined in such a way that it does not comprise this case.

The only domain where the MLC could have an effect in such a system is thus the search space of the current head. The relevant portion for the equidistance case is given in (262).



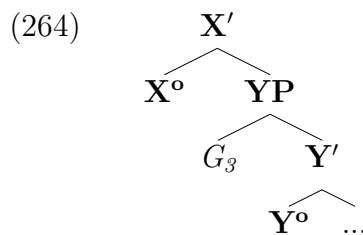
Here the MLC makes the prediction that the presence of  $G_3$  blocks operations involving  $X$  and  $G_4$ . This is the wrong result: it is in exactly this constellation where Anti-MLC effects like order-preserving movement occur (Richards 1997, Starke 2001, Williams 2003). If the MLC is still assumed to be at work, then it must either be blocked by a prioritised Equidistance principle (Chomsky 1993, 2001), or its effect must be later repaired, e.g. by Tucking-In (Richards 1997).

(263) *Equidistance* (Chomsky 2001:27):

Terms of the edge of HP are equidistant from probe P.

The question is thus, what is the status of the MLC at phrase level? Müller (2006*a*) concludes that the MLC is not at work at all at phrase level. The consequence is that there is *a priori* no preference for any of the two goals. That is a desired result, as it allows for order-preserving movement without invoking Tucking-in or Equidistance (note that the trigger for order-preserving movement is at any case an independent, additional factor); also, the Equidistance principle is not needed anymore.

However, in the two remaining cases (III) and (IV), an MLC-less system makes the wrong predictions. Let us have a look at A-over-A effects first. The relevant structure is given in (264).



Let us have a look at three examples that exhibit this constellation. The first example are Unambiguous Domination effects in German (Takano 1994, Koizumi 1995, Kitahara 1997, Müller 1998, Sauerland 1999): Scrambling of a whole VP is possible, but scrambling of an NP inside the VP followed by remnant scrambling of the VP leads to an unacceptable result. This is illustrated in (265).

- (265) a. dass [<sub>VP</sub> [<sub>VP<sub>2</sub></sub> das Buch<sub>1</sub> zu lesen] keiner t<sub>2</sub> versucht hat]  
 that the book.ACC to read no.one.NOM tried has  
 ‘That no one tried to read the book’
- b. \*dass [<sub>VP</sub> [<sub>VP<sub>2</sub></sub> t<sub>1</sub> zu lesen] [<sub>NP<sub>1</sub></sub> das Buch] keiner t<sub>2</sub> versucht  
 that to read the book.ACC no.one.NOM tried  
 hat]  
 has

The second example comes from Breton agreement (Jouitteau and Rezac 2006). Breton shows a complementarity effect in that the  $\phi$ -features of a phonologically null NP are coded by  $\phi$ -agreement morphology on the verb (=‘rich agreement’), whereas the  $\phi$ -features of a phonologically overt NP are not coded by  $\phi$ -agreement morphology on the target (‘invariant agreement’ [=frozen 3SG agreement or bare stem]). This is illustrated in (266).

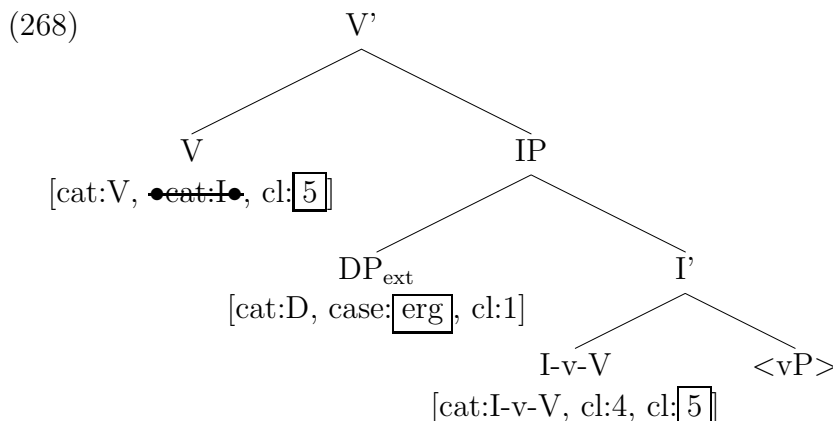
- (266) a. Gant o mamm e karf-ent / \*karf-e pro bez-añ  
 with their mother R would.love-3PL / \*would.love-3SG 3PL be-INF  
 ‘They would like to be with their mother’
- b. Gant o mamm e \*karf-ent / karf-e Azenor ha  
 with their mother R \*would.love-3PL / would.love-3SG Azenor and  
 Iona bez-añ  
 Iona be-INF  
 ‘Azenor and Iona would like to be with their mother’

Jouitteau and Rezac (2006) analyse the complementarity as a locality effect. The starting point of the analysis is the observation that *v* in Breton has nominal properties. It is thus assumed to bear interpretable 3SG  $\phi$ -features. Consequently, when *I* probes for  $\phi$ -features in its search space, then *v* intervenes between *I* and the external argument, which is contained in the *vP*. *I* must therefore value its unvalued features with  $\phi$ -features of *v*, which results in 3SG (‘frozen’) agreement on *I*. If, on the other hand, the external argument is an affixal *pro*, then it incorporates into *T* and thus contributes its  $\phi$ -features to the feature set of *T*, which leads to rich agreement.

A very similar constellation can be found in the context of long-distance agreement (LDA), which is an agreement relation that seems to hold across the boundaries of locality domains. Basically, the configuration of LDA is such that the verb of a root clause agrees with the internal argument of an embedded clause. It occurs e.g. in Tsez, Kwarshi, Kutchi Gujarati, Hindi-Urdu, Blackfoot, Chukchee, and Itelmen (Polinsky and Potsdam 2001, Khalilova 2007, Grosz and Patel 2006, Bhatt 2005, Bobaljik and Wurmbrand 2005, Bošković 2007, among others). An example from Khwarshi is given in (267).

- (267) a. Išet'ul                      y-iq'-še                      goli [uža                      **bataxu**  
    mother:OBL,LAT **cl5**-know-PRS COP [boy:ERG **bread(cl5)**  
    y-acc-u                      ]  
    **cl5**-eat-PSTPRT ].CL4  
    'Mother knows that the boy ate bread'
- b. Išet'ul                      l-iq'-še                      goli [uža                      bataxu  
    mother:OBL,LAT **cl4**-know-PRS COP [boy:ERG bread(**cl5**)  
    y-acc-u                      ]  
    cl5-eat-PSTPRT ].**cl4**  
    'Mother knows that the boy ate bread' (Khwarshi; Khalilova 2007)

Butt (1993, 1995), Chomsky (2001), Legate (2005), Lahne (2008*b*) analyse LDA as cyclic agree; i.e., the matrix verb agrees with the embedded verb, which has previously agreed with the embedded object. The relevant portion of structure is shown in (268). The gist of the analysis proposed in Lahne (2008*b*) is that LDA takes place if v-V moves to I and thus contributes the class features of the embedded object, which it receives by agreement. If, however, v-to-I movement does not take place, then matrix V only finds embedded I's inherent class feature [cl:4].



The important point for our discussion is that the external argument at the edge of I never intervenes in the agreement between matrix and embedded verb (see Bobaljik 2006:29). Thus again, the data suggest that a probe “prefers” agreeing with head Y to agreeing with an element at the edge of Y.

A first sight, these data are not accounted for if the MLC is completely abandoned. They can, however, be derived from a weaker version of the MLC in which the condition for intervention is dominance (Müller 2004):<sup>46</sup>

(269) *A-Over-A Condition (Chomsky 1964):*

In a structure  $A \dots [A \dots] \dots$ , an operation can only affect the higher, more inclusive category  $A$ .

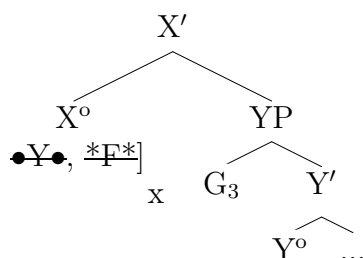
The A-over-A Condition correctly derives A-over-A cases, and is at the same time not defined for the Superiority and Equidistance cases, which is the desired result (Müller 2004). However, even this last residue of the MLC can be derived by a different, independently well-motivated principle, namely Chomsky's (2001) principle 'Maximise Matching Effect':<sup>47</sup>

(270) *Maximize Matching Effects (MME; Chomsky 2001:15)*

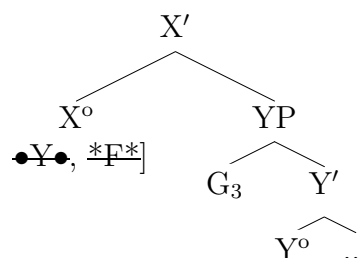
If local (P,G) match and are active, their interpretable features must be eliminated at once, as fully as possible; partial elimination of features under Match, followed by elimination of the residue under Match, is not an option.

(270) has the effect that the current probe  $X$  has to handle its selectional feature  $[\bullet\text{cat:Y}\bullet]$  by merging with a head  $Y$ ; due to MME, agree between  $X$  and  $Y$  must involve handling of the maximal number of matching features. Thus, if  $X$  has another feature  $[*F*]$  that it can value with a feature of  $Y$ , then it must value it with  $Y$ . This is illustrated in (271).

(271) a.



b.



Let us now consider the remaining two-edges case. The relevant structure is shown in (272).

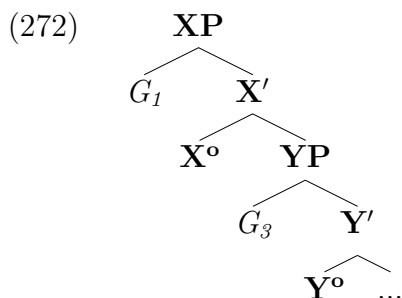
46. Note that this runs counter to Pesetsky and Torrego (2001), where head and specifier are taken to be equidistant.

47. Lahne (2008b) argues for a generalised version of this constraint:

(i) *Maximize Matching Principle (MMP).*

(Let  $\pi$  be a Probe and  $P$  the feature set of  $\pi$ . Let  $\gamma$  be a Goal in the search space of  $\pi$  and  $G$  the feature set of  $\gamma$ .) A feature set  $Q \subseteq P$  with  $|Q| \geq 1$  must be satisfied with a feature set  $H \subseteq G$  iff.  $H$  is the most specific goal in the search space of  $\pi$ .

Specificity is determined by cardinality: A Match between  $Q$  and  $H$  is more specific than a Match between  $Q'$  and  $H'$  iff.  $|Q| > |Q'|$  (Halle 1997).



It was already argued that the original MLC cannot be retained. Crucially, if only the A-over-A Condition is retained, then  $G_1$  does not block agreement between  $X$  and  $G_3$ . There are, however, data that suggest that the presence of a higher specifier does indeed block a value operation between a head and an element at a lower phase edge. Right such a case was discussed on page 21, where the presence of the external argument forced  $v$  to assign its feature  $[\text{case:internal}]$  to  $\text{NP}_{\text{ext}}$ , and not to the internal argument, which is located within the VP (i.e., within  $v$ 's complement). A second example of specifier intervention is Lahne's (2008a) account of Mahajan's Generalisation, which was presented on page 22. The analysis works in such a way that in ergative languages, the presence of specifier of  $I$  blocks agreement between  $I$  and an element at the edge of  $v$ . A third example will be presented later on in section 5.2: Verb inversion in the context of successive-cyclic movement is analysed as a result of the early timing of Phase Balance: *wh*-movement to the edge of  $I$  happens before  $I$  can deal with its own EPP and  $\phi$ -features. The *wh*-element then blocks Value/Agree between  $I$  and elements at the edge of  $v$ . As a result,  $I$  must move to  $C$  by a last-resort operation in order to satisfy these features.

These examples suggest that in structures of type (IV), intervention by closeness does seem to play a role after all. So what do we do? One possible solution is to define an intervention condition that jumps in only in constellations of type (IV), and that has the effect that specifiers of  $X$  are closer to  $X$  than specifiers of  $Y$ , while the specifiers "within" an edge do not block each other. This constraint needed to be defined in such a way that it only holds for Value/Agree relations, and not for structure building, as derivation by phase unquestionably involves successive-cyclic movement from the edge of  $Y$  to the edge of  $X$  even if  $X$  already has one or more specifiers.<sup>48</sup> I will however not follow this path, as it will presumably amount to a definition that is simply stipulated, which would be an unsatisfying result. A second and arguably more desirable solution would be to explain the seeming MLC-effect in case (IV) by means of an independent principle. This is the way I want to go, and there is indeed such a principle at hand: Maximize Matching Effects. In the first two examples discussed, the intervening specifier is merged due to a selectional feature  $[\bullet\text{N}\bullet]$ . MME has the effect that Agree between a probe and a goal must involve the maximal number of matching features. Hence, if  $X$  satisfies a selectional feature by merging a specifier  $G_2$ , and if it can satisfy more features with  $G_2$ , then it must satisfy these features with  $G_2$ . Hence, Value/Agree

48. This is indeed the solution proposed in Müller (2008a) and Lahne (2008a), where intervention is defined by closeness (path): a specifier of  $X$  is closer to  $X$  than an element contained in the complement of  $X$ .



operations involving  $X$  and  $G_3$  are blocked. Merge operations, on the other hand, are not blocked, as a second specifier is merged by an edge feature or a second  $[\bullet D \bullet]$ -feature, which cannot be satisfied by internally merging  $G_1$  again within the edge of  $X$ .

To sum up this discussion, in a minimal-static system, MLC effects are a result of phase-based derivation on the one hand (=case [I]), and of the principle Maximize Matching Effects on the other hand (=cases [III] and [IV]). Neither the PIC nor MME hold for case (II), which is the desired result, as now no additional principle is needed to allow for Anti-MLC effects (again, note that the trigger for order-preserving movement is at any case an independent, additional factor). The strong conclusion from this discussion is that the Minimal Link Condition can indeed be abandoned in a minimal-static system.

## 6.2 Goal 2: Deriving Reflexes of Successive-Cyclic Movement

The second goal was to propose a uniform analysis for morphological and syntactic reflexes of successive-cyclic movement. This is yielded by a new implementation of movement to intermediate phase edges. The basic idea is that the successive-cyclic application of local movement steps is triggered by edge feature insertion. More precisely, what is inserted is merely the property of triggering movement. This property is fused with a particular, already existing feature of the current phase head. When this newly created edge feature is satisfied, then the whole feature is deleted. The phase head is now impoverished, with the consequence that a different, less specific marker “than usual” is inserted at vocabulary insertion. In other words, in the new model, impoverishment happens during the syntactic derivation.

The data and analyses yielded a new generalisation, which is repeated here from page 60: When a language shows different exponents in movement and non-movement contexts, then the marker appearing in the context of movement is less specific than the marker appearing in non-movement contexts (=retreat to the general case, emergence of the unmarked).

The new analysis has the advantage that it offers a uniform approach to morphological and syntactic reflexes of successive-cyclic movement which is yielded by a minimal change in the modelling of movement to the edge. The verbal morphology in the context of long movement automatically follows from the analysis; further assumptions are not needed. In addition, the approach derives the effects of (seeming) extraction restrictions correctly without actually invoking these restrictions. Furthermore, syncretisms in the verbal morphology of Chamorro and Irish are not treated as homonyms, but as occurrences of one and the same underspecified marker. Finally, the analysis delivers a new argument in favour of finite control as movement, and resolves two puzzles in the syntax in Kikuyu (subject-object extraction asymmetry, location of *wh*-subject below complementiser) by deriving that *wh*-subjects in this language can stay in situ while at the same time extraction morphology shows up.

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