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Universität Potsdam

Hans Broekhuis | Ralf Vogel (eds.)

Optimality Theory and Minimalism: Interface Theories

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**Optimality Theory and Minimalism:
Interface Theories**

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Preface

This issue of *Linguistics in Potsdam* contains a number of papers that grew out of the workshop “Interface theories: the filtering of the output of the generator (DEAL II)”, held in Leiden on February 22-23, 2008. This workshop should be seen as a follow-up to the DEAL I conference held in December 2005 in Berlin, the proceedings of which have been published earlier as LiP 25 (www.ling.uni-potsdam.de/lip). Whereas the focus of DEAL I was on problems concerning the *descriptive and explanatory adequacy* of the more traditional versions of the minimalist program and optimality theory, DEAL II was devoted more specifically to issues concerning the *interfaces* between syntax proper and the other components of the grammar, i.e., semantics, morphology, and phonology (see <http://let.uvt.nl/deal08/call.html> for the call for papers).

The papers contained in this issue share the insight that the different components of the grammar sometimes impose conflicting requirements on the grammar’s output, and that, in order to handle such conflicts, it seems advantageous to combine aspects from minimalist and OT modelling. The papers show that this can be undertaken in a multiplicity of ways, by using varying proportions of each framework, and offer a broad range of perspectives for future research.

We hope that this collection will encourage people who are currently working within just one of the two frameworks to broaden their vision by also considering the possibilities that the alternative framework offers, and that this will stimulate further fruitful debate among syntacticians from the two frameworks, just as the conference itself did.

Hans Broekhuis

Ralf Vogel

Leiden and Potsdam, Dec 6, 2008

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Hard and soft conditions on the Faculty of Language: constituting parametric variation *

Hedde Zeijlstra

University of Amsterdam

In this paper I argue that both parametric variation and the alleged differences between languages in terms of their internal complexity straightforwardly follow from the Strongest Minimalist Thesis that takes the Faculty of Language (FL) to be an optimal solution to conditions that neighboring mental modules impose on it. In this paper I argue that hard conditions like legibility at the linguistic interfaces invoke simplicity metrics that, given that they stem from different mental modules, are not harmonious. I argue that widely attested expression strategies, such as agreement or movement, are a direct result of conflicting simplicity metrics, and that UG, perceived as a toolbox that shapes natural language, can be taken to consist of a limited number of markings strategies, all resulting from conflicting simplicity metrics. As such, the contents of UG follow from simplicity requirements, and therefore no longer necessitate linguistic principles, valued or unvalued, to be innately present. Finally, I show that the SMT does not require that languages themselves have to be optimal in connecting sound to meaning.

Keywords: Parameters, Simplicity, Complexity, Uninterpretability, Agreement, Movement

1 Introduction

Following current minimalist reasoning, language is thought to be a perfect system connecting sound and meaning (cf. Chomsky 2000, 2001, 2005a,b,

* Many thanks to Theresa Biberauer, Hans Broekhuis, Olaf Koeneman, Ralf Vogel and Fred Weerman and the audience of DEAL II for their valuable comments and discussion. All errors are of course mine.

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Lasnik 2003). The strongest formulation of this idea is The Strong Minimalist Thesis (SMT): Language is an optimal solution to interface conditions that the Faculty of Language (FL) must satisfy (Chomsky 2005b: 3).

However, the idea that language is some kind of a perfect solution seems to be at odds with the huge amount of cross-linguistic variation that can be attested. This leads to the following question: if language is an optimal solution to interface conditions that the Faculty of Language (FL) must satisfy why would not all languages be morpho-syntactically uniform?

Implementing this question within the Principle and Parameters model, initiated by Chomsky 1981, that takes cross-linguistic variation to be the result of a relatively small amount of parameters to be set during the process of language acquisition, the question rises as to why parameters should exist in the first place?

In this paper I argue that parametric variation is not incompatible with the SMT. Instead, I argue that the SMT, given that it takes language to be an optimal solution to conditions that are imposed on FL by *different* mental modules, allows for multiple solutions as long as these are all optimal. If the SMT allows for multiple solutions it would even require additional explanation why natural language would not exhibit cross-linguistic variation.

However, a question that then immediately rises is whether all languages are actually equally simple? If two languages both form an optimal solution in the task of relating sound to meaning, one language is expected not to be more complex than the other, since otherwise the simplest solution would be the only optimal one.

Although the idea that languages are equally complex has been proposed by a number of scholars (see for an overview and discussion Degraff 2001), this view is far from being uncontroversial. In a number of recent proposals (e.g.

Kusters 2003, Gil 2001, Ramchand and Svenonius 2006) it has been argued that languages actually differ with respect to their internal complexity.

In this paper, I argue that that the interplay between principles governing FL and principles governing the process of language acquisition actually allows one language to be more complex than the other.

In a nutshell, I propose that UG should be regarded as a toolbox (to use Jackendoff's 2002 metaphor) that contains different strategies for expressing semantic functions (those strategies are the tools, so to speak). The existence of these tools (why exactly these and why not any more or any less) follows directly from the SMT. The process of language acquisition then is considered as a process where language learners detect on the basis of their language input which tool(s) are used to express each semantic function. If the target language happens to use multiple tools for the expression of a single semantic function, then the language acquirer is forced to adopt both expression strategies.

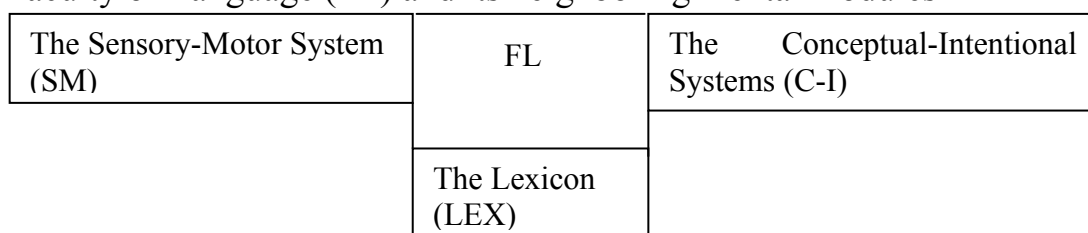
This paper is set up as follows: first, in section 2, I discuss the implications of the SMT and I argue that hard conditions applying to FL invoke soft conditions as well that take the shape of simplicity metrics. In section 3, I zoom in on one particular hard condition that applies at both the interface between FL and the Sensory-Motor system (SM) and the interface between FL and the Conceptual-Intentional systems (C-I), namely the requirement that the derivational outputs of FL are legible for both SM and C-I (dating back to Chomsky's 1986 formulation of Full Interpretation and I argue that Chomsky's later version of Full Interpretation, which bans uninterpretable features at LF (cf. Chomsky 1995), actually follows from simplicity metrics that are invoked by this legibility condition. In section 4, I argue that the simplicity metrics that are invoked by the hard condition that the derivational output must be legible both at the level of Logical Form (LF) and Phonological Form (PF) are in conflict and I demonstrate that this conflict calls syntactic operations such as Move and

Agree into being. A side effect of these assumptions is that the existence of uninterpretable features, albeit conceived slightly different from the original notion of uninterpretable features in Chomsky 1995, receives a principled explanation. In section 5, I come back to the alleged problem that different languages may exhibit different levels of complexity and I demonstrate that, contrary to what is generally assumed, combinatorial usage of different expressing strategies of semantic functions is not banned by the SMT, but actually falls out of it, given that principles that shape UG also shape the language acquisition process. Section 6 finally concludes.

2 Hard and soft conditions imposed on the Faculty of Language

I adopt, following Chomsky 1995 and subsequent work, the model in (1) that takes FL to be an autonomous mental module that is connected with other (autonomous) mental modules. In this model, FL interacts with three other mental modules: SM, C-I and the lexicon (LEX), an instance of memory.

(1) Faculty of Language (FL) and its neighboring mental modules



Following, Chomsky who claims that if the SMT holds ‘UG would be restricted by properties imposed by interface conditions’ (Chomsky 2005b: 3), FL, in the model in (1), must then be restricted by conditions that the SM system, the C-I system or LEX induce.

Both at the level of LF, i.e. the interface between the C-I system and FL, and at the level of PF, i.e. the interface between the SM system and FL, hard

conditions, such as legibility conditions, apply. Such conditions restrict the possible grammatical outcomes of the derivational process.

Although hard conditions applying to FL already severely restrict UG, the SMT not only requires that hard conditions be fulfilled, but also that they are fulfilled in an optimal way. This claim implies that different solutions to hard conditions are evaluated against simplicity metrics that evaluate possible solutions and rule out non-optimal solutions. Putting this formally:

- (2) If some hard condition **C** comes along with a simplicity metric **S** and solution S_1 to fulfill **C** is a simpler solution w.r.t **S** than solution S_2 , then the possible application of S_1 rules out S_2 .

Hence the fact that **C** invokes **S** imposes another restriction on FL: $*S_2$. But it should be noted that $*S_2$ is not a hard condition by itself. On the contrary, S_2 is only ruled out by virtue of S_1 being a possible solution. If for some reason application of S_1 is ruled out on independent grounds, S_2 is no longer banned. In fact, S_2 in that case is even the preferred solution.

But then the question immediately rises as to what could rule out S_1 , given that it optimally satisfies **C**. Two logical possibilities arise. First S_1 could violate another hard condition. In that case S_1 may never apply. But a second possibility arises as well. Suppose that not one but two hard conditions apply: **C**₁ and **C**₂, both with corresponding simplicity metrics **S**₁ and **S**₂ respectively. Now suppose that **S**₁ and **S**₂ have the following forms:

- (3) **S**₁: $S_1 > S_2 > \dots$
S₂: $S_2 > S_1 > \dots$

If the simplicity metrics in (3) both apply, they cannot be both optimally satisfied. Satisfying C_1 in an optimal way entails that S_1 is preferred over S_2 . But preferring S_1 over S_2 entails that C_2 is not satisfied optimally. Alternatively, if S_2 is favored over S_1 , C_2 is optimally fulfilled at the expense of C_1 .

Note that in cases like (3) nothing requires that one simplicity metric is stronger than the other. Hence, if there is no external ground that forces optimal satisfaction of C_1 over C_2 , both simplicity metrics must be equally strong. As a result, the SMT invokes two different strategies that enable FL to optimally satisfy interface conditions imposed on it.

The question then arises as to whether situations like (3), where two optimal solutions cancel each other out, are natural or expected on conceptual grounds. The answer to this question is univocally yes. Especially since mental modules neighboring FL are (semi-)autonomous, it would in fact require independent motivation if all simplicity metrics induced by hard interface conditions were in harmony. Nothing guarantees that different cognitive systems like the C-I and the SM systems work in such a way that the conditions they impose on FL are identical with respect to the way that they be optimally fulfilled. Of course nothing rules out conditions that do not face any contradictory simplicity metric and such conditions will always be optimally satisfied, but since not all conditions are in harmony, variation is already called into being.

The general and most radical hypothesis following from this line of reasoning is that the entire range of cross-linguistic variation results from conflicting simplicity metrics induced by different hard interface conditions imposed on FL. In this paper I argue that cross-linguistic variation with respect to two expressing strategies of semantic functions, morphological marking and (head) movement, are a direct result of the fact that the SMT constitutes multiple strategies for FL to fulfill hard interface conditions in an optimal way.

3 Full Legibility and Full Interpretation

As discussed above, one hard condition that is imposed on FL is that derivational outputs must be legible to the respective interpretational systems at the levels of the interfaces. At LF the derivation must be legible for the C-I system, and at PF it must be legible for the SM system. In this section I argue that this hard condition induces a weaker version of Chomsky's 1995 formulation of the Principle of Full Interpretation and that the current stipulative formulation of this principle is too strong.

3.1 Full legibility and the C-I interface

Let me formalize the hard condition that derivational outputs must be legible at the level of interfaces by introducing the Principle of Full Legibility (PFL):

- (4) *Principle of Full Legibility (PFL)*: the derivational output of FL must be fully legible for any interpretational system for which such an output forms an input.

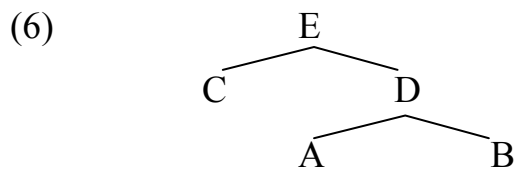
PFL is of course reminiscent of Chomsky's Principle of Full Interpretation (PFI), but it is a weaker notion. It only requires LF representations to be legible, nothing more. In this sense it crucially differs from Chomsky's original formulation of PFI (Chomsky 1986), which is also meant to rule out vacuous quantification. But, as Potts 2002 has demonstrated, the ban on vacuous quantification is not a necessary constraint on syntactic structures and therefore does not have to follow from any hard conditions applying to FL.

PFL is also weaker than Chomsky's 1995 version of PFI, which states that every element at LF must receive interpretation:

- (5) *Principle of Full Interpretation (PFI)*: every element of an output representation should provide a meaningful input to the relevant other parts of the cognitive system (after Chomsky 1995).

The main difference between PFL and this version of PFI is that PFL states that every (part of a) syntactic object must be legible to the C-I systems, whereas PFI requires that every (part of a) syntactic object must have semantic content. However, legibility does not presuppose semantic content.

To illustrate this, take for instance the tree in (6):



Now suppose that A is semantically empty, i.e. it contains only formal features at LF. In that case the denotation of D is identical to the denotation of B. If no other grammatical ban is violated and D can be a semantic complement of C (or vice versa), nothing renders (6) illegible at LF. Following PFL (6) is ruled in. Hence, the PFI condition that rules out semantically empty elements in syntactic representations at the level of LF does not follow from any legibility condition and therefore counts as a stipulation.

Note that in a way such a stipulation is even counterintuitive. Saying that the presence of some element blocks the interpretation of a structure that would otherwise receive a proper interpretation at LF presupposes that the presence of such an element has interpretational effects and as such it cannot be said to be fully uninterpretable.

The question now rises what kind of elements have such properties that they can appear at LF without adding anything to the semantic interpretation. Note

that traces, if they are perceived as copies, do have semantic content. In standard semantic theory they are considered to be variables (cf. Heim & Kratzer 1998, Sportiche 2005), whereas uninterpretable features in the sense of Chomsky 1995, 2000, 2001 are said to be free from semantic content.

Note that in their very essence uninterpretable formal features ([uF]'s henceforward) only drive syntactic operations and are strictly speaking only formal in nature: it is a formal requirement that at some point in the derivation they must stand in some particular configurational relation with an interpretable counter feature ([iF]). [iF]'s are both formal and semantic in nature (formal in the sense that they can establish so-called agree relations with [uF]'s, semantic because they are non-vacuously interpreted at LF), but given the fact that [uF]'s are only formal and therefore purely blind to the semantic properties of [iF]'s, it is not a semantic property of [iF]'s, but a formal property that allows it to license [uF]'s.

A major advantage on this more formal perspective on (un)interpretable features is that no look ahead problems arise, as recognition whether some element carries an [iF] or not is now taken to be part of the derivational syntactic process. Suppose that the semantically empty element A in (6) carries a feature [uF] and suppose that C carries [iF]. Then after merger of C with D all formal requirements of A have been met, even before the structure is transferred to LF.

Still, it remains an open question as to why uninterpretable features would occur at LF against the economical background of the SMT. Initially, this was the ground on which their occurrence was banned at LF, inducing the still unsolved question as to why uninterpretable features exist in the first place. The ban on uninterpretable features at LF does not follow from PFL, the hard condition that requires that derivational outputs be legible.

But if the SMT holds, it also follows that PFL is optimally satisfied. Although legibility is not affected by the presence of uninterpretable features,

their presence does not facilitate legibility either. Hence PFL induces the following soft condition:

(7) C-I Simplicity Metric (Zeijlstra 2007):

A structural representation R for a substring of input text S is simpler than an alternative representation R' iff R contains less uninterpretable features than R' .

Following the line of reasoning sketched in section 2, the simplest solution to satisfy (7) is by banning all uninterpretable features. Then Chomsky's assumption that uninterpretable features be ultimately removed at the level of LF, now follows from the simplicity metric in (7), modulo one major difference: the C-I simplicity metric is a soft condition. If for some reason the null-option, i.e. absence of [uF]'s at LF, blocks another, equally strong, simplicity requirement, their presence may be motivated again.

In the following subsection I argue that the application of PFL at the interface between FL and SM induces a simplicity metric that prefers derivational outputs at LF that contain semantically uninterpretable features over outputs that lack them.

3.2 Full legibility and the SM interface Document Setup

PFL does not only apply at the level of LF, but also at the level of PF. Derivational outputs must be legible for the SM system and this requirement must be met in an optimal way. Equivalent to the application of PFL at LF, this means that PFL induces a second simplicity metric that, being a soft condition, bans the presence of what could be metaphorically called 'phonologically uninterpretable features', i.e. formal features without any phonological content.

Such features must have the property that they are purely formal in nature but lack phonological content, i.e. phonologically null elements.

Neeleman and Van der Koot 2006 who base themselves on Chomsky and Halle 1968 and McCawley 1968, take phonological outputs to be linear with prosodic categories thought of as phonological boundaries. The prosodic/phonological structure of sentence like (8) is thus represented as (9) where U stands for Utterance, I for intonational phrase, Φ for prosodic phrase, ω for prosodic word, F for foot and σ for syllable. U at the beginning and at the end of (9) means that the sentence be preceded and followed by an intonational break.

(8) John's father suggested a two-seater but John's mother preferred a fur coat

(9) U John's ω father Φ suggested ω a two-seater I but ω John's ω mother Φ preferred ω a fur ω coat U .

Neeleman and Van der Koot argue that prosodic categories are hierarchically ordered (from weak to strong) as in (10).

(10) $\sigma < F < \omega < \Phi < I < U$

Prosodic categories, perceived as prosodic boundaries, are thus not banned from phonological representations, but their occurrence should be as limited as possible, since their appearance cannot be motivated in terms of phonological legibility either. Hence, PFL must invoke the following simplicity metric.

(11) SM Simplicity Metric:

A formal representation R for a substring of input text S is simpler than an alternative representation R' iff R contains less prosodic boundaries than R' .

Hence, both uninterpretable formal features and prosodic boundaries are dispreferred by PFL, given the C-I and SM simplicity metrics. In the next section, I demonstrate that these metrics are in conflict and that for that reason the C-I and SM simplicity metrics can never be optimally satisfied at the same time.

4 Conflicting simplicity metrics

In this section I demonstrate that the C-I and SM simplicity metrics cannot be optimally fulfilled at the same time. That is to say, expressing a semantic function without using uninterpretable features must lead to the introduction of prosodic boundaries, and alternatively, expressing such a semantic function without such prosodic boundaries will inevitably lead to an introduction of a semantically uninterpretable feature. This immediately leads to the question as to why expression strategies for semantic functions that lack both uninterpretable features and strong prosodic boundaries are forbidden.

In its very essence, the answer to this question is the following: the main effect of the SM Simplicity Metric is to spell out as much possible on one and the same lexical node, but semantic functions cannot occupy any arbitrary position in the syntactic structure and require uninterpretable features to ensure possible interpretation at LF.

Let me illustrate this by discussing past tense, which is subject to cross-linguistic variation with respect to the way it is expressed. One way to express past tense is by using a single word for it, something like *past*, as is the case in

expression strategy (12). Under this strategy, there is a 1:1 correspondence between the word for past tense and the semantic past tense operator. Although such a strategy is not very frequently attested, several languages, e.g. West-Greenlandic (cf. Bittner 2005), express past tense in such a way.

However, in many languages, and English is no exception to this observation, past tense is expressed by means of a temporal affix rather than a temporal adverb that, being a prosodic word, would stand on its own. English thus prefers a different expressing strategy (the one in (13)) to the West-Greenlandic type of strategy in (12).

(12) Wolfgang *past* play tennis

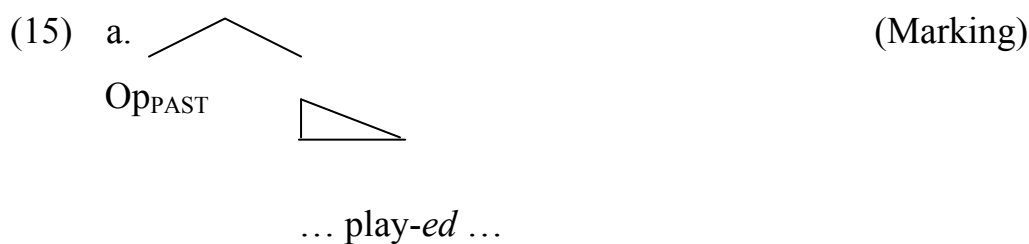
(13) Wolfgang play-*ed* tennis

But under this strategy semantic past tense no longer follows directly from the temporal morphological marker *-ed*, since the semantics of past tense does not allow for a direct interpretation in the position where the lexical verb *play-ed* is base-generated. Past tense is a semantic operator that must outscope the entire vP, i.e. the fully saturated argument structure of the predicate (see e.g. Klein 1994, Ogihara 1996, Abush 1997, Kratzer 1998, Von Stechow 2002). This is illustrated in (14).

(14) Wolfgang played tennis on every Sunday (Von Stechow 2002)
 = ‘For every Sunday in Past_c there is a time t at which Wolfgang plays tennis’
 ≠ ‘There is past time on every Sunday at which Wolfgang plays tennis’
 ≠ ‘For every Sunday, there is time before it such that Wolfgang plays tennis at that time’

The only available reading is the one where past tense outscopes the distributive quantifier *every Sunday*, which in its turn outscopes the lexical verb *play*. Consequently, past tense affix *-ed* therefore cannot be assigned the semantics of the past tense operator in the position that it occupies at surface structure. But what then is the contribution of *-ed*, if it cannot be interpreted at surface structure? How can *-ed* induce the semantics of past tense, if at the same time it cannot be interpreted at its base position in the sentence?

Two logical possibilities arise: either (i) *-ed* is not the semantic past tense operator itself, but merely a true marker of an abstract operator that is responsible for the semantics of past tense; or (ii) *-ed* is the semantic past tense operator itself, but a structural transformation takes place such that both *-ed* and *play* can be interpreted in the proper position. The two strategies can be tentatively called *marking* and *displacement* and the way they function is sketched in (15).



In (15a) *-ed* is a marker that signals the presence of the past tense operator in its proper position, i.e. above VP; in (15b), due to the transformational operation that has been applied, *-ed*, itself being the carrier of the semantic contents of the

past tense operator, is now in a position where it can be properly interpreted and as a result of the same transformational operation, be disconnected from the position where the lexical content of the verb *play* is interpreted.

In the following two subsections section I demonstrate that in both cases the presence of an uninterpretable feature is required. In a nutshell, I argue that in (15a) *-ed* must carry an uninterpretable past tense feature, marking the presence of an abstract operator carrying an interpretable past tense feature. And I argue that in (15b) we find two copies of the finite verb, whereas only one gets interpreted. For that reason, at least one of the two verbs may be interpreted as carrying verbal contents; the other copy must be analyzed as carrying an uninterpretable verbal feature.

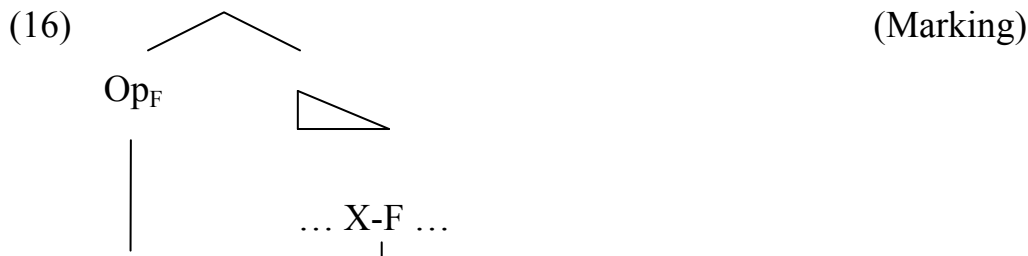
If those analyses are correct, the SM Simplicity Metric favoring expression of as much material as possible on the same lexical node, can then only be maximally satisfied at the expense of the C-I Simplicity metric which bans uninterpretable features. Vice versa, a strategy as in (12) which can be directly interpreted at LF without any rescue strategy that requires uninterpretable features, violates the SM Simplicity metric, as it introduces new prosodic boundaries. Thus, the interplay between the SM and the C-I Simplicity Metric already gives rise to two different types of strategies: one type that prefers prosodic boundaries over uninterpretable features and one type of strategies where uninterpretable features are preferred over prosodic boundaries.

4.1 Marking, Uninterpretability and Agree

Now let's zoom in at the marking strategy exemplified in (16a), where a marker only indicates the presence of an abstract operator in the appropriate position. More abstractly, this means that some root X is equipped with an additional marker. Such a marker can be an affix, but it does not necessarily have to be one: vowel alternation or other instances of marking (e.g. syncretisms of

multiple markers) are equally well possible. Let us call the marker F. In the case of affixation, a root plus marker is thus of the form X-F.

As discussed before, F is not the carrier of the semantic contents of the operator. The structure of a sentence containing X-F is rather like (16), where a covert operator (Op_F) is responsible for the semantic contribution, which is manifested by F.



This structural relation in (16) are governed by the following three conditions:

- (17) a. $[Op_F [... X-F ...]]$
 b. $*[... X-F ...]$
 c. $*[Op_F [... X ...]]$

The conditions in (17) state that F demands the presence of an operator Op_F and that abstract Op_F may only be included if F is present. The conditions in (17) are an implementation of what Ladusaw refers to as a mechanism of self-licensing (Ladusaw 1992). The abstract operator is licensed by the presence of Op_F and Op_F fulfils the licensing requirements of F. Since Op_F is abstract, marking strategy (16) serves the SM Simplicity metric in the sense that only an affix is sufficient to express past tense and that no new morphological word needs to be

included. At the same time, this marking strategy needs the formal properties that F exhibits. Hence, the question rises as to what properties does F actually exhibit, such that the conditions in (17) follow?

To recapitulate, F must be morpho-syntactically visible, F may only occur in a grammatical sentence while standing in a syntactic relation with Op_F ; and F must be semantically empty. The reader will recall from the previous section that these are exactly the properties that define uninterpretable formal features. Thus, F must be an uninterpretable formal feature $[uF]$. In other words, it is only possible to mark a semantic function by means of an (affixal) marker, that itself does not contain any semantic contribution, if that (affixal) marker itself is the carrier of an uninterpretable feature in the Chomskyan sense.

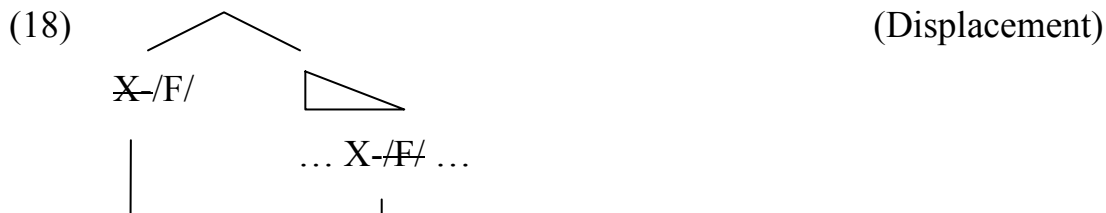
The idea that F carries an uninterpretable formal feature directly entails the conditions in (17). Conditions (17a) and (17b) follow directly, but also (17c) is a consequence of this implementation: if a sentence is grammatical and its grammaticality is not due to any of its overt elements, then a covert element must be responsible for its grammaticality; if the grammaticality of a sentence follows directly from its overt elements on the other hand there is no ground for adopting abstract material. Note that this is in its very essence a truism.

To sum up, the conditions under which an element F may mark the presence of an abstract matching operator, without contributing to the semantics of the sentence in which F occurs itself, follow immediately once it is assumed that F carries an uninterpretable feature $[uF]$ that matches with an interpretable feature $[iF]$ on the operator.

4.2 Displacement, Rmerge and Move

Marking strategies (where elements carrying uninterpretable formal features signal the presence of matching abstract operators) are not the only ways to

enable spell-out of semantically mismatching elements on one and the same morphological word, as favored by the SM Simplicity Metric. Another way would be to induce a displacement effect, such that F is semantically non-empty, and therefore does not contain any uninterpretable features, but takes scope from a different position than where X has been base-generated.



This is of course reminiscent of Chomsky's copy theory of movement or chain formation in the sense of Brody 1995. Before continuing the argument that movement is motivated by the semantic content on a particular lexical item, which can only be interpreted in a higher position, let me avoid one possible misunderstanding. The existence of movement itself does not have to be motivated. As Chomsky 2005 has argued for numerous times, a generative operation like Merge can apply internally and therefore the operation Rmerge is pre-given by Merge. However, movement is derivationally complex, and is therefore ruled out if it is unmotivated. Hence what needs to be motivated is the trigger for movement, not movement itself.

Suppose a root again takes the form X-G, where X-G now means that it is the realization of two elements, X and G, that carry both semantic content, but only X can be interpreted in situ, G cannot. One solution then would be to remerge X-G and create a higher position where G is interpreted.

- (19) PF: [...X-G...] → [... X-G ... [... ~~X-G~~ ...]]
 LF: [...X-G...] → [... ~~X-G~~ ... [... X-G ...]]

The representation in (19) is a direct result of the copy theory of movement, where first a lexical item has been copied, and then all doubly manifested material is deleted once, either in the highest or in the lowest position. In this case the highest copy is phonologically interpreted in the highest position (and deleted in the lowest position), but at LF X is deleted in the highest position and G in the lowest position. Note that this is the only structural representation that is legible at LF. All other combinations (X-G interpreted in the same position, or G interpreted below and X above) would be illegible at LF. This is exactly what has been observed in the case of past tense. A past tense operator must be interpreted outside the vP; the lexical content of a verb must be interpreted vP in situ.

However, (19) cannot be the correct derivational outcome yet, since G lacks a syntactic category. In the example G is nothing but a purely semantic past tense operator that does not carry any formal feature at all. Therefore, if X gets deleted in the highest copy, no formal feature is left over and G would not even be a syntactic object then. Syntax would be completely blind to it. Even if X is interpreted in the lowest position, it must still be syntactically visible in the highest position. A moved noun keeps the syntactic status of a noun; a moved verb the syntactic status of a verb, etc.

Hence the picture in (19) can not be complete. Although semantically X is only present downstairs, X must be formally present upstairs, without receiving any interpretation. In other words, X must be an uninterpretable formal feature in the highest position, and in interpretable formal feature downstairs. The

representation of semantically driven movement of X-G, due to G's semantic requirement to be interpreted in a higher position, must be as in (20).

$$(20) \quad [\dots X-G \dots] \rightarrow [\dots [uX]-G \dots [\dots [iX]-\cancel{G} \dots]]$$

This (simplified) view on movement takes movement to be semantically motivated. As it has standardly been assumed that head movement does not affect semantic interpretation, the burden of evidence is actually to demonstrate that head movement is indeed semantically motivated.

Applying these ideas to the expression of semantic tense, V-to-T movement can then be the consequence of the fact that the past tense morpheme is actually the carrier of past tense. Movement of the verb then results in interpretation of the past tense operator in the highest position and of the verbal contents in the lowest position.

$$(21) \quad [\dots V-PAST \dots] \rightarrow \text{LF: } [\dots [uV]-PAST \dots [\dots [iV]-\cancel{PAST} \dots]]$$

The idea that movement is essentially triggered by semantic properties rather than by morpho-syntactic requirements is reminiscent of foot-driven movement analyses (though these analyses have never been based on semantic motivations), such as Platzack 1996, Koenenman 2000 and Van Craenenbroeck 2006.

This view on movement is also supported by a recent analysis by Truckenbrot 2006, who argues that V-to-C movement activates speech act operators and is thus semantically driven. Implemented in the proposal above, V_{fin} carries initially a purely semantic feature speech act feature and a formal feature V. As the feature that has the illocutionary force of a speech act cannot

be interpreted on V° , it must move to a higher position. Given that all operators encoding illocutionary force have to precede all elements carrying propositional contents, speech act formation is easily (but not necessarily) executed by verbal fronting. V_{fin} then copies itself and the speech act is interpreted in the highest head position and the verbal contents are interpreted below. This is shown in (23) below where the phonological, syntactic and semantic representations are given for the imperative sentence in (22).

(22) Kill Mary!

(23) SEM IMP(Kill(Mary))
 SYN [V-fin_{[uV]IMP}] ... [V ~~V-fin~~_{[iV][IMP]} D]
 PHON /Kill Mary ... /

Move is then, similarly to Agree, is a marking strategy that is imposed on FL by the SM interface condition to express as much material as possible on one and the same lexical node. This condition can only be fulfilled if natural language exhibits uninterpretable material.

Note that this view on head movement unifies head movement with other types of movement (A movement, A' movement) in the sense that head movement is now also an instance of pied-piping. The formal features of V constitute the vehicle that allows G to move.

4.3 Concluding remarks

In this section I hope to have shown that both agreement and movement strategies are can only be realized if uninterpretable features are involved and that uninterpretable features are motivated because expressing strategies involving uninterpretable features can be equally optimal as expressing

strategies (such as (12)) that lack them for the very reason that reduction of prosodic boundaries can only be established by means of inclusion of uninterpretable features. Purely external merge based strategies, internal merge-based strategies and agreement strategies are thus all tools that are directly motivated by the SMT and thus constitute the UG toolbox.

Note that by no means these three strategies are exhaustive. I only demonstrated that as a result of the SMT, which invokes both the C-I and the SM simplicity metric, these strategies are called into being. Other simplicity metrics, e.g. LEX simplicity metrics could induce additional possible expressing strategies.

In any case, this line of reasoning has, I think, two major benefits. It gives a principles explanation for the existence of uninterpretable features, up till now an unsolved problem in minimalist theory; and it also gives a motivated answer to the question as to why movement is triggered, which does not rely on stipulated notions such as EPP-features.

5 Grammatical simplicity and the parametric space

So far, the proposal explains why different types of expressions for a particular Op_F exist and are cross-linguistically attested. For instance, it provides an answer to the question why uninterpretable features exist in the first place.

However, it cannot be taken to say that all languages are simplest solutions, i.e. that all languages are maximally simple, and thus select exactly one expression strategy for each semantic function. Let me illustrate that with the following examples from Afrikaans, Italian and German.

- (24) Ek sing Afrikaans
 I sing
 ‘I sing’

(25) Canto Italian

Pro_[i1SG] sing_[u1SG]

‘I sing’

(26) Ich singe German

I_[i1SG] sing_[u1SG]

‘I sing’

Afrikaans has a C-I-based strategy to express pronominal subjecthood, Italian an SM-based strategy (Agree). Both seem to be equally simple in that respect. However, German exhibits both. It has both an Agree strategy and a C-I strategy.

As has often been observed, language seems to be suboptimal rather than optimal, often used as an argument against simplicity as an underlying force in grammar. So the question rises as to how examples like (26) can be accounted for against the background of the SMT?

As discussed before, FL being an optimal solution to conditions imposed on it by neighboring mental modules, constitutes UG, i.e. the linguistic toolset. This toolset consist of a number of optimal solutions to connect form and meaning.

At the same time, FL drives language acquisition. In fact, it is even the backbone of generative theory that principles that shape UG also govern language acquisition. Simplicity metrics therefore do not only constitute possible grammars, but also guide language learnability.

Simplicity metrics applying to the language acquisition process ensure that the simplest grammar is selected during the language learning process. However, this only explains why languages are not maximally simple, but just

as simple as their target language. If for some reason the target language is not maximally simple, but takes for instance two marking strategies to express a single semantic function, than the language learner can do nothing but assign those two marking strategies to his or her own grammar.

The only question is why target languages should be non-optimal given the SMT. Note that the existence of such languages is not expected on the ground of the SMT. However, nothing excludes that external factors may play a role as well. Effects that are due to L2 acquisition in situations of language contact often cause language change effects. Thus two maximally optimal languages may interact and yield a language that ultimately is less optimal. This has been the case for instance with German.

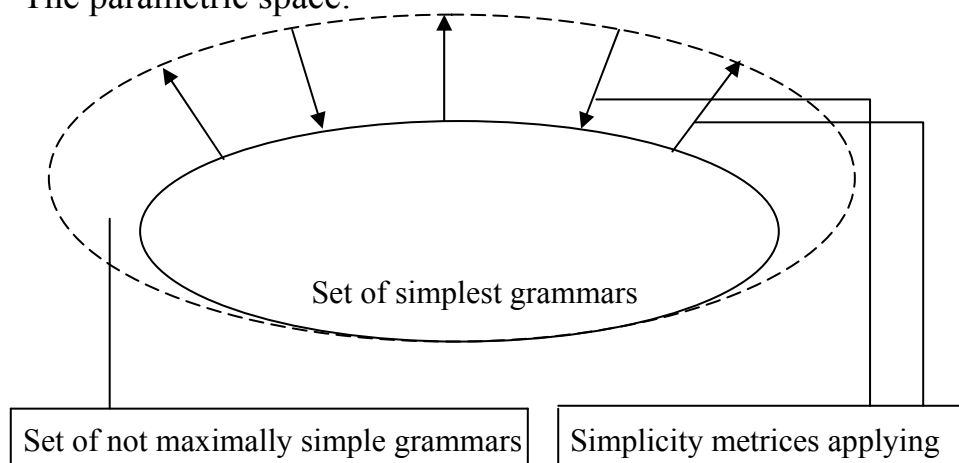
Weerman 2006 argues that proto-Germanic was a pro-drop language, just like current Italian, and that processes of language contact led to a process of deflection in the verbal paradigm: some forms eroded and the 1:1 relation between person and verbal agreement disappeared. As a result (cf. Rizzi 1986 and Neeleman and Szendroi 2006) pro-drop was no longer licensed. On the other hand, the language contact situation did not go so far that all distinctions in the paradigm were gone, as is for instance the case with Afrikaans. German is somewhere in between a full pro-drop paradigm and the Afrikaans zero-paradigm. Consequently, it exhibits both C-I-biased and SM-biased marking strategies for pronominal subjecthood.

German language learners will adopt both strategies, since this is the simplest way to satisfy the simplicity metrics. Only if the language input will undergo total deflection, the language learner will adopt the single external-merge strategy.

On the basis of this line of reasoning, a new view of cross-linguistic variation can be presented, which includes both the notion of possible and probable languages (see Newmeyer 2005 for discussion). The grammatical

space is dynamic and governed by simplicity metrics that are both upward entailing (a set of expression strategies allows application of multiple strategies) and downward entailing (select the smallest number of strategies possible for each semantic function). At the same time, every grammar that exhibits expressing strategies that are not part of UG is impossible. This view on the grammatical space, or as it is structured, on the parametric space can be modeled in (27).

(27) The parametric space:



Note that this view on language allows for parametric variation following directly from the SMT. Hence parameters do not need to be thought of as innately present, but can be taken to be derived from the idea that FL is maximally simple. Moreover, this view ensures that even though FL is taken to be maximally simple, this does not entail that every possible grammar has to be simple as well.

6 Conclusions

In this paper I argue that both parametric variation and the attested differences between languages in terms of their internal complexity straightforwardly follow from the Strongest Minimalist Thesis that takes FL to be an optimal solution to conditions that neighboring mental modules impose on it.

In this paper I argue that hard conditions like legibility at the linguistic interfaces invokes simplicity metrics that, given that they stem from different mental modules, do not necessarily have to be harmonious. In fact, I demonstrate that legibility at the interface between FL and the SM system and between FL and the C-I systems respectively already invokes two simplicity metrics that cannot be maximally satisfied at the same time.

I demonstrate that maximal satisfaction of the SM simplicity metric cannot take place without alluding to the notion of uninterpretable features, and that maximal satisfaction of the C-I simplicity metric bans spelling out multiple semantic functions on one and the same word.

I argue that expression strategies, such as agreement or movement, are a direct result of these conflicting simplicity metrics, and that UG, perceived as a toolbox that shapes natural language, can be taken to consist of a limited number of markings strategies, all resulting from conflicting simplicity metrics. As such, the contents of UG follow from simplicity requirements, and therefore no longer necessitate linguistic principles, valued or unvalued, to be innately present.

Finally, I show that the SMT, contrary to what has often been thought, does not require that languages themselves have to be optimal in connecting sound to meaning. Since UG drives the process of language acquisition, language acquisition can be modeled as a selectional procedure where it is detected for

each semantic function how it is to be expressed, which does not a priori require each semantic function to be expressed by one single marking strategy only.

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Aspect Splits and Parasitic Marking*

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Aspect splits can affect agreement, Case, and even preposition insertion. This paper discusses the functional ‘why’ and the theoretical ‘how’ of aspect splits. Aspect splits are an economical way to mark aspect by preserving or suppressing some independent element in one aspect. In formal terms, they are produced in the same way as coda conditions in phonology, with positional/contextual faithfulness. This approach captures the additive effects of cross-cutting splits. Aspect splits are analyzed here from Hindi, Nepali, Yucatec Maya, Chontal, and Palauan.

Keywords: split ergative, nepali, mayan, palauan, contextual markedness

1 Introduction

There is no standard theory of aspect splits and, in fact, aspect splits are seldom discussed in the theoretical literature. Yet the existence of aspect splits is well-known in the typological literature. The most often cited example is the split in the distribution of ergative Case in Hindi and related languages, where ergative Case is restricted to the perfective aspect:

- (1) a. Ram-ne gari cala-ta (hai). [Hindi/Urdu]
 Ram-ERG car drive-PERFECTIVE be.PRES
 ‘Ram has driven a/the car.’

* I would like to thank the audience at DEAL II at the University of Leiden for their valuable comments and discussion. I would also like to thank those who did the fieldwork to gather the interesting and important data used in this paper.

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- b. Ram gari cala-yi (hai).
 Ram.NOM car drive-**IMPERFECTIVE** be.PRES
 ‘Ram drives/is driving a car.’ (Butt and Deo 2005 (6-7))

The task of accounting for aspect splits has been largely left to those linguists who work on a language that happens to manifest such a split. The few accounts that have been proposed are designed for one type of aspect split, and these accounts do not easily extend to other types of aspect splits in other language families. Aspect splits are not limited to Case, nor do they have any inherent connection to ergativity. Aspect splits can involve agreement (Yucatec Maya), and even preposition insertion (Palauan).

The goal of this paper is to develop a general theory of aspect splits, one which addresses not only the question of exactly how such splits are produced by the formal grammar, but also the functional question of why they occur at all.

Taking the functional question first, I argue that aspect splits have an interesting and important function. Aspect splits provide an economical way of marking (or redundantly marking) aspect without adding anything to the clause. Instead, they mark aspect indirectly by blocking the use of an otherwise expected element in one aspect. I call this phenomenon *Parasitic Marking*. A real life example of Parasitic Marking is the ‘shirts and skins’ method that boys use to mark team membership when they play sports informally without uniforms: the boys on one team remove their shirts, while the boys on the other team keep their shirts on. The presence of an ordinary shirt thus comes to mark one team, while its absence marks the other team.

Parasitic marking is economical because it never adds anything. Parasitic marking is parasitic because it involves manipulating the distribution of some independent element which has no inherent connection with what is being marked.

Parasitic marking in language is not quite as perfect as in the shirts and skins example, where the distribution of shirts is manipulated for both teams. In linguistic examples, it is as if one team removes their shirts, but the members of the other team do nothing (and may or may happen to be wearing a shirt). That is, in parasitic marking in language, an element is blocked in one context (e.g. one aspect), but unaffected in the opposite context. For example, in Hindi, ergative Case is prohibited in the imperfective aspect, but the distribution of Cases in the perfective aspect is unaffected. The presence of ergative Case is a reliable indicator of perfective aspect in Hindi because ergative Case is only allowed in the perfective aspect; yet, the absence of ergative Case does not, by itself, reliably indicate imperfect aspect: it is only when ergative Case fails to occur on the subject of a verb that is known to license ergative Case that one can reliably conclude that the aspect is imperfective in Hindi.

Though imperfect, parasitic marking is cheap since it never involves adding anything, and instead involves removing some element, often a marked element. Sometimes aspect is only marked parasitically in a language, in at least some contexts, but in other situations, the parasitic marking of aspect by an aspect split only redundantly marks aspect. This is what occurs in Hindi where aspect is marked with aspect morphemes as well.

Turning now to the formal grammar of aspect splits, I will argue that the formal means for producing aspect splits already exists in the linguistics literature, just not in the syntax literature, but rather in the phonological literature. Although they are not called splits, similar contextual restrictions are observed in phonology. A well-known example is the situation in which [+voice] consonants are prohibited in codas but allowed in syllable onsets. Phonology has a means of analyzing such contextual restrictions using Optimality Theory (Prince and Smolensky 1993, 2004). This phenomenon is analyzed in Beckman 1998 as involving positional faithfulness; that is, [+voice]

is protected in syllable onsets from the effect of a general ban on [+voice] consonants that applies elsewhere. However, the contexts that may be involved in such ‘splits’ are not limited to positions: Smith 2001 shows that the protected environment can be nouns, as opposed to verbs. Thus I will use the more general term, *contextual faithfulness*, to refer to this phenomenon.

In contextual faithfulness, a contextually restricted version of an independently motivated faithfulness constraint protects a marked element from an opposing markedness constraint that would otherwise eliminate it. I extend this approach to the aspect split in Hindi by formulating a contextually restricted version of the independently motivated faithfulness constraint that preserves ergative Case, established in Woolford 2001, 2007. The contextually restricted version of this constraint preserves ergative Case only in the perfective aspect. Elsewhere, the (very marked) ergative Case is eliminated by the markedness constraint *ERGATIVE.

Those readers who do not work in Optimality Theory may be thinking that a better approach would be to simply place a language-specific condition on the head that licenses ergative Case in Hindi. In fact, such an approach is proposed for Hindi in Davison 2004. Under her account, the aspect head licenses ergative Case in Hindi, and only if that aspect head has the feature [+perfective]. The problem is that this approach makes the wrong prediction when it comes to the behavior of overlapping splits in related languages. Nepali is like Hindi in allowing ergative Case in the perfective aspect, but Nepali also has an overlapping split such that ergative Case is allowed with individual-level predicates, regardless of the aspect of the clause (Butt and Poudel 2007). The pattern of overlapping splits is additive, as predicted by the contextual faithfulness approach: an element can be preserved in two overlapping contexts by the combined effect of two different contextual faithfulness constraints.

We will see another overlapping split pattern in Mayan languages. Yucatec Maya has an aspect split involving agreement, which is restricted to intransitive clauses. The related language Chontal has this same pattern overlaid with another agreement split in positive vs negative clauses, which is also neutralized in transitive clauses (Knowles-Berry 1987). I argue that these patterns involve contextually restricted DEP constraints, in contrast to the Hindi/Nepali patterns which involve contextually restricted IDENT constraints. This is because agreement is not present in the input to syntax proper (the argument structure level or vP phase), in contrast to ergative Case (inherent Case) which is licensed at that prior level. DEP constraints prohibit elements that are not present at the prior level. The additive effect of two DEP constraints is the opposite of the additive effect of two IDENT constraints: the context in which agreement is allowed is reduced instead of increased. As for the odd restriction of these splits to intransitive clauses, this falls out automatically in this OT approach.

The third aspect split to be discussed in this paper occurs in Palauan. This split involves the way that ‘marked objects’ are marked: Palauan uses preposition insertion in the imperfective aspect, but object shift (with resulting clitic doubling) in the perfective aspect. Because inserted prepositions are not present in the input to syntax proper, this split is also governed by a contextually restricted DEP constraint.

All three of these aspect splits are produced by contextually restricted faithfulness constraints, and the context is always [+perfective].

This paper is organized as follows. Section 1 presents the data and analysis of the aspect split in Hindi. Supporting evidence from the interacting split in Nepali is presented in section 2. Section 3 deals with the aspect split in Palauan where aspect determines how ‘marked objects’ are to be marked. Palauan shows that aspect splits are not confined to ergative languages. In

addition, Palauan is a language in which the perfective aspect is never marked in Palauan by an aspect morpheme, but only marked by the parasitic marking of this aspect split. In section 4, we turn to the aspect split involving agreement in Yucatec Maya. The analysis of this split is complicated by a controversy over whether the Mayan languages have a covert ergative Case system. I will give two solutions, one assuming a nominative-accusative abstract Case system and one assuming an ergative system. The general form of the solutions is similar. Section 5 is a discussion of typological predictions of the contextual faithfulness approach to aspect splits proposed in this paper.

2 The Ergative Aspect Split of Hindi

In Hindi and many related languages, ergative Case is limited to the perfective aspect (e.g. DeLancey 1981, Butt and Deo 2005).¹

- (2) a. Ram-ne gari cala-ta (hai). [Hindi/Urdu]
 Ram-ERG car drive-PERFECTIVE be.PRES
 ‘Ram has driven a/the car.’
- b. Ram gari cala-yi (hai).
 Ram.NOM car drive-IMPERFECTIVE be.PRES
 ‘Ram drives/is driving a car.’ (Butt and Deo 2005 (6-7))

Perfective aspect does not license ergative Case however. Ergative Case is licensed cross-linguistically by verbs that take an external argument.² Languages

¹ I have omitted gender and number in the glosses of these Urdu/Hindi examples.

² Ergative is an inherent Case, as the dative is, and inherent Cases are licensed in connection with theta-licensing at the vP phase or argument structure level that precedes syntax proper. Ergative Case is licensed by the head that licenses external arguments (Woolford 2006). Agents are always external arguments, but subjects with a range of other theta-roles are also mapped to the external argument position, with the exact range depending on the language (Woolford 2006). Not all subjects are external arguments. Hindi also has experiencer subjects marked with dative Case, and theme/unaccusative subjects marked with nominative Case.

such as Basque mark all external arguments with ergative Case, but Hindi and many related languages restrict this Case to the perfective aspect.

The question is, how is this aspectual restriction encoded in the formal grammar? The kinds of answers one might propose depend on one's assumptions about how cross-linguistic differences are coded in general. Narrowing the question to cross-linguistic differences involving Case, many frameworks assume that if a particular language such as English lacks ergative Case, it is either because the lexicon lacks an ergative Case morpheme (the lexical gap approach) or that the head that licenses ergative Case (little *v*) lacks that ability in the language in question (the licensing approach). Since ergative Case clearly exists in Hindi, the lexical gap approach will not help here, but an account of the Hindi aspect split using the licensing approach has been proposed by Davison 2004, who argues that the aspect head licenses ergative Case in Hindi, if it carries the feature [+perfective]. As it stands, this approach overgenerates since it would allow any verb to take an ergative subject in the perfective aspect; however, one could modify this approach to overcome this problem, say by requiring little *v* to combine with an aspect head carrying the feature [+perfective] in Hindi (but not in Basque) in order to license ergative Case. The real problem with this approach is the fact that it maintains that ergative Case cannot be licensed in the imperfective aspect in languages that manifest this aspect split, but this is inconsistent with Nepali. As we will see in section 2, Nepali shares this aspect split, but nonetheless ergative Case can be used in one context in the imperfective aspect in Nepali, because of the presence of an additional overlapping ergative split of a different kind.

In the approach to Case that I have developed (Woolford 2001, 2006, 2007) ergative Case is potentially licensed by little *v* in any language; there are no language-specific differences in the Case licensing abilities of syntactic

heads.³ Instead, in situations where there is more than one Case that could be licensed on a particular argument, the choice is determined by the relative ranking of a small set of universal, but violable markedness and faithfulness constraints. Markedness constraints simply rule out the more marked Cases, e.g. *ERGATIVE. Faithfulness enters the picture when inherent Case is involved because inherent Cases are licensed at a level prior to that of syntax proper (the CP phase); that prior level can be called the argument structure level or the vP phase. It has been a part of syntactic theory since Chomsky 1981 that inherent Cases are licensed at a level prior to the level where structural Cases are licensed; but it was also assumed that any Case licensed at this prior level had to be preserved. In OT terms, the assumption was that faithfulness to inherent Cases was inviolable. What I alter is this assumption of inviolability. The violable faithfulness constraint IDENT(ergative) preserves all instances of ergative Case at the level of syntax proper, while the marked constraint *ERGATIVE removes them all. The relative ranking of these two constraints alone produces languages such as Basque where all external arguments get ergative Case, and languages such as English where the ergative Case is discarded in favor of the less marked nominative. But these two extremes are not the only ergative patterns that occur. In Woolford 2007, I discuss a ‘last resort’ use of ergative Case in languages that have the English ranking above and normally manifest a nominative-accusative pattern. In such languages, a higher ranking Case locality constraint is relevant when object shift occurs, and it favors the preservation of ergative Case.

In Hindi, we have another situation in which only some ergatives are preserved. Following work on OT phonology such as Beckman 1998 on contextually

³ The exception to this is the few truly idiosyncratic lexical Cases that are selected only by a few verbs for their theme argument. (See Woolford 2006 for a discussion of the difference between the more predictable inherent Cases and the unpredictable lexical Cases.)

restricted faithfulness, I propose that the aspect split in ergative Case in Hindi is the result of the following contextually restricted version of the IDENT (ergative) constraint. This faithfulness constraint preserves ergative Case in the perfective aspect:

- (3) IDENT_{perfective} (erg) Preserve ergative Case in the perfective aspect.

This constraint will produce the Hindi aspect split if it is ranked above the markedness constraint that eliminates ergatives, which is, in turn, ranked above the general faithfulness constraint that preserves all ergatives. This ranking will preserve ergative Case in the perfective aspect, but eliminate ergatives in any other context (unless some additional high ranking constraint intervenes):

- (4) Hindi constraint ranking

IDENT_{perfective} (ergative) >> *ERGATIVE >> IDENT (ergative)

These constraints apply in syntax proper (or the CP phase), whose input is the argument structure level (or the vP phase). The tableau below shows that the high ranking contextually restricted faithfulness constraint eliminates any candidate that does not preserve an ergative Case from this input level. (I ignore here candidates with other structural Cases; see Woolford 2001).⁴

- (5) An External Argument in the Perfective Aspect in Hindi

input: DP-ergative	IDENT _{perfective} (erg)	*ERGATIVE	IDENT (erg)
☞ a. DP-ergative		*	
b. DP-nominative	*!		*

For internal arguments, which are never licensed for ergative Case, this high ranking faithfulness constraint does nothing, and the markedness constraint,

⁴ In situations where there is a choice of structural Cases that can be licensed on a subject, markedness constraints such as *accusative remove all but the least marked of these (Woolford 2001).

*ERGATIVE, (or the general ban on unlicensed Cases) rules out any candidate to which ergative Case has been added.

(6) An Internal Argument in the Perfective Aspect in Hindi

	input: DP-	IDENT _{perfective} (erg)	*ERGATIVE	IDENT (erg)
	a. DP-ergative		*!	
☞	b. DP-nominative			*

In the imperfective aspect, the contextually restricted constraint also has no effect, but for a different reason: the context is not satisfied. But the result is the same: *ERGATIVE eliminates all candidates containing an ergative Case.

(7) An External Argument in the Imperfective Aspect in Hindi

	input: DP-ergative	IDENT _{perfective} (erg)	*ERG	IDENT (erg)
	a. DP-ergative		*!	
☞	b. DP-nominative			*

Although this OT approach is fairly simple and captures similarities between syntax and phonology, given the data accounted for so far, one could argue that this OT approach does not really outperform an approach in which these cross-linguistic differences in Basque, English, and Hindi result from (parametric) differences in the licensing capabilities of little *v* (the head that licenses external arguments and ergative Case). One could say, for example, that English little *v* lacks this ergative Case licensing capability, but the Basque little *v* has it, and the Hindi little *v* has it only when the feature [+perfective] is present.⁵ As this paper progresses, we will see a series of language examples to

⁵ The ‘parametric licensing’ approach described here is similar to that proposed for Hindi in Davison 2004, except that she treats ergative Case as a structural Case licensed by the aspect head when it carries the feature [+perfective].

which it would be difficult, if not impossible, to extend such a parametric licensing approach. The first of these occurs in Nepali.

3 Nepali and Overlapping Splits

Nepali shares the aspect split just described for Hindi, but Nepali also has another cross-cutting split involving ergative Case. Nepali allows ergative Case, even in the imperfect aspect, when the predicate is individual-level (as opposed to stage-level); Butt and Poudel (2007) illustrate this additional ergative split in Nepali with the following examples. In (8), the fact that Ram knows English is a property of Ram (individual-level); it is not confined to a particular stage of time. Here Ram takes ergative Case even though the aspect is imperfective.

- (8) Raam-le (#aajaa) angreji jaan-da-cha. [Nepali]
 Ram-ERG today English know-IMPF-NONPAST.MASC.3.SG
 ‘Ram knows English (#today).’ (Individual-level predicate)

In contrast, the event of Ram speaking in (9) will occur in one particular stage of time and thus the predicate is stage-level. Here Ram does not take ergative Case.

- (9) Raam (aajaa) angreji bol -da-cha. [Nepali]
 Ram today English speak -IMPF-NONPAST.MASC.3.SG
 ‘Ram will speak English (today).’ (Stage-Level predicate)

Thus Nepali has two overlapping ergative splits. Moreover, the effects of these splits are additive, so that ergative Case is preserved in all contexts except in stage level predicates in the imperfective aspect:

(10) Overlapping Additive Ergative Splits in Nepali

	perfective aspect	imperfective aspect
individual level	Ergative	Ergative
stage level	Ergative	no ergative

This pattern is the result of ‘adding up’ the contexts in which ergative Case is allowed under each of these two splits.

This additive pattern is unexpected under Davison’s account of the aspectual split in Hindi, because it maintains that ergative Case is not licensed in the imperfective aspect. One might be able to accommodate a cross-cutting split that further reduced the contexts in which ergative Case is licensed, but the additive pattern we see in Nepali, where the contexts in which ergative Case occurs increases, is unexpected.

In contrast, this additive pattern is just what we expect if such splits are the result of contextually restricted faithfulness constraints. These constraints state a context in which ergative Case must be preserved. When there are two such constraints that are active in a language, there will be two contexts in which ergative Case is preserved.

These constraints preserving ergative Case will be active in a language if they are ranked above *ERGATIVE. The formulation of these constraints is the same except for the context restriction. Both are IDENT constraints, requiring identity between the input and output levels. Here the output level is syntax proper (the CP phase), and its input is the argument structure level or vP phase where ergative Case is licensed.

(11) IDENT_{perfective}(ERG) Preserve ergative Case in the perfective aspect.

(12) IDENT_{individual-level}(ERG) Preserve ergative with individual-level predicates.

Not all splits involve ergative Case however. In the next section we turn to Palauan, a language which manifests a very different sort of aspect split involving preposition insertion.

4 The Aspect Split in Marked Objects in Palauan

Palauan (Austronesian) also manifests an aspect split between the perfective and imperfective aspect; but the Palauan aspect split is very different from what we see in Hindi and Nepali. The Palauan split involves choosing between two different ways of marking ‘marked objects’, with the choice being determined by aspect. Marked objects are a well-known typological phenomenon in which objects with particular features (e.g. specific, human) are ‘marked’ in one of several ways. They can be marked with an inserted preposition, as in Spanish, or they can move out of the VP, often with a concomitant change in Case and/or agreement, as in Turkish and Hindi (Comrie 1989, Woolford 1995, Aissen 2003).⁶

Palauan is unusual in using both of these methods of marking ‘marked objects’ and for selecting between these methods on the basis of aspect. In the imperfect aspect, Palauan follows the Spanish method, ‘marking’ objects that are human and/or individuated (specific and singular) with an inserted preposition:

- (13) A sensei a mengelebed **er** a rengalek. [imperfective aspect]
 teacher hit **P** children
 ‘The teacher is hitting the children.’ (Georgopoulos 1991: 35)

⁶ I put aside here the thorny question of why an object with marked features cannot simply remain morphologically unmarked in its base position. There are two formal proposals within OT for the analysis of marked objects. Building on Diesing 1992, I argue in Woolford 1995 that objects with certain features are disallowed within the VP, just as consonants with certain features are disallowed in coda position in some languages. In that paper, I proposed what are essentially contextual markedness constraints to prohibit objects with such features in their base position inside VP; it might now be preferable to reformulate these constraints as contextual faithfulness. Aissen 2003 takes a very different approach to marked object, formalizing the iconic approach of Silverstein 1976 wherein morphological case serves as a flag to mark an object with features that are atypical for objects. Aissen’s approach uses constraint conjunction to penalize objects with certain features if those objects lack morphological case (where case is interpreted broadly to include prepositions).

In the perfective aspect, Palauan follows the Turkish strategy in that it moves objects with those features out of the VP. Although the Case of the shifted object does not change as in Turkish or Hindi, the fact that the object is no longer in its base position means that it must be clitic-doubled, as in many Romance languages and in Chichewa (Bresnan and Mchombo 1986). The syntactic clitic is suffixed to the verb:

- (14) Ak mils-**terir** a retede el sensei. [perfective aspect]
 I saw-**3.PL.CLITIC** three teacher
 ‘I saw three teachers.’ (Josephs 1975: 43)

In contrast, objects that are neither human nor individuated (specific and singular) remain ‘unmarked’ in their base position.

- (15) Ng- milengelebed a bilis.
 3sg- IMPERF.hit dog
 ‘He/she hit a dog /the dogs /some dogs.’ (Georgopoulos 1991: 29)

Both movement and preposition insertion are ‘last resort’ operations. When they are not needed, they are not used, because both have a ‘cost’. This cost in OT terms is a violation of the constraints that prohibit them. Movement violates *TRACE or STAY (Grimshaw 1997).⁷ Preposition insertion violates a DEP constraint, DEP (P).

- (16) DEP (P) No preposition insertion.
 A preposition in the output must be present in the input.

DEP constraints, developed in OT phonology, require that the output depend on the input; that is, nothing can be inserted in the output that is not already present in the input. The relative ranking of *TRACE and DEP (P) determines the basic

⁷ In more recent work, Grimshaw 2006 argues that the *trace (*t) or STAY constraint may not be needed because (simplifying here) movement usually creates additional structure which leads to additional violations of independently motivated constraints.

preference in a language among these two ‘last resort’ options (or in Minimalist terms, which is last resort and which is last last resort).

The situation in Palauan is more complex because aspect determines which of these ‘last resort’ devices will be used to ‘mark’ a marked object. I argue that there is a contextually restricted version of the faithfulness constraint DEP (P), whose application is limited to the perfective aspect.

(17) DEP_{perfective} (P) No preposition insertion in the perfective aspect.

This DEP constraint prevents preposition insertion in the perfective aspect. However, it has no effect on base-generated prepositions. Base generated prepositions occur in both aspects in Palauan. In the following example, we see a base-generated preposition in a perfective clause. This clause does not use an inserted preposition for the marked object because the aspect is perfective:

(18) Ak mils-a a Droteo er a party. [perfective]
 I saw-3.sg.clitic Droteo at party.
 ‘I saw Droteo at the party.’ (Josephs 1975, p. 324)

What remains is to rank these constraints properly to produce the pattern we observe in Palauan. I claim that Palauan is like Spanish in that there is a general preference for using preposition insertion to ‘mark’ objects (*TRACE >> DEP (P)), but preposition insertion is blocked in the perfective aspect by the higher ranked contextually restricted version of this DEP constraint:

(19) Palauan Constraint Ranking

DEP_{perfective} (P) >> *TRACE >> DEP (P)

Let us look at some tableaux to see how these constraints, in this ranking, produce the Palauan pattern. Let us first look at what happens with a human object in the perfective aspect. This object is prohibited from simply remaining in the VP by a higher ranking constraint not discussed here which requires

human objects to be ‘marked’ in some way. The tableau shows candidates with the two possible ways of ‘marking’ such objects, inserting a preposition (candidate a) or moving the object out of the VP (with associated clitic doubling) in candidate b. With a clause in the perfective aspect, insertion of a preposition is barred by the highest constraint shown in the tableau, eliminating candidate a. This leaves candidate b as the winner.

(20) Pattern for a human object in the perfective aspect

input: ... V DP _[+human]	DEP _{perfective} (P)	*TRACE	DEP (P)
a. ... V [P DP]	*!		*
☞ b. ... DP V-cl t		*	

Now let us turn to what happens to human objects in imperfective clauses. In the imperfective aspect, DEP_{perfective} (P) has no effect. The decision is made by the next highest constraint, *TRACE, which rules out candidate (b) where the object has moved out of the VP. This leaves candidate (a), with preposition insertion, as the winner:

(21) Pattern for Human Objects in the Imperfective Aspect

input: ... V DP _[+human] imperfective aspect)	DEP _{perfective} (P)	*TRACE	DEP (P)
☞ a. → ... V [P DP]			*
b. ... DP V-cl t		*!	

To sum up this section, the aspect split in Palauan can be analyzed like the aspect split in Hindi, in the sense that both involve contextually restricted versions of an independently motivated faithfulness constraint. Moreover, the context that is specified in both languages is [+perfective]. The languages differ only in which type of faithfulness constraint is involved, IDENT or DEP, and what these constraints apply to, ergative Case or prepositions.

From a functional point of view, this parasitic marking of aspect in Palauan is the only way that aspect is marked in the perfective. And unless a marked object is involved, perfective aspect is not marked at all. In the imperfective aspect, there is an aspect morpheme, so the parasitic marking of aspect by preposition insertion marks aspect redundantly.

We will now turn to the third type of aspect split to be discussed in this paper, a split that involves agreement in Yucatec Maya. I will argue that this split is the result of a DEP constraint that applies to agreement.

5 Yucatec Maya

Yucatec Maya also manifests an aspect split, but this one involves agreement. There is an additional complication in that this aspect split is limited to intransitive clauses (Nida and Romero 1950, Bricker 1981, Krämer and Wunderlich 1999, Bohnemeyer 2004).

Let us begin with transitive clauses for comparison, and to get an idea of what the basic agreement pattern looks like. In both aspects, the subject of a transitive clause is cross-referenced with an agreement series traditionally labeled ‘Set A’, while the object is cross-referenced with a form from ‘Set B’. The use of these neutral labels is related to the fact that there is a controversy as to whether the Mayan languages are ergative or not. Fortunately, the formal analysis of the aspect split that I will propose is not crucially affected by this controversy. At the end of this section, I will show how the analysis would differ if Yucatec Maya is ergative, but I will assume until then that it is an ordinary nominative-accusative language, cross-referencing its transitive arguments much as in Romance languages, with true agreement for subjects and syntactic clitics for objects. I have reglossed the ‘Set A’ and ‘Set B’ forms accordingly. The true agreement forms (Set A) precede the verb and attach either to a higher

functional node, or prefix to the verb. The syntactic clitics (Set B) suffix to the verb. As we see in the following transitive examples, the pattern is the same in both the perfective and imperfect aspect:

- (22) Táan uy- il -ik -en [imperfective aspect]
 DUR 3rdAGR-see-IMPERF-1stCL
 ‘He is seeing me.’ (Bricker 1981 (1), reglossed)

- (23) T- inw- il- ah -eč [perfective aspect]
 COMPL- 1stAGR-see-PERF-2ndCL
 ‘I saw you.’ (Bricker 1981 (2), reglossed)

Intransitives in the imperfective aspect cross-reference their subjects in the same way as transitive clauses, with true agreement (Set A), regardless of what verb is used.

- (24) Táan in- k’uč -ul. [imperfective aspect]
 DUR 1stAGR-arrive-IMPERF
 ‘I am arriving.’ (Bricker 1981 (4), reglossed)

- (25) K -in meyah. [imperfective aspect]
 INCOMPL -1stAGR work
 ‘I am working.’ (Krämer and Wunderlich 1999 (1c), reglossed)

The surprise comes when one examines intransitives in the perfective aspect. Here, we see the manifestation of the aspect split: all intransitive subjects are cross-referenced by syntactic clitics (Set B forms) in the perfective aspect.

- (26) H- k’uč -ø -eč [perfective aspect]
 COMPL- arrive-PERF -2ndCL
 ‘You arrived.’ (Bricker 1981 (4), reglossed)

- (27) H- meyah-n-ah -en
 COMPL work-N -PERF -1stCL
 ‘I have worked.’ (Krämer and Wunderlich 1999 (1d), reglossed)

We thus need to account for two different dimensions of this pattern, the aspect split itself, and the fact that this aspect split is neutralized in transitive

clauses. Let us begin with the transitivity effect, because it is the result of independent factors.

5.1 Why the Aspect Split is Neutralized in Transitives

To understand why the aspect split in Yucatec Maya is neutralized in transitive clauses, we need to return to the big picture discussion in the introduction of this paper regarding the nature of parasitic marking. Parasitic marking is possible only when the grammar allows a choice of elements in a particular context, so that parasitic marking can manipulate this choice in order to code something independent, such as aspect. In Hindi, the aspect split manipulates the choice between ergative and nominative Case for a subject in order to parasitically mark aspect; but for verbs that cannot license ergative Case to begin with, the aspect split is neutralized. In Palauan, aspect manipulates a choice of ways to deal with ‘marked objects’; in clauses where there is no object, or the object has unmarked features, parasitic marking of aspect is not possible. Thus the short answer to why the aspect split in Yucatec Maya is neutralized in transitive clauses is that there is no choice as to which series to select when cross-referencing a transitive subject.

Why is there no choice of cross-referencing forms for transitive subjects? The answer has to do with the nature of these cross-referencing forms and independent constraints on their use. (I will give an answer here based on the assumption that Yucatec Maya has a nominative-accusative abstract Case system, and that the Set A forms are true agreement and the Set B forms are syntactic clitics.) In a language with a nominative-accusative Case system, true agreement is restricted to nominatives/subjects. Thus in a transitive clause, there are only two options: either the subject is cross-referenced by true agreement and the object is cross-referenced by a syntactic clitic, or else both arguments are cross-referenced with syntactic clitics. The second option is ruled out in

Mayan languages because syntactic clitics are limited to one per clause. (This limitation is seen in other languages such as Chichewa and Selayarese.) That leaves only one option for the cross-referencing pattern of transitives in Yucatec Maya, the pattern we see: true agreement with the subject and a syntactic clitic cross-referencing the object.

The interesting question becomes then, why is there a choice of cross-referencing forms for an intransitive subject? The answer is that syntactic clitics are not limited to objects. Syntactic clitics can potentially cross-reference any argument (although they must match that argument in (abstract) Case). Although we don't see nominative clitics in languages that always use true agreement to cross-reference subjects, they do exist cross-linguistically. I argue that the syntactic clitics in Yucatec Maya (Series B), although they are not morphologically marked for Case, actually include forms with both nominative and accusative abstract Case.

Given this choice of cross-referencing forms that the grammar allows for intransitive subjects, parasitic marking can exploit this choice in order to code aspect.

5.2 The Formal Account of the Aspect Split in Yucatec Maya

In intransitive clauses, there is only one argument to cross-reference, but two series of cross-referencing elements to choose from, true agreement and syntactic clitics. Many familiar languages always choose true agreement. In those languages, there is a preference for using true agreement rather than a syntactic clitic, whenever possible. This preference is encoded in the constraint ranking that places the markedness constraint prohibiting syntactic clitics higher than the markedness constraint that prohibits true agreement: *CLITIC >> *AGREE. I argue that Yucatec Maya shares this basic ranking, but that there is a

higher ranked, contextually restricted DEP constraint in Yucatec Maya that prohibits the use of true agreement in the perfective aspect.

5.3 The Effect of DEP Constraints on Cross-referencing Elements

DEP constraints block insertion. That is, they prohibit the use of any element that was not present at (does not have a correspondent at) the prior level. We saw above that DEP (P) blocks inserted prepositions, but it leaves base-generated prepositions alone. But agreement is different than prepositions; in a sense all cross-referencing elements are inserted. That is, neither true agreement nor syntactic clitics are present in the input to syntax proper (the argument structure level or vP phase) , but are instead inserted or merged in syntax proper (the CP level). So what happens when a DEP constraint applies to an element that is always inserted? In this situation, a DEP constraint acts like a markedness constraint that simply blocks all instances of the element. The constraint we need to produce the aspect split in Yucatec Maya is one that will block all instances of true agreement in the perfective aspect. The contextually restricted DEP constraint in does this:

- (28) $DEP_{\text{perfective}}(\text{Agr})$ Agreement in the perfective aspect
 must have a correspondent in the input.

5.4 Constraint Raking and Tableaux

The following constraint ranking produces the aspect split in Yucatec Maya:

(29) Yucatec Maya Constraint Ranking

$DEP_{\text{perfective}}(\text{Agr}) \gg *CLITIC \gg *AGREE$

I also assume that there is a high ranking constraint (XREF) that requires all arguments to be cross-referenced.

Let us consider the effect of these constraints on intransitives in the perfective aspect. The input contains a verb and its one argument, but no cross-

referencing elements. Candidate (a), which adds no cross-referencing element, violates XREF, and is eliminated. Candidate (b) has a cross-referencing element, true agreement, but because the context is the perfective aspect, using true agreement is ruled out by DEP_{perfective} (Agr). That leaves candidate (c) with a syntactic clitic as the winner, even though it violates a lower ranked constraint, *CLITIC:

(30) Intransitives in the Perfective Aspect

Input: perfective V DP	XREF	DEP _{Perf} (Agr)	*CLITIC	*AGREE
a. V DP	*!			
b. Agr V DP		*!		*
☞ c. V Clitic DP			*	

Now, let us turn to the imperfective aspect. Here, the (a) candidate is eliminated for the same reason. But here the DEP constraint has no effect because the aspect is not perfective. So candidates (b) and (c) are still in the running. But *CLITIC then eliminates candidate (c) which has a syntactic clitic. This leaves candidate (b) with agreement as the winner.

(31) Intransitives in the Imperfective Aspect


Input: V DP	XREF	DEP _{Perf} (Agr)	*CLITIC	*AGREE
a. V DP	*!			
☞ b. Agr V DP				*
c. V Clitic DP			*!	

For completeness, let us examine the situation in transitive clauses. To simplify things, let us put aside all candidates that violate XRef because one or both of the arguments are not cross-referenced. There are only two possibilities for cross-referencing both arguments: one is to use two syntactic clitics, and the other is to use true agreement for the subject and a syntactic clitic for the object. The other two logical possibilities are ruled out under the assumption that I

maintain here that there is no true ‘object’ agreement and true (‘subject’) agreement can only cross-reference the nominative/subject. What makes the decision between the only two possible candidates in transitive clauses is an independently motivated constraint that prohibits more than one syntactic clitic per clause.⁸ I will refer to this constraint here (descriptively) as ‘limit one clitic’.⁹

In a transitive clause in the perfective aspect in Yucatec Maya, this ‘limit one clitic’ constraint outranks the contextually restricted dep constraint that would prohibit the use of true agreement in the perfective aspect. Thus the candidate in (a) with two syntactic clitics is eliminated before the contextually restricted DEP constraint has a chance to have an effect:

(32) Transitive (perfective aspect)

Input: ... V DP DP	Limit one clitic	DEP _{Perf} (Agr)	*CLITIC	*AGREE
a. ... V-CL-CL DP DP	*!		**	
 b. ... Agr-V-CL DP DP		*	*	*

The same candidate wins in the imperfective aspect as well, and this is why the aspect split is neutralized in transitives.

Now let us turn to a related language that combines the aspect split of Yucatec Maya with a cross-cutting negative split.

6 A Negative Split in the Related Language Chontal

Chontal is a Mayan language with the same aspect split that Yucatec Maya has, but Chontal also has an overlapping negative split. Chontal cannot use

⁸ Other Mayan languages limit syntactic clitics to one per clause, as does Selayarese (See Woolford 2003)

⁹ I have argued elsewhere that this limit of one syntactic clitic per clause is due to the fact that only one syntactic clitic can be perfectly aligned to some edge (whatever edge it is that clitics align to in the particular language).

agreement in negative intransitives, regardless of the aspect (Knowles-Berry 1987). We see this Chontal negative split in the following imperfective examples, where agreement is used in the positive form, but a clitic is used in the negative:

- (33) Ki t -e. [Chontal]
 1stAGR come -IMPF
 ‘I come.’ (Knowles-Berry 1987 (67), reglossed)

- (34) Mač ʔu t -on.
 NEG PT come -1stCL
 ‘I don’t come.’ (Knowles-Berry 1987 (68), reglossed)

The pattern that these two overlapping agreement splits produce in Chontal is shown in the table below:

(35) The Intransitive Pattern in Chontal

contexts	Positive	Negative
Perfective	syntactic clitic	syntactic clitic
Imperfective	agreement	syntactic clitic

This pattern is the result of the additive effect of two contextually restricted DEP constraints. One is the same as we saw above in Yucatec Maya; it blocks true agreement in the perfective aspect. The other blocks true agreement in negatives:

(36) Contextually Restricted DEP Constraints Active in Chontal

DEP _{perfective} (Agr)	Blocks agreement in perfective clauses ¹⁰
DEP _{neg} (Agr)	Block agreement in negative clauses

6.1 Why the Additive Patterns in Chontal and Nepali are Different

Unlike the situation in Nepali, where the two splits combined to *increase* the contexts in which ergative Case occurs, the two Chontal splits combine to *decrease* the contexts in which true agreement occurs. This difference is predicted by the nature of the elements involved in these splits, in combination with the nature of the contextually constrained faithfulness constraints that produce these splits.

Ergative Case is an inherent Case, present in the input to syntax proper, and the constraints that produce the two ergative splits in Nepali are IDENT constraints which preserve this inherent Case in syntax. The additive effect of two constraints that preserve the ergative Case in some context is to preserve ergative Case in more contexts, as we saw in Nepali.

In contrast, the splits in Chontal involve true agreement, which is *not* present in the input to syntax proper. The faithfulness constraints that produce the two agreement splits in Chontal are DEP constraints, which prohibit any agreement in syntax that was not present in the input, and thus prohibit all agreement in syntax. The additive effect of two DEP constraints that prohibit agreement in some context is to prohibit agreement in *more* contexts.

¹⁰ The technical effect of these DEP constraints is to require any use of agreement in syntax proper to have a correspondent in the input to syntax. Since agreement never has a correspondent in the input to syntax (which I take to be the vP phase or the argument structure level), the actual effect is to block all agreement.

6.2 Chontal Constraint Ranking and Tableaux

The two DEP constraints that block agreement in Chontal are active because they are both ranked above the markedness constraint *CLITIC which blocks the alternative to agreement, syntactic clitics. Like Yucatec Maya, Chontal requires all arguments to be cross-referenced in syntax; a high ranked XREF constraint enforces this. Thus, when true agreement is blocked in some context, a syntactic clitic must be used instead.

We see the action of these constraints for a negative intransitive in the imperfective aspect in the tableau below. XREF eliminates candidate (a), the candidate with no cross-referencing at all. Because the example is in the imperfective aspect, the DEP constraint that applies in the perfective aspect does nothing. The DEP constraint that applies in negative contexts does apply, eliminating candidate (b) because it has true agreement. This leaves candidate (c) with a syntactic clitic cross-referencing the intransitive subject as the winner. The decision is made before the lower ranked *CLITIC has a chance to apply.

(37) Chontal Intransitives (negative, imperfective aspect)

input: neg V DP imperfective aspect	XRef	DEP _{perf} (AGR)	DEP _{neg} (AGR)	*CLITIC	*AGREE
a. neg V DP	*!				
b. neg Agr V DP			*!		*
☞ c. neg V-CL DP				*	

The tableau for a positive intransitive in the perfective aspect is similar, except that it is the DEP_{perf}(AGR) constraint that eliminates candidate (b) with agreement.

In positive intransitives in the imperfect aspect, neither DEP constraint applies. The decision between candidates (b) and (c) is thus made by the lower ranked *CLITIC, which eliminates the candidate with a syntactic clitic in (c), leaving the candidate in (b) with true agreement as the winner.

(38) Chontal Intransitives (positive, imperfective aspect)

input: V DP imperfective aspect	XRef	DEP _{perf} (AGR)	DEP _{neg} (AGR)	*CLITIC	*AGREE
a. V DP	*!				
☞ b. Agr V DP					*
c. V-CL DP				*!	

Let us now turn to transitives in Chontal.

6.3 Neutralization of Splits in Transitives in Chontal

Transitives in Chontal work exactly as in Yucatec Maya. The effect of both splits is neutralized in transitives, for the same reason. Let us look at this effect again in detail with a tableau.

For the reasons given in the discussion of Yucatec Maya above, the theory allows only two possible patterns for cross-referencing both the subject and object in a clause with a nominative-accusative (abstract) Case pattern.¹¹ The violable ranked constraints are thus limited to selecting between these two options. As in Yucatec Maya, the ‘limit one clitic’ constraint is high ranking, and makes the decision before either of the split-producing DEP constraints have a chance to act.

(39) Transitive (perfective aspect)

Input: neg V DP DP	Limit	DEP _{Perf} (Agr)	DEP _{neg} (AGR)	*CLITIC
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¹¹ If the Mayan languages actually have a covert abstract ergative Case system, as is usually assumed in the literature, the account of these splits would have the same formal character, although the details of the identity of the forms and the exact formulation of the contextually restricted DEP constraints would change. The assumption that Mayan languages have covert ergative Case systems is based on the fact that the surface pattern of agreement in most Mayan languages fits the typological definition of an ergative pattern, and it is commonly assumed that this is not possible unless the abstract Case system is ergative. However, that common assumption is incorrect. In Woolford 2003 I show that a constraint ranking of ‘limit 2 clitics’ >> *agree >> *clitic produces a superficial ergative agreement pattern in a language with a nominative-accusative abstract Case system.

	perfective aspect	one clitic			
	a. neg V-CL-CL DP DP	*!			**
☞	b. neg Agr V-CL DP DP		*	*	*

This neutralization in intransitives depends on the high rank of ‘limit one clitic’, above both dep constraints. This is one of the bits of information that must be learned in the acquisition process. Let us now turn to a discussion of how these bits of information might be conceived of by someone used to thinking about cross-linguistic differences in terms of parameters.

7 Parameters and Constraint Ranking

For those who are used to thinking of cross-linguistic differences in terms of parameters, some of the effects discussed in this paper could be accomplished with parameters that turn constraints on or off in a particular language. For example, one could set the parameter for XREF to ‘on’ in Chontal, but ‘off’ in Chinese, which has no cross-referencing. In Chontal, we could set the parameter for XREF to ‘on’, and the parameter *AGREE to off. But this on/off parameter setting would not do all the work that is needed to account for the patterns we have seen. For example, in Chontal, the constraint *CLITIC is active/on in some contexts, but inactive/off in other contexts.

A different way of thinking about what parameters do is to view parameters as setting the crucial ranking between pairs of constraints. After all, these bits of information are what children learn when they acquire language, according to the OT approach. Moreover, although we necessarily list constraints from left to right in the tableau format, there is no crucial ordering between some constraints; good work in OT phonology includes a chart of the crucial orders among constraints – the orders for which there is empirical evidence in the particular language under discussion.

Under this pair-ordering view of parameter setting, the parameters that a child must set for Chontal with respect to cross-referencing are the following:

(40) Parameter Settings in Chontal (Crucial Constraint Rankings)

- a. *CLITIC >> *AGREE
- b. XREF >> *CLITIC
- c. DEP_{perf}(AGR) >> *CLITIC
- d. DEP_{neg}(AGR) >> *CLITIC
- e. LIMIT ONE CLITIC >> DEP_{perf}(Agr)
- f. LIMIT ONE CLITIC >> DEP_{neg}(Agr)

A slightly different approach to such parameter setting would combine this approach with the on/off view above, so that constraints that are never violated in the language would be set at ‘on’, while constraints that are always violated are set at ‘off’, and settings for crucial rankings would be limited to those constraints that are sometimes obeyed and sometimes violated. Under this view, the parameters for Chontal would be as follows:

(41) Parameter Settings in Chontal

- XRef: on (on = undominated, always obeyed)
- LIMIT ONE CLITIC: on
- *AGREE: off (off = inactive in the language)
- DEP_{perf}(AGR) >> *CLITIC
- DEP_{neg}(AGR) >> *CLITIC

This latter approach may be easier for readers who work in the Minimalist Program to take in, and it might be supported theoretically if it turns out that certain constraints are set at ‘on’ or ‘off’ in the initial state of language acquisition.¹² Using this latter method of expressing the parameters makes it easy to compare the settings for complex patterns in related languages. For

¹² An added dimension/problem for this or any parametric approach which allows constraints/principles to be set at ‘on’ or ‘off’, is that it technically allows conflicting constraints/principles to both be set to ‘on’. However, even if children had both constraints set to ‘on’ at some point in the acquisition process, they would reset one as soon as they observed a situation in which the constraints conflict and one is violated.

example, the parameter settings for Yucatec Maya are just like those for Chontal, except that DEP_{neg} (AGR) is ‘off’, or ranked below *CLITIC .

8 Kinds of Aspect Splits

What kinds of aspect splits does this approach predict should be possible? All of the (aspect) splits discussed in this paper have one thing in common: they all result from the operation of contextually restricted IDENT or DEP constraints.¹³ If this is true in general, then the range of such splits will be determined by the variety of contextually restricted faithfulness constraints that can occur. This is, in turn, predicted by the range of elements that can be ‘plugged in’ to the two variable spots in these contextually restricted faithfulness constraints. One of these variables is the context that the action of the constraint is restricted to, and the other variable is the element that the constraint applies to.

(42) Variables in Contextually Restricted Constraints: context and element

IDENT_{context} (element)

DEP_{context} (element)

The splits we have seen in this paper involve only three types of elements: Case, preposition, and cross-referencing element. The contexts that have been involved include perfective, negative, and stage-level predicate. What additional contexts or elements might be referred to by such constraints remains an open question.

¹³ Some of the splits that are typically mentioned in the typological literature do not occur in syntax; instead, they only affect whether or not a morpheme is spelled out at PF. An example is the fact that ergative Case is not spelled out on first and second person pronouns in Dyrbal. Such PF splits are examples of the classic markedness effect in which a marked feature is not spelled out in the presence of another marked feature. An example of this in English is the fact that gender is spelled out on third person pronouns, but not on first and second person pronouns. See Woolford 2008.

9 Conclusion

In this paper, we have examined three diverse types of aspect splits, one involving Case, one involving agreement, and one involving preposition insertion. I have suggested that the function of such splits is to parasitically mark aspect. By parasitically mark, I mean that these splits never involve the addition of anything to the clause to mark aspect; instead, they involve either the removal of something that would otherwise be in the clause, or the preservation of something from an earlier level that would otherwise be removed from the clause. That is, parasitic marking of aspect involves the manipulation of the otherwise expected distribution of an unrelated element in order to mark aspect.

In formal terms, we can capture this limitation on aspect splits by confining their cause to the same family of constraints that produces similar splits in phonology (e.g. Beckman 1998): contextually restricted faithfulness constraints. These include IDENT constraints which preserve an element (e.g. ergative Case) from the prior level, and DEP constraints, which prohibit the insertion of an element (e.g. a preposition) or the use of an element that is not present at the prior level (e.g. agreement). In phonology, such constraints can be restricted to hold in contexts such as the onset of a syllable or in nouns. For the three aspect splits we have examined here, the context is the perfective aspect, but we have also seen cross-cutting restrictions involving negatives and stage-level predicates.

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Say Hello to Markedness*

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In this paper, it will be shown that Bi-directional Optimality Theory (BOT) runs into problems of undergeneration when confronted with a certain class of partial-blocking phenomena.

The empirical problem used to illustrate this is the cross-linguistic variation of one-step past-referring tenses. It will be argued that the well-known ‘present perfect puzzle’ is a sub-problem of it. The solution to the cross-linguistic variation of these tenses involves blocking of the marked tense. The relevant notion of ‘markedness’, while underivable synchronically, is argued to be linked to diachronic learning processes similar to those investigated by Benz (2006).

1 Introduction

In recent years, the filtering of the generator’s output has become a topic of interest for students of the semantics-pragmatics interface. Aside from the general perspective of obtaining a simpler way of dealing with LF, one of the main areas of research in this direction have been phenomena where the compositional semantics is underspecified (cf. Reyle, 1993). With underspecification comes almost inevitably a combinatorial explosion of possible readings of a sentence, which has to be controlled somehow. As the semantics-module has already done its work at this time, the filtering device must be part of what is traditionally considered to be pragmatics.

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Some versions of Optimality Theory (OT) provide formalizations (or algorithms) which reproduce the effects of what has been captured by more traditional pragmatic principles, and seem therefore to be good choices for the implementation of such filtering devices. Bi-directional OT (BOT) has been recognized to be the variety of OT that deals most successfully with phenomena of total and partial blocking (cf. Beaver and Lee, 2004). As such, it will be the main topic of interest in this paper, which studies one particular type of blocking, and the challenges BOT faces when dealing with it.

This paper is structured as follows: First, I will present the present perfect puzzle, as stated in Portner (2003). I sketch briefly the standard accounts of it, and the points these standard accounts take for granted.

Then, I will argue that a solution to this problem involves partial blocking, because the present perfect puzzle should be seen as a sub-problem of the cross-linguistic variation of tenses locating an event (or an interval) one step before the moment of utterance, without any intervening moment of reference (I call these tenses ‘one-step past-referring tenses’).

Finally, I will examine the problems arising when standard BOT is applied as a filter for this purpose, and discuss how to overcome these problems.

2 The Present Perfect Puzzle

It is a well known (and well investigated) fact that present perfect tenses across Romance and Germanic languages vary, and recent years have seen a renewed interest in the investigation of the cause of this cross-linguistic variation.

2.1 The Problem

In English or Spanish, present perfects may not be combined with past-denoting localizing temporal adverbials. In other languages, like French or German, such combinations are perfectly acceptable.

- (1)
- a. *Mary has arrived {yesterday / at five o'clock}.
 - b. *María ha llegado {ayer / a las cinco}. (Spanish)
M. has arrived yesterday / at the five.
 - c. Marie est arrivée {hier / à cinq heures}. (French)
M. is arrived yesterday / at five o'clock.
 - d. Maria ist {gestern / um fünf} angekommen. (German)
M. is yesterday / at five arrived.

Similarly, dead people (or no longer existing objects) are not felicitous subjects of present perfect sentences in English or Spanish, whereas in French or German, such constructions are perfectly acceptable.

- (2)
- a. #Einstein has visited Princeton.
 - b. #Einstein ha visitado Princeton.
E. has visited Princeton.
 - c. Einstein a visité Princeton.
E. has visited Princeton.
 - d. Einstein hat Princeton besucht.
E. has Princeton visited.

Thus, present perfects vary considerably cross-linguistically. Intriguingly, this kind of variation seems to be restricted to *present* perfects alone. All other perfects (e.g., past perfects, perfects under modals, etc.) do not seem to vary according to the parameters we identified for the present perfect, and behave rather similarly throughout languages.

First, they do not show any incompatibility with temporal adverbials. This is illustrated in (3) only for English, but it holds as well for Spanish.¹

- (3)
- a. Mary had arrived {yesterday / the day before / at five o'clock}.
 - b. Mary will have arrived {the day before / at five o'clock}.
 - c. Mary might have arrived {yesterday / at five o'clock}.
 - d. Having arrived {yesterday / at five o'clock}, Mary will surely be able to help you.

¹ As is to be expected, French or German non-present perfects do not acquire any restrictions the present perfect did not already have.

Second, they do not show life-time effects, as the examples in (4) demonstrate:

- (4) a. Einstein might have visited Princeton.
 b. In 1941, Hitler invaded Russia. Napoleon had tried before him, but without success.

(4-a) can be uttered in 2008, even though Einstein has been dead for several decades. For a past perfect, like in (4-b), one would expect a life-time effect to arise with respect to a contextually fixed moment of reference *R* situated somewhere in the past (here: *in 1941*). However, the fact that Napoleon had long been dead in 1941 does not cause the sentence to become unacceptable.

The data in (1)–(4) shows that, if we want to maintain a strictly compositional semantics for perfect tenses (where the present perfect is a combination of a PRESENT and a PERFECT-feature, and a past perfect a combination of a PAST and a PERFECT-feature), the cause for the cross-linguistic variation of the present perfects cannot be directly attributed to a parametric variation of the semantics of the PERFECT-features involved (contra Klein, 1992, 2000).

2.2 Proposed Solutions

Having eliminated the PERFECT as a cause, there is one obvious candidate left as root of the present perfect puzzle: the PRESENT feature. And indeed, all current solutions to the present perfect puzzle hold it responsible in some way. There are two different versions of this general idea: a first school of thought (cf., e.g. Pancheva and von Stechow, 2004) attributes the variation directly to a difference in the PRESENT-features in the languages involved. A second tendency (cf., e.g. Portner, 2003; Rothstein, 2006a) blames the PRESENT more indirectly, via its interaction with some other element in the sentence.

We will now have a look at these accounts of the present perfect puzzle, and the reasons that lead ultimately to their rejection.²

² For want of space, this overview has to be very brief, and cannot do justice to any of the presented solutions. For a more complete presentation, see Schaden (2007, 2008).

2.2.1 *Different PRESENT-Features*

Pancheva and von Stechow (2004) assume that English and German have different values for the PRESENT-feature, and that this fact is the crucial ingredient in deriving the present perfect puzzle. The core idea is that the German present is a non-past tense, whereas the English present would be a ‘real’ present tense (cf. also Giorgi and Pianesi, 1997).

However, as Rothstein (2006b) points out, if the semantics of the PRESENT is the source of the variation of the present perfects, two languages having similar present tenses should also have similar present perfect tenses, whatever the exact theoretical motivation of the differences may be. But the Swedish present tense patterns systematically with the German present against the English present, whereas the Swedish present perfect patterns with the English present perfect against the German present perfect.

Based on these facts, Rothstein concludes that the semantics of the PRESENT is not systematically correlated with the behavior of the present perfect, and therefore cannot be the cause of the cross-linguistic variation of the present perfect tenses.

2.2.2 *Feature-Clash Accounts of the Present Perfect Puzzle*

The second line of thought derives the infelicity of sentences like (1) in English more indirectly as the result of a feature-clash between the PRESENT-feature and a PAST-feature instantiated on the adverbial.

For Portner (2003), the clashes involved are between presuppositions. However, as shown by Nishiyama and Koenig (2004), the alleged presuppositions aren’t amendable by standard metalinguistic negation.

Rothstein’s own proposal, based on Musan (2002), puts the blame on the syntax, and more precisely, on the way in which syntax allows or puts constraints on the interaction of the PRESENT-feature with the inherent features of past-denoting localizing temporal adverbials like *yesterday*. The basic idea is

the following: in a language like English, the auxiliary c-commands the temporal adverbials and can restrict their distribution (by incompatibility of the present tense of the auxiliary with the ‘past-ness’ of the adverbial). But in a language like German, the auxiliary does not c-command the temporal adverbials, and is not able to restrict their distribution: the ‘pastness’ of the adverbial will not cause any conflict with the ‘present’-component of the tense-feature.

According to Rothstein (2006b: 4), this difference boils down to the fact that in German, the auxiliary and the participle form a constituent, but not in languages like Swedish or English. However, this claim makes wrong predictions for Romance languages (cf. Schaden, 2008).

2.2.3 *Elements Common to All Current Analyses of the Present Perfect Puzzle*

Instead of going into the details of the previously presented accounts, I will rather comment upon three elements all current analyses have in common, and discuss what is at stake in maintaining or dismissing them.

First of all, they all assume that the semantics of the PERFECT-feature is *not* involved in the cross-linguistic variation. This may seem counter-intuitive, but such a position has important advantages, and constitutes in my mind important progress. While maintaining a strictly compositional theory of the tense-aspect system, this move allows us to assign one single value for the PERFECT-feature in languages like English or Spanish. And not only this: one may assume one single value for the PERFECT-feature cross-linguistically. The specific constraints of the present perfect can be assumed to arise from elsewhere.

Second, all these theories assume that the present perfect puzzle is rooted somewhere in the semantics or syntax of the languages involved. This means that the puzzle is located in the core-grammar. Such a position comes with a very strong commitment: sentences violating the constraints of the present perfect in English or Spanish must be assumed to be *ungrammatical*. However, as we will see in section 3.1, this is at least questionable.

Last, these theories treat the present perfect puzzle as an isolated phenomenon. I think that this misses an empirical generalization that should be made: there is no way of tying the cross-linguistic variation of the present perfect tenses to the cross-linguistic variation of the simple past tenses (a phenomenon that has not been investigated, as far as I am aware, with respect to its eventual connection to the present perfects).

3 Towards the Bigger Picture

In previous work (Schaden, 2007, 2008), I have argued that the present perfect puzzle should be seen in connection with what one may call the ‘simple past puzzle’, and forms a sub-problem of what I call the ‘cross-linguistic variation of one-step past-referring tenses’.

I will review the reasons for this change of perspectives in what follows.

3.1 The Grammaticality Issue

As we have seen in the preceding section, current theories on the present perfect puzzle are committed to the view that sentences like ‘*I have arrived yesterday*’ are ungrammatical. However, while these constraints observed with present perfects in English are indeed very strong tendencies, they do not seem to be inviolable. In some of the (not so recent) literature on present perfects, as well as in corpora, one finds examples of combinations of present perfects with past-denoting temporal adverbials in English:

- (1) a. We *have received* information on F.S. from you *on the 22nd of September last*.³
- b. Thank you, the point which Mr *has made yesterday*, I think will continue to make.⁴

³ Example taken from Maurice (1935), cited from McCoard (1978: 129).

⁴ Examples (1-b-c) found in the *British National Corpus*. Query: “has _ yesterday”.

- c. In the event my Lord, erm, that er your Lordship felt that further guidance was required, there are the two routes that I've *indicated* to your Lordship briefly *yesterday*, [...]

It might be argued that those examples come from (substandard) dialects, involving informal speech, and which have developed a diverging grammar from standard (British) English. However, as far as I could check in the BNC, the examples in (1) come from rather formal speech situations.

Moreover, we find the same type of exceptions to the general pattern also in Spanish corpora:

- (2) a. Don Fulano de Tal y Tal *ha muerto ayer*, a las seis de la tarde.⁵
D. F. d. T. y T. has died yesterday, at the six of the afternoon.
- b. [...] estaba previsto en primer término rendir un muy merecido homenaje a [...] was planned in first place give a very deserved homage to una figura de las letras argentinas que *ha fallecido ayer*, Adolfo one figure of the literature Argentinean that has deceased yesterday, A. Bioy Casares.⁶
B. C.

I do not think that the examples in (1)–(2) provide us with any proof for an on-going ‘grammaticalization’ of present perfects of English or Spanish. They are too rare for that. However, the mere existence of such examples shows that in some contexts, speakers may find such constructions acceptable. Furthermore, the type of verbs we find in these examples is quite revealing: in all these contexts, the utterances are not only about a past event localized in time by the adverbial. They also carry a strong meaning component of a state resulting from that action and holding at the moment of utterance (to have received ⇒ to be in possession of; to have died ⇒ to be dead). This can be tied to a

⁵ L. Rosales, *Cervantes y la libertad*. REAL ACADEMIA ESPAÑOLA: Banco de datos (CORDE) [online]. Corpus diacrónico del español. <http://www.rae.es> [11-09-2007].

⁶ Recorded in a meeting of the Argentinean Senate, 1999, REAL ACADEMIA ESPAÑOLA: Banco de datos (CREA) [online]. Corpus de referencia del español actual. <http://www.rae.es> [11-09-2007].

standard descriptive notion commonly associated with perfect tenses, namely *current relevance*.⁷

But before discussing this further, let us focus on another question: is the present perfect puzzle really an isolated problem, or is it part of a bigger puzzle?

3.2 What about Competition?

Present perfects ‘live’ in a highly competitive environment: they compete against a simple past tense in all the languages discussed here. Compare (3) to (1) (on p. 74) and (4) to (2) (on p. 75):

- (3)
- a. Mary arrived {yesterday / at five o’clock}.
 - b. María llegó {ayer / a las cinco}. (Spanish)
M. arrived yesterday / at the five.
 - c. Marie arriva {*hier / à cinq heures}. (French)⁸
M. arrived yesterday / at five o’clock.
 - d. Maria kam {gestern / um fünf an}. (German)
M. arrived yesterday / at five on.
- (4)
- a. Einstein visited Princeton.
 - b. Einstein visitó Princeton. (Spanish)
E. visited P.
 - c. Einstein visita Princeton. (French)
E. visited P.
 - d. Einstein besuchte Princeton. (German)
E. visited P.

Given that there is some room for choice in these contexts, a question emerges:

⁷ This notion has been heavily criticized for not being precise enough (cf. Klein, 1992), and I agree with that criticism. I do think however, that *current relevance* still is a valuable notion, in that it allows us to abstract away from some technical issues of perfect semantics (Extended-Now theories vs. Anteriority theories with resulting/perfect state). As such, I will use it extensively in this paper, because my proposal is in principle independent of such technical issues.

⁸ In French, the *passé simple* is incompatible with expressions which have a — even weak — link with the deixis (like *yesterday*).

could it be that the determining influence in the variation of present perfect tenses is not the present tense, but rather the simple past tense? Couldn't some uses of the present perfect be simply *blocked* in languages like English and Spanish?

Such a hypothesis comes with a prediction: if competition were a determining factor in the present perfect puzzle — which would turn out then to be an instance of partial blocking —, one would expect there to be restrictions against the use of the simple pasts as well, because under the assumptions presented above, the distributions of the present perfect and the simple past tenses should be interdependent.

So, is there anything like a cross-linguistic variation of simple past tenses mirroring the variation of the present perfects?

3.2.1 *Restrictions Against the Use the Simple Past Tense*

Some authors, like Kratzer (1998), have noticed that there are contexts in which a simple past tense could be used in English, but where it would be infelicitous in German. She points out that in a context where speaker and hearer stand in front of the church under discussion, (5-a) is infelicitous, whereas (5-b) is fine:⁹

- (5) a. #Wer baute diese Kirche? Borromini baute diese Kirche.
 who built this church? B. built this church.
 b. Who built this church? Borromini built this church.

Exactly the same opposition can be observed between French and Spanish:

- (6) a. #Qui construisit cette église? Borromini construisit cette église.
 How built this church? B. built this church.
 b. ¿Quién construyó esta iglesia? Borromini construyó esta iglesia.
 Who built this church? B. built this church.

As far as I am aware, these observations have had few, if any repercussions so

⁹ Examples in (5) from Kratzer (1998).

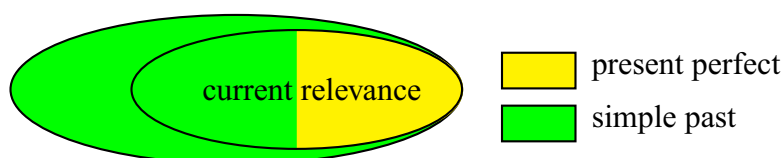
far on the discussion of perfects. Yet, note that it is generally the case that, in French and German, in some situations one cannot use the simple past tense:

- | | | | |
|-----|-------------------------------|-----|------------------------------|
| (7) | [Archimedes in his bath ...] | (8) | [Kasparov to Deep Blue ...] |
| a. | I found it! | a. | I won! |
| b. | ¡Lo encontré!
it found | b. | ¡Gané!
won |
| c. | #Ich fand es!
I found it | c. | #Ich gewann!
I won |
| d. | #Je le trouvai!
I it found | d. | #Je gagnai!
I won |

In all of these examples, we are not talking simply about a past event of *finding* or *winning*. (8) are just as much about a current state of *possessing* or *being a winner*. From a purely descriptive point of view, one may state the following generalization: when there are some immediate repercussions of the action with the moment of utterance, or if there is some link between the event and the moment of utterance, the simple past is inadequate in German and French. And of course, this idea of ‘immediate repercussions’ can be captured also with a notion we have already come across: *current relevance*.

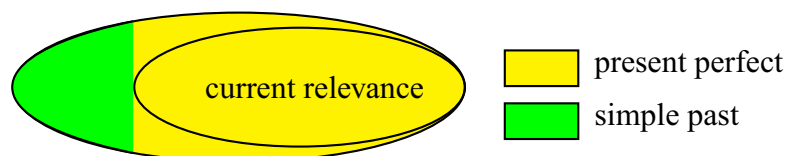
Indeed, the respective distributions of the simple past tenses and the present perfect tenses can be nicely illustrated based on this key notion of the literature on perfects:

- (9) a. English, Spanish:



The simple past is not incompatible with a current relevance reading. The present perfect is restricted to current relevance readings.

- b. French, German:



The simple past is incompatible with current relevance readings. The present perfect doesn't guarantee a current relevance reading.

We can put this in a way that makes the connection with partial blocking clearer: in English and Spanish, you *can* (almost) always use the simple past tense, and sometimes, you *have to* use the simple past tense. In these latter contexts, the present perfect is blocked. In German and French, you *can* (almost) always use the present perfect, and sometimes, you *have to* use the present perfect. In these latter contexts, the simple past is blocked.

3.2.2 Filtering with Bi-Directional OT (BOT)?

Blocking is one of the key selling points of BOT (cf. Beaver and Lee, 2004; Benz, 2006). 'Classical' BOT (cf. Blutner, 1999) tries to establish the optimal coupling of form-meaning pairs (i.e., the *grammatical perspective*, as van Deemter (2004) calls it). As I have argued above, however, there are reasons to shy away from hard-wiring the constraints into the core-grammar of the languages involved. However, there are extensions of BOT supposing that a grammar already pre-establishes possible form-meaning pairs, but that there is subsequent optimization to find the *best* pair among the *possible* pairs in a given context (cf. van Deemter, 2004: the *selectional perspective*). This second perspective seems to be a good candidate to deal successfully with our problem: the competition at hand can be analyzed as involving the optimal choice of a tense-form (that is: a form-meaning couple) with respect to some context of use. Alternatively, one might see it in terms of DRT as optimal embedding with respect to a model. This places the application of BOT outside the core-grammar (that is, the relation of the linguistic form with meaning), and at the

interface of grammar with the non-linguistic world (or a model of a world).

As the basic problem can be stated as one of optimal coupling, a priori, BOT in its selectional perspective should have something to say about it. However, as we will see, as it stands, BOT cannot deal with our problem at hand in a satisfying manner, and some additions need to be made.

Before turning to this matter, let me state first what underlying semantics for the simple past and the present perfect tenses I assume.

4 Spelling Out the Analysis

In order to be as explicit as possible concerning the forms and meanings the BOT-filter will work on, it is important to make clear my assumptions with respect to the compositional semantics of the tense-aspect system, before detailing the problems (namely an undergeneration-issue) with a standard BOT account.

4.1 The Compositional Semantics

I take both the present perfect and the simple past to locate an interval (the interval of assertion, according to Klein (1994)) in the past with respect to the moment of utterance. Thus, in principle, both should be available when it comes to situate an event in the past. However, I assume the present perfect to introduce a *perfect state* at the moment of utterance (cf. Portner, 2003; Nishiyama and Koenig, 2004). The listener must infer the predicate Q of the perfect state by pragmatic reasoning. This perfect state can be seen as the formal device responsible for the current relevance effect. The relevant semantics can be thus be represented as follows:

- (1) a. $\llbracket \text{past} \rrbracket = \lambda p \exists i [i \prec n \wedge p(i)]$
 where n is the moment of utterance, i an interval, and p a variable over propositions. ‘ \prec ’ denotes a relation of strict precedence.

- b. $\llbracket \text{present} \circ \text{perfect} \rrbracket^{10} = \lambda p \exists i, i', s [n \subseteq i \wedge i' \prec i \wedge Q(s) \wedge i \subseteq \tau(s) \wedge p(i')]$
 where n is the moment of utterance, Q a free variable, and s is the perfect state

More generally, almost all theories of the perfect I know assume that the perfect contains some relation of anteriority, and some kind of ‘link’ between the event and the contextually fixed moment of reference. I assume that the restrictions of use of the present perfect and simple past tenses are (basically pragmatic) consequences of the presence or absence of the perfect state — and thus, of current relevance —, in a way that will be made clearer below.

4.2 Problems with a (naive) application of BOT

I have assumed the same compositional semantics for the present, past and perfect features in all languages under discussion. The cross-linguistic differences pointed out above should therefore come out as a result of different configurations of the filtering device. As I have argued that we face a case of partial blocking, and because BOT has been applied successfully to many cases of partial blocking, tentatively, we will try to establish a BOT filter.

Notice that, under the formulations in (1), the meaning of the PAST is less complex than the meaning of the PRESENT \circ PERFECT (i.e., PAST \prec PRESENT \circ PERFECT). While it is not always entirely clear how to deal with issues of complexity in the area of meaning,¹¹ in our case, the problem boils down to entailment (at least under standard assumptions about the way we conceive time), and can be considered to be unproblematic: the more complex a meaning is, the more possible states of the world it excludes.

¹⁰ The form-sense mapping of the perfect, and thus, the question of which morphemes carry the present and perfect meanings is tricky, and has not yet been answered in a satisfactory way. However, recent analyses of the German “Zustandspassiv” (stative passive) by Maienborn (2008), and its resemblance with the analysis of the perfect by Nishiyama and Koenig (2004) suggest that the present component comes from the auxiliary, and that the perfect component is encoded on the participle.

¹¹ But see Merin (2003) for a discussion, and a proposition to resolve this issue.

When it comes to the complexity of the forms involved, one observes that those forms are nearly identical in all languages at hand: the simple past tense is synthetic, and shorter (in number of words, or syllables) than the analytic present perfect form (i.e., past \prec present perfect).

The great appeal of BOT comes from the fact that it is able to derive phenomena of partial blocking from these item-internal parameters of complexity. However, in the particular case we are dealing with, taking into account only these token-internal parameters will not allow us to derive the facts. The problem is the following: as BOT is a model of speaker-hearer trade-offs in order to find the optimal form-meaning coupling with respect to a context — and because these trade-offs should arguably be independent of the grammars of particular languages — BOT will only derive one pattern, and not the two patterns we are facing. Thus, BOT faces an undergeneration-issue when dealing with such a kind of partial blocking.

More specifically, under all formulations of BOT I know, one would expect the English pattern to prevail everywhere, as it maximizes the use of the ‘lighter’ simple past, and restricts the more complex present perfect. This tendency to use a marked (i.e., heavier) form to describe a marked situation, and to use an unmarked (i.e., light) form to describe an unmarked situation is reminiscent of Horn’s ‘division of pragmatic labour’ (cf. Horn, 1984: 22).

However, the German and French pattern instantiates exactly the opposite strategy: we obtain a situation where the speaker-hearer strategies associate the marked (i.e., heavier) form with an unmarked situation, and the unmarked form with the marked situation.¹²

¹² Notice that this fact raises a puzzle for game-theoretical approaches to pragmatics — and as these approaches have been shown to be identical to BOT (cf. Dekker and van Rooy, 2000), also to BOT: A so-called ‘anti-Horn strategy’ (the German pattern) should not be able to invade a population using a ‘Horn-strategy’ (the English pattern). However, diachronically, this is exactly what we observe: the German and French patterns evolve from stages that closely correspond to the current English pattern. According to the literature on grammaticalization (cf. Bybee et al., 1994), this is even a regular and recurring change. The diachronic way of change predicted by a straightforward application of game-theory, that is, from the German

But let us now consider how and whether it is possible to amend BOT to get a grip on this particular case of partial blocking. The issue is the following: we need a means of making the present perfect ‘win’ in German-type languages. The obvious solution in OT would be to rank the constraints. However, this is not a habitual procedure in BOT. Why should the speaker-based constraints outweigh the hearer-based constraints in one language, and why should it be the other way round in another language?

Furthermore, we don’t simply want to promote one form from the position of a ‘loser’ to a ‘winner’. We need partial, not total, blocking, and we want to exploit the competition situation in order to get different interpretations for the two forms. BOT allows for this, but not unidirectional OT (cf. Beaver and Lee, 2004).

The ability to declare (arbitrarily?, but certainly extrinsically) one of the tenses ‘default’ and the other ‘marked’ would resolve all our problems (as we will see in section 4.3), but it comes at a cost: we are stuck with a non-derived notion of markedness, which does not seem to be reducible to any of the uses inventoried by Haspelmath (2006). This is certainly an undesirable situation — which should be eliminated in the end —, but let us first check how the blocking device (BOT + a markedness parameter) could work.

4.3 Implementing the Blocking Device

The basic assumption for the implementation of the blocking device is the following: a speaker has to choose from two alternative ways of expressing that the interval of assertion is situated before the moment of utterance. One is marked, the other is the default form. The use of the marked form triggers pragmatic effects, and depending on which form is marked, the pragmatic effects will be different. There are two configurations:

to the English pattern, however, seems to be extremely rare, or maybe even nonexistent.

(2) a. English, Spanish:

Default form:	Marked form:
Simple past tense	Present perfect
↓	↓
no pragmatic effect	triggers pragmatic reasoning

b. French, German:

Default form:	Marked form:
Present perfect	Simple past tense
↓	↓
no pragmatic effect	triggers pragmatic reasoning

We need to keep in mind that the main difference between a simple past and the present perfect tense is the presence of a perfect state in the latter.

If the simple past is the default form, we have two cases to consider: if a speaker uses a simple past, the event may or may not have any particular consequence at the moment of utterance. No inference can be derived from the use of the default. However, if a speaker uses the marked present perfect, the following questions and inferences will arise: in using a tense containing a perfect state when he didn't have to, the speaker invites the listener to infer that he commits to the existence of some special consequence of the event at the moment of utterance.

Let us check how we can derive the infelicity of sentences like '*John has died yesterday*' in English. Assuming that the speaker always goes for the default form, unless there is a good reason to avoid it, the preference for the simple past in such sentences is an instance of the second maxim of quantity (*Do not say more than you need*). However, a speaker might choose the present perfect if he considers the localisation of the event, as well as the resulting perfect state, to be necessary to be communicated.

If the present perfect is the unmarked form, there are also two cases to consider. If the speaker uses the default present perfect, the event may or may not have any particular consequence at the moment of utterance; the default is not informative. However, if the speaker uses a simple past tense, the listener will

ask himself why the speaker unnecessarily used a tense containing no perfect state, and infer then that it is because the speaker commits to the non-existence of special consequences of the event at the moment of utterance.

Let us consider why a sentence like ‘*I found it!*’ is infelicitous in German. Assuming again that the speaker chooses the default unless he has reasons to avoid it, the use of a perfect-state-less simple past will indicate to the hearer that the speaker does not believe that there is a consequence of the event for the moment of utterance. But if there is nothing in the context to attach the finding-event to, the use of a simple past will be a violation of the first maxim of quantity (*Say as much as you can*).

Under the assumptions presented above, it follows straightforwardly why the variation is restricted to present perfects and simple pasts. Other perfect forms (finite or non-finite) do not compete in the same way with a “simple” tense, that is, a tense without a perfect state. For instance, there is no alternative to a past perfect without a perfect state (i.e., anteriority of the interval of assertion (or the eventuality) with respect to a point of reference situated before the moment of utterance), which would have the semantics outlined in (3-b), and therefore, no blocking can arise:

- (3) a. $\llbracket \text{past} \circ \text{perfect} \rrbracket = \lambda p \exists i, i', s [i \prec n \wedge i' \prec i \wedge Q(s) \wedge i \subseteq \tau(s) \wedge p(i')]$
 b. $\llbracket \text{past} \circ ? \rrbracket = \lambda p \exists i, i' [i \prec n \wedge i' \prec i \wedge p(i')]$

This assumption also allows for a verifiable, cross-linguistic prediction: according to a pragmatic, competition-based account, no language having only one one-step past-referring tense should display any restriction reminiscent of the present perfect or simple past puzzles. However, if a semantics- or syntax-based account is correct, such a language might exist.

Summing up, the filtering device based on basically Gricean pragmatics seems to work, and to give us a good description of the data. Still, the present account suffers from a lack of explicative power, as the stipulated markedness parameter seems to be completely *ad hoc*, and in a way that appears to be diffi-

cult to amend — at least when it is considered on a purely synchronic level of analysis.

5 Synchronic Markedness as a Consequence of Diachronic Processes

The undergeneration-problem of standard BOT when applied strictly synchronically to the distribution of the present perfect and simple past tenses is not the only issue with BOT as a general theory of partial blocking. As noted by Benz (2006), BOT faces important problems of overgeneration as well, predicting cases of partial blocking in contexts where they aren't attested.

The main insight in Benz (2006) is that at least certain kinds of partial blocking phenomena cannot be explained solely in the light of a synchronic snapshot, by resorting to an algorithm like the one provided by BOT, or by more traditional-looking formalisms like the one proposed by Horn (1984). Benz insists on the necessity of a learning mechanism (which he calls *associative learning*), and the diachronic process necessary for the partial blocking to evolve. It is on top of these diachronic learning processes that BOT (or game theory) comes into play.

It is well-known that the distributions of the one-step past-referring tenses in contemporary German or French are the result of a long diachronic process. It is also well known that present perfects — deriving often from resultative forms — frequently become past tenses in the course of history (cf. Meillet, 1909/1982, 1912/1982). In the process, they displace the ancient simple past form — which may eventually die out.¹³ Languages like English and German can be seen to exemplify different stages in this development.

In a first stage, exemplified by classical Latin, there is only one one-step past-referring tense, which necessarily is the default. In a second stage,¹⁴ the

¹³ Nothing requires the present perfect to be the winner in the diachronic change: in at least some dialects of Brazilian Portuguese, the present perfect is extremely restricted, and the simple past prevails in almost all contexts (cf. Laca et al., to appear).

¹⁴ This could be a situation such as we observe in most varieties of contemporary English. Note

past tense is still dominating (and thus default). However, a present perfect form has become available.

Then, in a third stage, the present perfect is used more and more, and eventually becomes the default for some areas.¹⁵ Finally, the present perfect becomes default everywhere, and the simple past tense is restricted to non-current relevance contexts (e.g., contemporary standard German). If the old simple past tense disappears completely, we are back at the beginning of the circle.

How is it possible to understand this shift of the present perfect to a more and more past-tense like meaning? An analogy sometimes advanced is *inflation* (cf. Dahl, 2001). The basic idea is the following: by resorting to a marked, unusual form, the speaker invites the hearer to induce a certain type of meaning effect. However, the more a speaker exploits such an effect, the smaller that effect will become, because the hearer gets used to it, or even anticipates it. Therefore, the frequency of a form is not only an indicator for a grammaticalization-process, but also a factor in this process (cf. Bybee, 2003).

In our case, the effect produced initially (thus in languages like English) is one of current relevance, induced by the presence of a marked perfect state where the default would have been not to use one. However, in most contexts the current relevance effect should be deducible by general pragmatic principles, without any additional formal marking. Why indeed should somebody mention an event that wouldn't be relevant in the utterance context? If the frequency of present perfects remains low, the hearer could deduce that the events appearing in present perfect have some particular importance, but the higher the frequency of this tense becomes, the less informative its use will be for the hearer. At some point, there may occur a swap in 'polarity': if the use of the marked form becomes that frequent that it is expected everywhere, it is not its appearance, but

that it is in the period between the first and the second stage that the essential part of what is strictly speaking the *grammatical* change of the perfect takes place.

¹⁵ Cf. the "rule of the 24 hours": an event that occurred during the current day takes the present perfect; if it happened before, the simple past must be used. This is exemplified in contemporary Iberian Spanish, or in 17th century French.

its absence that will become informative for the hearer. Thus, we get a situation resembling the German distribution.

In this way, we can tie the markedness-effect (and swap) indirectly to a parameter of frequency in synchrony,¹⁶ although considering the synchronic side of things isn't enough. Learning processes, as Benz (2006) has clearly shown, are crucial for the derivation of partial blocking phenomena, and form a necessary complement to BOT in a general theory of partial blocking.

6 Conclusion

In this paper, I have shown that the present perfect puzzle should be seen as a part of a bigger whole, namely the cross-linguistic variation of one-step past-referring tenses. I have argued that its analysis must involve partial blocking, and I have shown its implications for BOT — namely an undergeneration-issue. This problem can be resolved by adding a markedness-parameter to the theory.

Finally, I have tried to reconsider the synchronic algorithm of BOT in a diachronic perspective, following the lead of Benz (2006), in order to motivate the markedness parameter.

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¹⁶ I would like to thank Hedde Zeijlstra for insisting on this synchronic vision of the data, and for suggesting that frequency might play a role after all.

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Variation in resumption requires violable constraints – a case study in Alemannic relativization*

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Variation in dative resumption among and within Alemannic varieties of German strongly favors an Evaluator component that makes use of optimality-theoretic evaluation rather than filters as in the Minimalist Program (MP). At the same time, the variation is restricted to realizational requirements. This supports a model of syntax like the Derivations and Evaluations framework (Broekhuis 2008) that combines a restrictive MP-style Generator with an Evaluator that includes ranked violable (interface) constraints.

Keywords: resumption, Swiss German, variation, evaluator, Reference Set, Candidate Set, dative, constraints, oblique case, relative clauses

1 Introduction

Optimality Theory (OT) and the Minimalist Program (MP) are usually seen as two mutually exclusive models of grammar that differ fundamentally in their architecture. Broekhuis (2008), however, shows convincingly that the similarities are in fact much larger than is normally assumed: Both models contain a Generator which is responsible for the universal properties of language, and both make use of an Evaluator which is responsible for (certain

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types of) cross-linguistic variation. While in early MP, variation between languages was solely attributed to the lexicon (differences in feature strength), more recent versions of MP (since Chomsky 2001) also make use of output filters/interface constraints. The difference in the treatment of language variation between OT and MP is thus narrowed down; in many cases it boils down to the question whether the Evaluator takes recourse to output filters or to ranked constraints. Language variation is thus a very important domain to test the validity of a given framework.

In this article I will investigate variation in dative resumption in a number of Alemannic dialects. I will first introduce the basic facts about Swiss German relativization. In section 3 I will explain the distribution of resumptive pronouns as a last resort. Thereafter, I show that resumptive relatives are best analyzed as involving base-generation. Section 5 compares MP and OT-analyses of the basic facts. Section 6 introduces various types of variation which show that an Evaluator with ranked constraints is descriptively as well as explanatorily more adequate than one based on filters. Section 7 concludes the paper.

2 Resumption in Swiss German relative clauses

Swiss German relative clauses are introduced by an invariant complementizer *wo* (*won* before unstressed vowels). There are no relative pronouns as in Standard German (except in certain adverbial relations).¹ In certain grammatical relations, a resumptive pronoun appears instead of a gap. In the default case those resumptives behave like weak personal pronouns and are fronted to the Wackernagel position or are cliticized onto C (or, in case of oblique objects, onto the governing preposition). According to earlier descriptions, the distribution of resumptive pronouns in restrictive local relativization follows the

¹ See Salzmann (to appear a, fn. 2) for qualifications.

Accessibility Hierarchy by Keenan & Comrie (1977): Resumptive pronouns are found from the dative object on downwards, but crucially not for subjects and direct objects. This is illustrated by the following examples from the High Alemannic dialect spoken in the canton of Zurich (cf. Weber 1964, Van Riemsdijk 1989):²

- (1) a) d Frau, wo **(*si)** immer z spaat chunt
 the woman C (she) always too late comes
 ‘the woman who is always late’ (SU: gap)
- b) es Bild, wo niemert **(*s)** cha zale
 a picture C nobody (it) can pay
 ‘a picture that nobody can afford’ (DO: gap)
- c) de Bueb, wo mer ***(em)** es Velo versproche händ
 the boy C we (he.DAT) a bike promised have.1PL
 ‘the boy we promised a bike’ (IO: res.)
- d) d Frau, won i von ***(ere)** es Buech überchoo han
 the woman C I from (she) a book got have.1SG
 ‘the woman from whom I got a book’ (P-object: res.)

Additionally, resumptive pronouns also occur inside islands, cf. 3.1 below.

3 Resumption as a last resort

Languages that employ resumptive pronouns come in at least two types: In some, e.g. Irish, certain Italian dialects, Hebrew etc. (e.g. McCloskey 1990, Bianchi 2004), resumptive and gap relatives exist side by side, at least in certain

² For the transcription see Salzmann (2006: 320, fn. 259). Long-distance relativization, where resumptive pronouns appear across the board, can be argued to instantiate a different construction, cf. Salzmann (2006, chapter 4.9), van Riemsdijk (2008). For possessor relativization, cf. Salzmann (to appear b). Free relatives require *wh*-relative pronouns that leave gaps, cf. van Riemsdijk (1989). Appositive relatives behave like restrictive relatives with respect to resumption, except for the indirect object. Resumptive pronouns also occur in comparatives, cf. Salzmann (2006), but not, or at least not systematically, in topicalization and *wh*-movement, cf. Salzmann (2006: 376: fn. 297) and Salzmann (to appear b, section 4) for details.

positions. In other words, resumptive pronouns represent a strategy that is in principle freely available. In others, resumptive pronouns only come into play when gap derivations fail (e.g. Shlonsky 1992, Pesetsky 1998, Rouveret 2008). I would like to argue that Swiss German belongs to the second group. Strong evidence for this position comes from the complementary distribution between gaps and resumptive pronouns. Whenever a gap is possible, a resumptive pronoun is not, and vice versa (as we will see in section 6 below, things are more complex with datives). The occurrence of resumptive pronouns can be related to two different grammatical constraints: locality and the realization of oblique case.

3.1 Resumptive pronouns amnesty locality violations

Resumptive pronouns also occur in positions from where extraction is impossible. This is illustrated by the following pair contrasting *wh*-extraction with relativization of a DO from a temporal adjunct clause (Salzmann 2006: 331, Salzmann to appear b; islands are henceforth enclosed in angled brackets):³

(2) a) de Sanger, won i mi froi, <wann i *(en) gsee>
 the singer C I me be.happy.1SG when I him see.1SG
 ‘the singer such that I am happy when I see him’

b) * [Wele Sanger]₁ froisch di, < wann t ___₁/en gseesch >?
 which singer be.happy.2SG you when you him see.2SG
 lit.: ‘Which singer are you happy when you see?’

Resumptive pronouns thus occur to prevent a locality violation. This immediately accounts for resumptive pronouns after prepositions as in (1d) since

³ The *wh*-extraction does not improve with resumption. In Salzmann (to appear b, section 4), I have linked this to the fact that *wh*-operators (as apposed to silent relative operators, cf. section 4.2) are case-marked and therefore cannot be base-generated in the operator position. If they were, their case-feature could not be checked, and the derivation would crash. Since resumption is analyzed as base-generation here (cf. section 4), there is no possibility for resumption under (regular) *wh*-movement.

complement PPs form strong islands in German and its varieties, as shown by example (3): The PP *vo wem* cannot be extracted from the PP introduced by *a* ‘at’.

- (3) * [Vo wem]₁ häsch < a d Schwöschter ___₁ > tänkt?
 of who.DAT have.2SG at the sister thought
 lit.: ‘Who did think of the sister of?’

This interpretation of the facts is strengthened by the observation that the same obtains when non-individual denoting types are relativized. In the following pair, a predicate is relativized on; in (4a) it originates in a transparent position, in (4b) it originates within a PP (i.e. within an island). While resumption is impossible in the first example, it is obligatory in the second (Salzmann 2006):

- (4) a) Er isch de **glic** **Idiot**, wo scho sin Vatter (***das**) gsii isch.
 he is the same idiot C already his father that been is
 ‘He is the same idiot his father already was.’
- b) Isch de Hans würc

Importantly, amnestying a locality violation is not to be understood in a processing sense: Relative clauses with resumptive pronouns inside islands are perfectly natural in Swiss German and do not have a repair flavor like intrusive pronouns in English, cf. Chao & Sells (1983).

3.2 Dative resumptive pronouns realize oblique case

Dative resumptive pronouns cannot be related to locality since they occur in positions from where extraction is readily possible:

⁴ In the b-example the resumptive pronoun is an R-pronoun, the pronominal part of a pronominal adverb. Pronominal adverbs occur when prepositions take an inanimate pronominal complement (cf. Salzmann 2006: 325f. for details). This extends to resumption. In the present case, the resuming element for a predicate would be *das*, which is turned into *de-*.

- (5) [Welem Maa]₁ häsch ___₁ es Buech ggëë?
 which.DAT man have.2s a book given?
 ‘To which man did you give a book?’

Instead, the occurrence of dative resumptive pronouns can be related to a language-internal constraint that requires the overt realization of oblique case: As in Standard German (cf. Bayer et al. 2001), dative, the only oblique case in the Swiss German case system (genitive has been lost), requires special morphological licensing. Bayer et al. (2001) discuss a number of contexts two of which I will repeat here: First, complement clauses cannot directly fill the slot of a dative argument (Bayer et al. 2001: 471):

- (6) a) Wir bestritten, (die Behauptung) [dass wir verreisen wollten].
 we denied the.ACC claim that we travel.away wanted
 ‘We denied that we wanted to go away.’
 b) Wir widersprachen * (**der Behauptung**), [dass wir ... wollten].
 we objected the.DAT claim that we ... wanted
 ‘We rejected the allegation that we wanted to go away.’

Since CPs cannot realize morphological case in German, a DP has to be inserted to rescue example (6b). The non-oblique (i.e. direct) cases nominative and accusative do not require this extra licensing, a DP realizing such a case is therefore optional (6a). Second, Topic Drop is possible with nominative (subjects) and accusative (direct objects), but not with datives, cf. Bayer et al. (2001: 489):

- (7) a) [_{acc}] Hab’ ich schon gesehen. b)* [_{dat}] Würde ich nicht vertrauen.
 have I already seen would I not trust
 ‘I have already seen (it).’ ‘I wouldn’t trust (him).’

The fact that the dative also stands out in Swiss German relativization is simply a consequence of the constraint that requires overt realization of oblique case. The fact that there are no resumptive pronouns for subjects and direct objects

follows automatically: They are realized by non-oblique cases which do not require any special morphological licensing.⁵

The direct/oblique-split in resumption is by no means exotic. It is found in a number of languages in the sample of Keenan & Comrie (1977: 93). Toman (1998: 305) reports the same pattern for colloquial Czech and Alexopoulou (2006: 63) for restrictive relatives in Greek.⁶

4 Resumption in Swiss German as Base-Generation

4.1 Movement or Base-generation?

While gap relatives can straightforwardly be analyzed as involving movement, the analysis of resumptive relatives is less straightforward. While the literature up to the 1990's took a base-generation analysis for granted, more recent contributions such as e.g. Pesetsky (1998), Aoun et al. (2001), Boeckx (2003), and Bianchi (2004) have argued in favor of a movement analysis of resumption.

⁵ Matching effects (Salzmann 2006: 348ff.; Salzmann to appear a: section 5.4; Salzmann & Seiler in prep.) provide additional evidence that resumption is related to the realization of oblique case. Problems with Bayer et al's generalization and other strategies to realize oblique case in German varieties are discussed in Salzmann (to appear a, fn. 8/9).

⁶ There have been alternative – syntactic – proposals to explain resumptive pronouns for oblique cases most of which attempt to unify them with resumptive pronouns after prepositions. Some (e.g. Boeckx 2003, Bianchi 2004) have linked them to inherent case. As discussed in Salzmann (2006: 373; Salzmann to appear a: section 4.1.3), this does not work for Swiss German because datives require resumptive pronouns irrespective of whether they are structural or inherent. Furthermore, inherent accusatives do not require resumptive pronouns. What is important in Swiss German is thus the morphological notion „oblique case“. Van Riemsdijk (1989) argues that datives are in fact PPs so that dropping the resumptive pronoun would violate recoverability. See Salzmann (2006: 369ff.) and Salzmann (to appear a: section 4.1.3) for evidence that dative resumptive pronouns cannot be reanalyzed as PPs. The variation facts to be introduced in section 6 clearly show that datives require a separate explanation and cannot be subsumed under the explanation for PPs.

Any analysis of resumption is normally confronted with the following paradox: Resumptive constructions do not obey locality constraints,⁷ but at the same time pass certain movement diagnostics such as Strong Crossover (SCO) and reconstruction.⁸ If one adopts a movement analysis, one will need a special explanation for the absence of locality effects; on the other hand, a base-generation analysis will need a new mechanism to account for movement effects like reconstruction and SCO. Aoun et al. (2001) have argued that this paradox does not obtain in Lebanese Arabic, where reconstruction patterns with locality: Reconstruction is only observed if the resumptive pronoun is located in a position from where movement would in principle be possible. When resumptive pronouns occupy positions from where extraction is impossible, there is no reconstruction. Such a state of affairs argues for a movement analysis in the first case and a base-generation analysis in the second (see Bianchi 2004 for a similar argument). However, reconstruction effects do not always pattern with locality. Guillot & Malkawi (2006) and Guillot (2007) have shown that reconstruction into islands is possible in Jordanian Arabic and French, respectively. At least for such languages, the paradox remains.

The same holds for Swiss German: Reconstruction and SCO effects systematically obtain in resumptive relatives, and reconstruction into islands is possible as well. Here are a few examples with resumptive pronouns inside strong islands, i.e. PPs some of which are embedded in another island (for more data cf. Salzmann 2006, to appear b). (8a/b) illustrate reconstruction, (8c) is an example of SCO. Of course, examples like (8b/c) are very complex and difficult

⁷ This is not correct for all languages. In some, resumptive constructions are sensitive to locality, cf. e.g. Boeckx (2003: 108ff.) for Swedish and Vata, Goodluck and Stojanovic (1996) for Serbo-Croatian, and Rouveret (2008) for Welsh. For those, a movement analysis, or at least an analysis in terms of Agree, seems preferable.

⁸ For Strong Crossover cf. McCloskey (1990) and Shlonsky (1992); for reconstruction see e.g. Aoun et al. (2001), Bianchi (2004), Guillot & Malkawi (2006), Guillot (2007), and Rouveret (2008).

to process. However, their (potential) degradedness cannot be related to locality since (8a), where reconstruction is readily available, also constitutes a strong island (the external head is enclosed in square brackets; the reconstruction site is indicated by means of underline).

- (8) a) D [Ziit vo **sim**_i Läbe], wo **niemert**_i gern **drüber** redt,
 the time of his life C nobody likes.to there.about talks
 isch d Pubertät.
 is the puberty
 ‘The time of his_i life that nobody_i likes to talk about is puberty.’
- b) de [Abschnitt vo **sim**_i Läbe], won i < d Behauptig,
 the period of his life C I the claim
 dass **jede Politiker**_i stolz **druf** isch > nöd cha glaube
 that every politician proud there.on is not can.1SG believe
 lit.: ‘the period of his_i life that I cannot believe the claim that every
 politician_i is proud of’
- c)* de [**Bueb**]_i, won **er**_i für en Fründ vo **im**_i es Auto gschtole hät
 the boy C he for for friend of him a car stolen has
 lit.: ‘the boy_i who_i he_i stole a car for a friend of’ (SCO)

I will adopt a base-generation approach here, not because it easily solves the paradox, but rather because it is eventually confronted with fewer difficulties: On a descriptive level, locality is quite well understood: Movement operations are subject to certain constraints no matter how they are captured theoretically. With reconstruction, things are much less clear. Reconstruction is also found in constructions without a direct movement relationship between the reconstructee and the reconstruction site. This holds e.g. generally for relative clauses (unless a Raising analysis is adopted) and pseudoclefts (den Dikken et al. 2000: 42):

- (9) What **nobody**_i bought was a picture of **his**_i house.

Nobody and the bound pronoun *his* are not part of the same clause and there is no obvious movement relationship that could reconstruct *nobody* into the same

clause as *his* (see den Dikken 2006, section 6 for an overview over possible analyses).

Furthermore, certain instances of scope reconstruction in relative clauses cannot be explained by reconstruction, cf. e.g. Sharvit (1999), Cecchetto (2005), Hulseley & Sauerland (2006):

(10) The woman every man_i loves is his_i mother.

The multiple-individual reading (a different woman for every man) cannot result from reconstructing the external head of the relative since the QP binds a pronoun in the matrix clause. Rather, some other mechanism is necessary. This could be QR of the QP (Hulseley & Sauerland 2006) or an analysis in terms of indirect binding (Sharvit 1999, Cecchetto 2005). But once such mechanisms are necessary anyway and thus in principle available, reconstruction is no longer needed to account for reconstruction for variable binding and scope.⁹

The parallel between movement and reconstruction is thus obviously not perfect so that alternative mechanisms are necessary anyway. Before I turn to these and lay out how they account for the movement effects, I briefly need to sketch my assumptions about base-generation.¹⁰

⁹ See also Cecchetto (2005) for convincing arguments that reconstruction in relative clauses should generally not be accounted for in terms of the copy theory of movement.

¹⁰ The test case to tell apart movement and base-generation would involve reconstruction into intermediate positions. Such interpretations would be unexpected under base-generation since the reconstructee (i.e. the external head) would not be related to such a position. The reconstruction mechanisms for base-generation discussed below lead to reconstruction to the tail of the A'-dependency since the external head is only related to the resumptive (mediated by the operator). With successive-cyclic movement, on the other hand, reconstruction into intermediate positions is expected to obtain. I discussed a number of cases in Salzmann (2006: 341–345), but the results are not clear enough to derive any conclusions from them. The problem is more general in that reconstruction into intermediate positions is generally degraded in German and its varieties, cf. Salzmann (2006: 92ff.). For resumption in other languages, it has sometimes been claimed that cyclicity effects disappear, i.e. reconstruction is always to the tail of the A'-dependency, cf. Rouveret (2008: 186) for Welsh.

4.2 The syntax of base-generation

I will make very few assumptions about base-generation: As in traditional analyses, an operator base-generated in an operator position binds a pronoun in an argument position. As a consequence, this operator must not have a case-feature that needs to be checked. I therefore propose that such an operator is not case-marked and only has an [Op] feature that is checked against the corresponding uninterpretable feature on C. When a case-marked operator is chosen, a movement derivation will result because it can check both the case feature of v/T and the [Op] feature of C. The two possibilities schematically look as follows:

- (11) a) $[_{CP} \text{Op}_i \quad C \quad [_{VP} [_{VP} \text{pron}_i \text{ V}] \text{ v}]]$ base-generation
 [Op] [ease]
- b) $[_{CP} \text{Op} \quad C \quad [_{VP} [_{VP} \text{Op V}] \text{ v}]]$ movement
 [Op/ease] [Op/ease]

4.3 Accounting for movement effects under base-generation

To my knowledge, there are basically two types of mechanisms that have been explored to handle movement effects for base-generated dependencies: semantic reconstruction (cf. Sternefeld 2000 for an overview) and the NP-ellipsis analysis of resumptive pronouns (Guilliot & Malkawi 2006, and Rouveret 2008). In the latter, the resumptive is reanalyzed as a transitive determiner whose NP-complement has been elided under identity with an antecedent (PF-deletion is henceforth indicated by means of outline): $[_{DP} \text{ D NP}]$. This would give the following schematic representation for an example like (8a) (strikethrough indicates LF-deletion; since only NP-parts are LF-deleted, no problems arise for thematic interpretation; English words are used for ease of presentation):

- (12) the [~~time of his_i life~~] [[Op ~~time of his_i life~~] C nobody_i likes to about
 $[_{DP} \text{ it } [_{NP} \text{ time of his_i life}]]$ talk]

Importantly, this only works in the present context if the Matching Analysis of relative clauses is adopted as e.g. in Salzmann (2006, to appear b), where the relative operator is just a D-element taking an NP complement which is elided under identity with the external head. Reconstruction effects are thus not per se a problem for a base-generation analysis.

The same holds for SCO effects; they could also be handled by means of the NP-ellipsis theory of resumptives: In examples like (8c), the resumptive *im* would have *Bueb* ‘boy’ as its NP complement. As it would end up in the c-command domain of the co-indexed *er* ‘he’, the sentence is out due to a violation of Principle C, as under a movement derivation. More traditional approaches like McCloskey (1990) and Shlonsky (1992) define SCO on the basis of the A’-chain linking the operator with the resumptive pronoun. An SCO effect in an example like (8c) would then be due to the fact that the chain between the base-generated operator and the resumptive crosses a pronoun with the same index (again, I use English words for ease of presentation):

(13) * the boy_i, Op_i C he_i for a friend of him_i a car has stolen

I will therefore adopt a base-generation approach.¹¹ For detailed discussion of the problems that arise with a movement account, cf. Salzmann (to appear b).

¹¹ Cf. van Riemsdijk (1989) for an earlier proposal in terms of base-generation. Apart from many technical differences largely due to the development of syntactic theory over the last twenty years, there is one point where I crucially differ from van Riemsdijk: Van Riemsdijk proposes that SU- and DO-relatives also involve resumptive pronouns, which, however, are fronted and then undergo deletion. In Salzmann (to appear a: section 4.2.1) I have rejected such an analysis among others because gap relatives allow scope reconstruction much more readily than resumptive relatives. This is unexpected if the difference between gap and resumptive relatives is only a matter of PF.

Furthermore: Relatives where non-individual-denoting types like predicates or amounts are relativized, e.g. cases like (4a), cannot be analyzed as involving fronting and deletion of a weak pronoun: The only potential proform that could be used in such a case, *das* ‘that’, is arguably not weak enough to front and undergo deletion. In amount relativization there is no proper proform at all so that a movement analysis is the only option for those. But if

5 Implementation – comparing OT and MP

In this section, I will sketch the basic derivations for the three contexts *islands*, *datives*, and *subjects/direct objects* both in an OT and in an MP framework.

5.1 Scenario 1: islands

I have argued above that in island contexts, the resumptive derivation is a last resort since the gap derivation fails. This translates differently into OT/MP: In MP, the movement derivation crashes since it violates a derivational locality constraint. Only the base-generation derivation converges and thus emerges as the only grammatical variant. In OT, both derivations compete with each other, i.e. belong to the same Candidate set (see 5.5 on the definition of the Candidate Set). Grammaticality is thus not the result of convergence of just one candidate, but rather of its optimality. In the case at hand, the resumptive candidate wins because it satisfies a higher-ranking constraint than the gap candidate. The following two constraints are relevant for the case at hand:¹²

- (14) a) LOCALITY: Movement must not cross islands
 b) *RES: Resumptive Pronouns are prohibited (cf. Müller & Sternefeld 2001: 41)

(14a) is a gross simplification, of course. The concept of island used here is best understood in the sense of the generalized adjunct condition (cf. e.g. Boeckx 2003). The distinction between weak and strong islands will be ignored for ease of presentation.

(14b) penalizes resumption. *RES is a constraint that simply penalizes resumption, which in the case at hand amounts to penalizing base-generation. It

movement is necessary anyway, there is good reason to assume movement for SU- and DO-relatives as well.

¹² OT-constraints will henceforth appear in small capitals, MP-constraints only with capitalized initials.

is thus different from SILENTRACE by Pesetsky (1998) where resumptives are viewed as the phonetic realization of traces. For obvious reasons SILENTRACE cannot easily be extended to base-generation. Furthermore, the possessor relativization facts discussed in Salzmann (to appear b) show that what is crucial is not just a ban against variables with phonetic content, but against resumption/base-generation per se as there are also silent resumptive pronouns (cf. also, e.g., Georgopoulos 1985 and McCloskey 1990 for evidence for silent resumptives). This automatically implies that reference to the Avoid Pronoun Principle (as in Chomsky 1982: 63f., van Riemsdijk 1989, Heck & Müller 2000: 44) is also undesirable since that constraint just prefers silent over overt pronouns rather than penalizing resumption/base-generation per se.¹³ *RES is thus not a classical representational economy constraint. In fact, there is clear evidence that it should be set apart from structural economy: Resumptive pronouns are unmarked in many languages of the world (treating them as marked with respect to movement is the result of a eurocentric, standard language-based perspective) and often constitute the first relativization strategy acquired by children (cf. Goodluck & Stojanovic 1996). For pronouns, on the other hand, one can formulate universal hierarchies (e.g. from stressed to zero) that are relevant in some way in every language. Additionally, resumptive pronouns are themselves subject to structural economy constraints. Depending on the context they can appear as full, weak, clitic or zero pronouns (cf. Salzmann, to appear b). Whether movement or resumption is the default or whether both strategies are equally economical is determined by the relative ranking of *RES with respect to STAY/*MOVE (the first type of language

¹³ In fact, footnote 31 in Müller & Sternefeld (2001: 60) suggests that this is also how they interpret their constraint RES. I would like to stress, therefore, that my interpretation is crucially different: The constraint *RES simply penalizes resumptives/base-generation. It is for this reason that I write *RES instead of RES.

mentioned in 3 suggests we are dealing with a tie). For the Alemannic varieties we can assume the ranking $*RES \gg STAY$ (they thus belong to the second group mentioned in 3). For ease of exposition I will omit *STAY* in the tableaux.¹⁴

Given that in an island context only the base-generation derivation is possible, satisfying *LOCALITY* is obviously more important than avoiding resumptive pronouns. This follows if *LOCALITY* outranks $*RES$:

(15) Island context

	<i>LOCALITY</i>	$*RES$
☞ a. Base-generation		*
b. Movement	*!	

Given the two constraints one expects there to be languages with the reverse ranking $*RES \gg LOCALITY$; this would basically mean that these languages could freely violate locality constraints (only, of course, if the constraint requiring checking outranks *LOCALITY*). Such languages are, however, not attested. See section 6.3 for a solution to this problem.

Another question that arises in this context concerns languages like Standard German or Dutch which do not seem to have any options in an island context. A violation of locality is not tolerated, and neither is a violation of $*RES$, as these languages cannot make use of resumptive pronouns. In other words, this is a case of absolute ungrammaticality/ineffability. There are various ways of handling absolute ungrammaticality within Optimality Theory, cf. e.g. Müller (2000: 82ff.) and Müller & Sternefeld (2001: 48ff.). Given the conclusions to be

¹⁴ Légendre et al. (1998) use the faithfulness constraint *FILL* that disfavors epenthesis to penalize resumptives. As I will argue for an input-free definition of the Reference Set in 5.5 below and will generally dispense with faithfulness constraints, this is not an option. The issues touched upon in this paragraph are discussed in detail in Salzmann (to appear c) where it is attempted to subsume the ban against resumption/base-generation under more primitive notions such as the ban against external Merge.

reached in 6.3 about the architecture of grammar, I favor a solution where the Generator simply cannot generate any candidates in that context.¹⁵

5.2 Scenario 2: datives

Datives work similarly: In MP, only the resumptive derivation converges. The gap derivation violates a PF-constraint/filter requiring the realization of oblique case, which I will term *RealizeObl*. As shown in (6)–(7), such a constraint is independently necessary. Importantly, in MP violation of *RealizeObl* will lead to ungrammaticality. The corresponding OT-constraint only differs from it in that it is violable:

(16) *REALIZEOBL*: Oblique case must be phonetically realized

REALIZEOBL outranks **RES* so that we get resumption for datives:

(17) Dative relatives

	<i>REALIZEOBL</i>	<i>*RES</i>
☞ a. Base-generation		*
b. Movement	*!	

OT-accounts dealing with the left-periphery of relative clauses such as Pesetsky (1998) and Broekhuis & Dekkers (2000) assume that the syntactic basis of restrictive relative clauses universally involves an overt relative pronoun + an overt complementizer both of which can be subject to deletion. Under such

¹⁵ In Salzmann (to appear b) I relate the possibility of resumption to the presence of case-unmarked operators in a given language (cf. Merchant 2004 for a similar view). In Salzmann (to appear c) I additionally explore the possibility that there *are* options in island contexts for languages like Dutch/Standard German, namely what I called resumptive prolepsis in Salzmann (2006): Simplifying somewhat, instead of direct movement from an embedded clause, the dependency between operator and theta-position is established indirectly via short A'-movement in the matrix clause and binding:

i) [Von wem_i]_j glaubst du ___j, dass Maria jedes Buch mag, das er_i hat?
 of who believe you that Mary every book likes that he has
 lit.: Who do you think that Mary likes every book that has?'

premises, the question arises why oblique case cannot be realized by a relative pronoun in Spec, CP in Alemannic relatives. One cannot say that there simply is a silent relative operator. Rather, the absence of overt relative pronouns should follow from constraint interaction; or to put it differently: The inventory of relative elements is the result of evaluation and not just simply given by the lexicon. As suggested to me by Hans Broekhuis (p.c.), one possibility involves the constraint LE(CP), which favors CPs whose first element is an overt complementizer. If this constraint dominates REALIZEOBL, the possibility of realizing oblique case in Spec, CP is ruled out. Other things being equal, this basically implies that there are never overt relative pronouns in Alemannic dialects. RECOVERABILITY, which outranks LE (CP), is arguably only an issue for datives and PPs. Due to the high ranking of LE(CP) and the low ranking of *RES, recoverability is satisfied by means of resumption in these varieties.¹⁶

5.3 Scenario 3: subjects/direct objects

Intuitively, gap derivations are preferred over resumptive derivations in this context because they are more economical. It is, however, not trivial to capture

¹⁶ I remain somewhat skeptical as to the necessity of such a step. First, positing relative pronoun + complementizer as the universal basis for relative CPs is blatantly eurocentric; given that relative pronouns are a phenomenon of standard languages, but are typologically less common than other relativization strategies, this seems an undesirable move. Second, from the point of view of language acquisition, positing overt relative pronouns which are always deleted on the way to the surface would arguably be problematic. According to Broekhuis & Dekkers (2000: 399f.) the possibility of deleting a relative pronoun depends on whether it is meaningful, i.e. whether it has marked features. For Alemannic dialects, this would imply that relative pronouns never contain any meaningful (marked) features so that they can always be deleted. But this is probably just a very indirect way of saying that the dialects in question simply have silent relative operators without any features that require phonetic realization. Positing empty operators thus arguably derives at least as good a result as abstract but never surfacing relative pronouns like the *that* used in Broekhuis & Dekkers (2000: 403). The data discussed in Broekhuis & Dekkers (2000: 415ff.) may in fact provide evidence in favor of silent operators after all.

Eventually, the issue depends on how empty elements are handled in syntax. If they are invariably the result of a deletion operation, as is assumed in much work on OT-syntax, an approach as sketched in the main text is inevitable.

this theoretically, at least not in MP terms. This is why I start with the OT evaluation: As discussed in 5.1, the ban against resumption should be set apart from pure structural economy. In a context where no constraint requires overt realization, a resumptive derivation will violate *RES while the gap derivation does not and thus emerges as optimal (recall from 5.1 that *RES also dominates STAY; the intuition about movement being more economical is thus only expressed by the ranking *RES >> STAY, as there is no connection with structural economy):

(18) Relativization of subjects/direct objects ¹⁷

	REALIZEOBL	*RES
a. Base-generation		*!
☞ b. Movement		

It is very difficult to find a good MP-constraint for this scenario. Since both the movement and the base-generation derivation converge, one would need an Economy constraint to select one of the two as the grammatical one. While the notion of Economy has played an important role in the development of the Minimalist Program, there does not seem to be a well-established constraint one could use for the case at hand. The only related constraint that has been proposed within the P&P tradition is the Avoid Pronoun Principle. As discussed in 5.1, it cannot be easily extended to relativization because the choice is strictly speaking not between overt and null pronoun but simply between movement and base-generation, i.e. it is not a case for structural economy.¹⁸ For present

¹⁷ Relativization of predicates in transparent positions as in (4a) works the same.

¹⁸ Aoun et al. (2001) argue that base-generation is less economical than movement because it involves more operations, i.e. because it involves greater derivational complexity. Apart from the fact that there has been a strong tendency in recent years to do without transderivational economy constraints (cf. Müller & Sternefeld 2001), it is far from obvious that such a constraint would work for the implementation of base-generation proposed here. Aoun et al. (2001) propose a very different implementation of base-

purposes, I will simply use an MP equivalent of *RES, i.e. *Res. This constraint compares two PF-representations of converging derivations (i.e. it is a translocal constraint). In the case at hand it selects the one without resumptive pronoun.¹⁹

5.4 Location of the constraints and last resort

The previous sections have shown that MP and OT locate the relevant constraints in different parts of the grammar. In OT, all constraints are part of the Evaluator and are equally violable. In MP, however, we have a derivational constraint (Locality),²⁰ a representational constraint (RealizeObl) and a translocal constraint (*Res). The first two are inviolable, the third one only comes into play when there is competition, i.e. when there are several converging derivations in the same Reference Set.

Similarly, the notion of last resort is captured in very different ways. In OT, last resort simply means that a certain candidate is selected because it has a better constraint profile than the other ones. In other words, last resort is a relative concept. In MP, it depends on the configuration. For islands and datives, last resort means that the resumptive derivation is the only one that converges, i.e. last resort is an absolute notion. For subject/direct object relativization,

generation a full discussion of which is beyond the scope of this paper. See Salzmann (to appear b,c) for arguments against Aoun et al.'s (2001) approach.

¹⁹ Under the assumption that this economy constraint – like other MP-constraints – is essentially universal, one arrives at the prediction that resumption is universally more marked than movement. Given the arguments in 5.1 that resumption is just as unmarked as movement, this is highly undesirable and points out a serious weakness of the MP-constraint system. The same applies to the approach by Aoun et al. (2001) in terms of derivational economy. Economy constraints in the MP fail to adequately address the fact that languages simply differ as to whether movement or base-generation is the default or whether there is a free choice between the two (in certain environments) as in Irish or Hebrew. This kind of language variation is completely unexpected under such an approach. In Salzmann (to appear c) these issues are discussed in detail.

²⁰ On a more representational MP-approach, Locality could, of course, also be a representational constraint.

however, it is a relative one because there are competing derivations of which the one that satisfies *Res is chosen as the more economical option.

An OT approach thus handles all cases consistently while in the MP the three cases are essentially given a somewhat different explanation. The implications of this will be discussed in 6.3.

5.5 Definition of the Reference Set/Candidate Set

For the present analysis to work, base-generation has to compete with movement. In OT, this holds for all three contexts, in MP, this only holds for the SU/DO case. This has far-reaching consequences for the definition of the Candidate Set (CS)/Reference Set (RS), i.e. the set of derivations/representations that compete with each other: The definition of the RS/CS is by no means trivial and there is to date no generally accepted definition. While it is still often assumed that the RS/CS is determined by the numeration, the set of lexical items used for a derivation, I believe that there are good reasons not to do so, as pointed out in Sternefeld (1997), Broekhuis and Dekkers (2000), Heck et al. (2002), and Broekhuis and Klooster (2007). In the case at hand, basing the CS/RS on the numeration would not work since movement and base-generation structures arguably involve different numerations (pace Aoun et al. 2001, cf. Salzmann to appear b,c). Rather, the Swiss German facts suggest that the CS/RS should be based on the same LF.

At LF, a movement and a base-generation derivation will look very similar: Intermediate copies will have been deleted, and the lower copy of the movement chain will be converted into a variable. Similarly, the resumptive pronoun will also function as a variable through binding by the operator:

- (19) a) $[_{CP} Op_i \dots x_i]$ movement
 b) $[_{CP} Op_i \dots pron_i]$ base-generation

I take these two LFs to be sufficiently similar for both to be part of the same Candidate/Reference Set (cf. Salzmann to appear b,c for detailed discussion).²¹

6 The problem of variation

So far OT and MP seem to make the same predictions and analyze the data equally well. However, once dialectal, inter- and intra-speaker variation are taken into account, the picture changes. I will first discuss variation between different linguistic systems before I turn to variation within the same system.

6.1 Crosslinguistic/dialectal and inter-individual variation

6.1.1 *The descriptive facts*

Most traditional descriptions of Alemannic claim that dative relatives require a resumptive pronoun, cf. Bossard (1962: 141) for Zugovian, Fischer (1989: 429) for Lucerne, Hodler (1969: 246) and Marti (1985) for Bernese, Sonderegger & Gadmer (1999) for Appenzell, Suter (1992: 183) for Basel, and Weber (1964: 299) for Zurich German.

However, there are exceptions: The Low Alemannic dialect of Oberrotweil (Germany), which is typologically very similar to the Swiss German varieties, has basically the same resumptive system as the Swiss German dialects, with gaps for subjects and direct objects and resumptive pronouns for PPs; but crucially, there are no resumptive pronouns for datives, as shown in the grammatical description by Noth (1993: 418ff.):

²¹ One caveat is in order here: It has been pointed out that resumptive pronouns impose semantic restrictions on the external head, i.e. that they block scope reconstruction, cf. Sharvit (1999), Boeckx (2003), Bianchi (2004). This has, of course, implications for the definition of the Reference Set if it is based on the notion of “same LF”. The scope facts in Zurich German resumptive relatives are too complex to discuss here, cf. Salzmann (2006). The theoretical consequences are discussed in detail in Salzmann (to appear c).

- (20) a) Alli, wun em ____{ACC} hab wellá machá, sí mr vrgroodá.
 All C he.DAT have wanted make are me.DAT failed
 ‘All (e.g. cakes) that I tried to make for him, turned out bad.’ DO
- b) Sáli Firma, wu dr Sebb noch ____{DAT} ebis schulded,
 that firm C the S. still something owes
 hed scho wíder aagruáfa.
 has already again called IO
 ‘That company to which Sebb still owes something has called again.’
- c) Dr áinzig, wu si vrhandlá **mí**d **em**, ísch dr Aafíarer.
 the only.one C they negotiate with him is the leader
 ‘The only one with whom they negotiate is the leader.’ PP

The same seems to be the case in Glarus German. Bábler (1949: 60), a textbook to learn the local dialect, gives five examples with dative relativization all of which contain gaps. Otherwise, the resumption system is the same as in Zurich German. Here is one of the examples of dative relativization:

- (21) Kánntscht du der Bueb, ...wo me ____{DAT} de es Breimi gih het?
 know.2sg you the boy C one then a prize given has
 ‘Do you know the boy to whom they then gave a prize?’

Importantly, the variation cannot be related to a different status of dative case in these varieties. As in Zurich German, dative has to be overtly realized in the contexts (6)–(7). Neither can the deviating behavior of dative relatives be attributed to the types of datives: Noth (1993) and Bábler (1949) list examples with datives of various types: datives of ditransitive verbs, of intransitive verbs, subcategorized datives and non-subcategorized ones (bene-/malefactive). In other words, the dialectal variation is real.

More evidence for variation comes from the *Idiotikon* (1999, XV, 13f.), a dictionary of Swiss German dialects. The entry of the relative particle *wo* contains several examples with dative relatives, some of which are constructed with a resumptive pronoun and some without. All the examples are taken from careful written sources such as textbooks, grammatical descriptions, dialect

literature etc. The examples without resumptive pronoun come from the following dialects: Bernese, Appenzell, Glarus, and Wallis German while those with resumptive pronoun are from Basel, Bernese, Zugovian, and Lucerne German. The fact that we find both variants in Bernese suggests that the variation is not just between larger dialect areas but also occurs among individuals of the same variety; i.e. we are dealing with inter-speaker variation. More evidence for inter-speaker variation is found in Hodler (1969: 246), who notes that the resumptive pronoun is normally obligatory in Bernese, but (for reasons he does not specify) sometimes does not occur. Similarly, while Sonderegger & Gadmer (1999) explicitly state that dative resumptive pronouns are necessary in Appenzell German, one of the examples in the *Idiotikon*, which is undoubtedly from the same dialect (by the author Jakob Hartmann), does not contain a resumptive pronoun. Since the conflicting examples without resumptive pronouns occur in contexts where the grammatical descriptions normally take dative resumptive pronouns to be obligatory, the variation cannot be due to different types of dative. Rather, we seem to be dealing with true inter-speaker variation (in Salzmann to appear a, section 5, the empirical situation is discussed in more detail).

6.1.2 Why an MP approach must remain unsatisfactory

In current Minimalist work, crosslinguistic variation (including idiolectal variation) is usually reduced to differences in the specification of lexical items or differences in the inventory of lexical items. Quite often variation is linked to differences in feature strength/interpretability of some functional head which will trigger overt movement in one language but not in another. Since in the case at hand we are not dealing with differences in displacement, feature strength/interpretability cannot be at stake. Rather, the crosslinguistic variation must root in the presence vs. absence of a given lexical item.

At first sight, one might want to argue that the varieties without dative resumptive pronouns simply do not have the required operator so that a movement derivation is the only option for dative relatives. However, this does not work: First, dative resumptive pronouns do occur in all varieties when the dative is inside an island:

- (22) de Maa, won i käs < Buech, won ***(em)** gib>, zrugg überchum
 the man C I no book C he.DAT give back get
 lit.: ‘the man who I don’t get any book back that I give to’

Second, since these varieties use base-generation whenever the variable is inside an island, including PPs, they must have the case-less operator posited in 4.2. This implies that in these varieties both the movement and the gap derivation are an option for datives. The variation in dative resumption thus cannot be due to a difference in the inventory of operators. But how can the absence of dative resumption in transparent contexts be derived?

One possibility would be to assume that there is no *RealizeObl* in those varieties so that gap derivations converge and are preferred over resumptive derivations because of **Res*. But this leads to serious problems, since then one can no longer account for the pattern in (6)–(7). We are thus forced to assume that the general requirement to realize dative case, i.e. *RealizeObl*, still holds in the respective variety. But then this PF-constraint will filter out all derivations where dative remains unexpressed, including dative gap relatives. In other words, dative relatives with gaps cannot be derived given that *RealizeObl* is inviolable. The only possible way out is to make *RealizeObl* more specific so that it no longer applies to relative clauses. In that case, both gap and resumptive derivations will converge. The gap variant then emerges as more economical since it does not violate the Economy constraint **Res*, cf. 5.3. In a non-transparent context such as (22), on the other hand, only the base-generation derivation will converge, not because of *RealizeObl*, but because of *Locality*.

This strategy of positing rather specific constraints is exactly what Broekhuis (2008) criticizes about Chomsky's (2001) treatment of object shift, where the cross-linguistic differences are handled by quite specific PF-filters. As pointed out in Broekhuis (2008), such a strategy is feasible, but amounts to a reformulation of the descriptive generalizations. The difference between varieties with dative resumptive pronouns and those without is then due to a slight difference in the PF-filter *RealizeObl*: It holds across the board in the first group, while in the second, it does not hold for relatives. An MP approach can thus handle the variation, but only at a very high cost.

6.1.3 *Why an account based on violable constraints is superior*

Under an OT account, the variation can be handled straightforwardly: The fact that *REALIZEOBL* does not hold in all contexts is not a problem because it is a violable constraint. In the case at hand, we can argue that the absence of dative resumptive pronouns is due to a different ranking between *REALIZEOBL* and **RES*. While *REALIZEOBL* dominates **RES* in the varieties with dative resumptive pronouns, the reverse ranking obtains in the dialects/idiolects without dative resumptive pronouns:

(23) Dative relatives without resumptive pronouns

	<i>*RES</i>	<i>REALIZEOBL</i>
a. Base-generation	<i>*!</i>	
☞ b. movement		<i>*</i>

The obligatoriness of dative resumptive pronouns in islands like (22) follows if *LOCALITY* dominates the two constraints **RES* and *REALIZEOBL*.

One might object that this solution is just as descriptive as the MP-analysis in the previous subsection. But this is certainly not correct: The OT approach fares better in a number of important aspects: First: In the OT-account, the variation is derived from primitive notions of grammar: All constraints are

very general and independently needed while in the MP-account, the variation is handled by means of a general and a more specific filter. Second, the OT description is more economical in that only three constraints are needed: LOCALITY, *RES and REALIZEOBL. The MP-account of the previous subsection, however, requires the derivational constraint Locality, an Economy constraint *Res and two versions of RealizeObl: One that applies across the board and one that does not apply to relative clauses. Third, the OT approach makes interesting predictions about possible types of language: Given the constraint set, one does not expect to find a language that consistently uses dative resumptive pronouns, but leaves dative unexpressed in contexts like (6)–(7). To my knowledge, this prediction is correct. Under an MP-account with very specific filters, it would be easy to formulate a constraint that leads to such an unattested patterns. I conclude, therefore, that an approach based on violable constraints is superior.

6.2 Intra-speaker variation

6.2.1 *The descriptive facts*

The data presented so far show that the use of dative resumptive pronouns is much less systematic than suggested by earlier descriptions. Two recent studies (Salzmann, to appear a, on Zurich German, and Salzmann & Seiler in prep. on Swiss German) have not only confirmed this fact, but rather show that variation in dative resumption is pervasive: Not only do speakers of the same variety differ from each other in their use of dative resumptive pronouns, there is also a lot of variation within the grammar of an individual: Most speakers judged both the gap and the resumptive version grammatical. In other words: The use of dative resumptive pronouns is essentially optional. Importantly, the variation is restricted to dative relativization in transparent contexts. In island contexts, dative resumptive pronouns are obligatory. In other grammatical relations, the

result is also categorical and confirms the earlier descriptions: Resumptive pronouns are prohibited for subjects and direct objects, but necessary for PPs and islands.

There is no evidence that the variation is related to sociolinguistic factors like age, sex, education etc. One cannot simply say that younger people are less likely to use dative resumptive pronouns. In fact, some of the sources in the *Idiotikon* mentioned above without dative resumptive pronouns are 50-100 years old. Conversely, a quick Google search reveals that dative resumptive pronouns are used frequently in news forums, chat-rooms etc., i.e. in communicative contexts which are most likely to be frequented by younger people. It is neither the case that the variation can simply be attributed to processing factors, e.g. that the resumptive pronoun is dropped in sloppy speech or conversely that the resumptive pronoun is inserted as some repair strategy. As shown in 6.1.1, gaps and resumptive pronouns for datives are found in very carefully written sources such as textbooks, traditional dialect literature etc. It is highly unlikely that those instances represent performance errors. But once gap as well as resumptive relatives are a possibility in the grammar of many speakers of an Alemannic variety, it is unlikely that speakers who use gaps next to resumptive pronouns for dative relatives make performance errors when they use one of the variants. Furthermore, in our questionnaires, the majority of our informants explicitly marked both the gap and the resumptive variant as grammatical. Finally, a processing account would have to assume that one of the variants, the gap or the resumptive pronoun, is the basic variant while the other one is the result of a performance error. Given that both variants are attested in careful sources, cf. 6.1.1, both variants are equally good candidates for the basic variant. Choosing between the two seems not only arbitrary but even wrong. I conclude from this that intra-speaker variation in the use of dative resumptive pronouns is simply a

fact one cannot deny. Both gap and resumptive pronoun are grammatical variants for one and the same speaker.²²

6.2.2 *Why an MP-approach fails and an OT-approach succeeds*

Given that both the gap and the resumptive variants are grammatical for many speakers, we need a model of grammar that generates both variants. Within the lexical variation theory there is one recent approach by Adger (2006) that explicitly tackles intra-speaker variation. Simplifying somewhat, he proposes that variation within a grammar arises if a grammar contains two featurally different, but semantically identical elements that – due to their feature difference – are realized differently in the morphological component. Depending on which element is chosen for a given derivation, we get either variant a or b.

The discussion on dialectal variation in 6.1.2 has shown, however, that the variation cannot be located in the inventory because all varieties have both gap and resumptive relatives and therefore require both a case-marked (for movement: SU/DO) and a case-unmarked operator (for base-generation: PPs, islands). The question is whether intra-speaker variation can be explained by the presence of both relative operators. In the case at hand it cannot, for principled reasons: In Adger's approach the differences in the numeration are taken to be significant enough to constitute two different Reference Sets so that two given (converging) derivations will not compete and can both emerge as grammatical, thereby leading to optionality. However, as discussed in section 5, since the

²² This is not to say that the distribution of gap vs. resumptive pronoun is completely random and free of processing effects. As discussed in Salzmann (to appear a, section 5.4) and Salzmann & Seiler (in prep.) there are a number of configurations where the gap variant is preferred: in matching contexts and with inanimate/non-referential head nouns. To what extent those factors are hard grammatical constraints or just soft/processing-related constraints and how they should be integrated into a model of grammar is something I wish to investigate in future research. See Salzmann (to appear a: section 6.3) and Salzmann & Seiler (in prep.) for first results.

Candidate/Reference Set must be determined on the basis of LF to explain the resumption facts, there will always be competition between gap and resumptive derivations. The optionality thus cannot result from different inputs. Rather, it must somehow be the result of PF-constraints. As discussed in section 5, the general version of the MP-constraint *RealizeObl* will be too strong when dative relatives contain gaps: Derivations with gaps violate *RealizeObl* and therefore crash so that only the resumptive variant should be grammatical. The same problem obtains in intra-speaker variation: With the general *RealizeObl*, derivations with gaps violate *RealizeObl* and therefore crash. Again, only the resumptive derivations should be grammatical, contrary to fact. The only alternative is to use the specific version of *RealizeObl*, which in principle allows both gaps and resumptive pronouns for datives. But even that will not do: Even though both gap and resumptive relatives converge in that case, the MP-constraint **Res*, which is independently necessary to rule out resumptive pronouns for subjects and direct objects (cf. 5.3), will favor the gap variant for reasons of economy. In other words, it is simply not possible for this type of grammar to generate both variants.²³

In an OT approach, optionality in transparent contexts follows straightforwardly from a tie between *REALIZEOBL* and **RES*. Both gap and resumptive pronoun can thus be optimal:

(24) Optionality in dative resumption: *REALIZEOBL* \diamond **RES*

Within islands (22), the resumptive variant is the only possibility because *LOCALITY*, which outranks the two tied constraints, can only be satisfied by resumption/base-generation.

²³ Nothing changes under a movement approach to resumption. Gap and resumptive derivations would be part of the same Reference Set and would thus compete in dative relatives. But because of **Res* only the gap variant would be grammatical, contrary to fact.

6.3 Why only datives? Arguments for a restrictive generator

There are two aspects that raise doubts about the validity of the OT-approach presented here: Given the three constraints LOCALITY, REALIZEOBL and *RES it is easily possible to come up with a ranking that will lead to a language that arguably does not exist: Suppose the following ranking: REALIZEOBL >> *RES >> LOCALITY. This would lead to a typologically unattested language, which has dative resumptive pronouns but no resumptive pronouns when the extraction site is inside an island (which implies that there would be movement out of islands). This is clearly undesirable. An MP approach is not confronted with this problem because locality is hardwired into the derivational system so that derivations that violate locality will invariably crash.

Furthermore, it is completely arbitrary under the OT approach that variation is restricted to datives. With the OT formalism it is just as easy to model a language where resumptive pronouns inside islands are optional, e.g. with a tie between *RES and LOCALITY. Again, this problem does not arise under an MP-approach since the constraints that lead to variation do not apply to the computational system but to PF-representations. This captures the fact that the variation we find in Alemannic relatives is restricted to interface phenomena (the realization of oblique case) rather than fundamental syntactic properties, thereby echoing the dichotomy between core and periphery. This insight is completely lost in the present OT account. Basically any kind of variation may be possible, contrary to fact.

Since I have shown that the violability of certain constraints is necessary for a correct description of the facts, I do not want to give up an account based on violable constraints altogether. Rather, I would like to propose an alternative that preserves the insight of the analysis while at the same time helps restrict the possible grammars (and thus the range of variation): Locality constraints on

movement, at least those banning movement from strong islands, are reanalyzed as part of the Generator (e.g. some version of the CED or phase theory). As a result, the grammar will never generate sentences that violate such islands. In the case at hand, this will correctly limit the variation to the realization of oblique case, an interface constraint. The Derivations & Evaluations model proposed by Broekhuis (2008) provides exactly the necessary architecture to implement such an approach: It combines an MP-generator with an OT-like evaluator that includes economy constraints (such as STAY) and interface constraints (like REALIZEOBL). Constraints that are never violated, e.g. the prohibition to move out of strong islands, are built into the MP-generator. This accounts for the universal properties of human language while the Evaluator is responsible for cross-linguistic, and as we have seen, inter- and intra-speaker variation. The architecture thus echoes the old core-periphery dichotomy and is directly compatible with the recurring observation that variation, especially micro-variation, is (apart from differences in the lexical inventory) often limited to interface constraints and the presence or absence of overt displacement.

7 Conclusion

Dialectal, inter- and intra-speaker variation in dative resumption in Alemannic varieties of German clearly shows that ranked violable interface constraints are descriptively and explanatorily superior to the PF-filters used in recent Minimalist work. At the same time, the range of variation can be better restrained if certain properties of language are not taken to be the result of constraint interaction, but rather of a restrictive Generator. In this respect the facts discussed here argue for a combination of some elements of both the Minimalist Program and Optimality Theory, as, e.g., proposed in the Derivations & Evaluations framework by Broekhuis (2008).

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Preposition Insertion in the Mapping from Spell-Out to PF*

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This paper discusses three case studies on the realization of spurious prepositions and argues that they illustrate a general interaction of convergence requirements of the morphological component with an economy condition that enforces faithfulness between the lexical items present in the numeration and the lexical items present in the PF output.

Keywords: dummy prepositions, inherent Case, syntax-phonology mapping, economy, Parallelism Requirement

1 Introduction

This paper reviews three case studies of syntax-PF mismatches with respect to preposition realization. The first case involves the well-known contrast in English illustrated in (1), where perception and causative verbs appear to select for bare infinitivals in their active form, but for *to*-infinitivals in their passive form.

- (1) a. I saw Mary (***to**) leave
b. Mary was seen ***(to)** leave

The second case of mismatch to be discussed below is illustrated by sentences such as (2) in Brazilian Portuguese (henceforth *BP*), where the

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complement of a verb like *precisar* ‘need’ requires a preposition only if it surfaces *in situ*.

- (2) a. Você precisa ***(de)** quantos livros?
 you need of how-many books
 ‘How many books do you need?’
- b. **(De)** quantos livros você precisa?
 of how-many books you need
 ‘How many books do you need?’

Finally, the third case involves contrasts such as (3) in BP, where the second conjunct of an embedded coordinated subject must surface as a PP if the preposition selecting the infinitival clauses fuses with the first conjunct.

- (3) a. Eu fiquei contente **por a** Maria e **(*por) o** João ganharem
 I was happy by the Maria and by the João win-INF-3PL
 o prêmio
 the prize
 ‘I was happy because João and Maria won the prize.’
- b. Eu fiquei contente **pela** Maria e ***(pel)o** João ganharem
 I was happy by-the Maria and by-the João win-INF-3PL
 o prêmio
 the prize
 ‘I was happy because João and Maria won the prize.’

Assuming the general framework of the Minimalist Program (Chomsky 1995, 2000, 2001), I will show that the contrasts illustrated in (1)–(3) follow from the interaction between convergence requirements and a general economy condition on the mapping from the numeration to PF.

2 P-insertion

The contrast in (4) below is an old riddle of Modern English grammar (see among others Williams 1983, Zagona 1988, Lightfoot 1991, Felser 1998, Hornstein, Martins, and Nunes 2006, 2008, and references therein). At first

sight, it seems that perception and causative verbs select different types of infinitival complements depending on whether or not they are active or passive.

- (4) a. John saw/heard/made them (***to**) hit Fred
 b. There were seen/heard/made ***(to)** hit Fred

Although this is the general line of thought that has been pursued in different forms in the literature, Hornstein, Martins, and Nunes (2006, 2008) (*HMN* hereafter) have recently outlined an alternative approach that keeps selection and syntactic computations constant for active and passive pairs and attributes their differences to computations in the phonological component, after the relevant structures are spelled out.

Their starting point is Nunes's (1995) extension of Raposo's (1987) proposal regarding the Case properties of Portuguese infinitivals to English. Raposo argued that infinitives in Portuguese are nominal projections and as such, they must be Case marked. In (5), for instance, the dummy preposition *de* is required when the infinitival is the complement of heads that do not assign Case, such as the noun *receio* 'fear' in (5b) or the adjective *receoso* 'fearful' in (5c), but not if the subcategorizing head is a Case assigner such as the verb *recear* 'to fear' in (5a).

- (5) a. O rapaz receia (***de**) [chumbar o exame]
 the boy fears of fail-INF the exam
 'The boy fears failing the exam.'
- b. o receio ***(de)** [chumbar o exame]
 the fear of fail-INF the exam
 'the fear of failing the exam'
- c. O rapaz está receoso ***(de)** [chumbar o exame]
 the boy is fearful of fail-INF the exam
 'The boy is fearful of failing the exam.'

Nunes (1995) observed that Old English infinitivals could be described along similar lines, for they function like nominal projections (see Lightfoot 1979) and their overt infinitival morpheme *-an* may show inflection for dative Case, surfacing as *-anne* or *-enne*, when preceded by the preposition *to* (see Callaway 1913). Based on this fact, Nunes (1995) proposes that the infinitival morpheme became null in Modern English but retained its nominal property of requiring Case assignment. Under this view, *to* in (4) is taken to behave like *de* in (5) in being a last resort strategy for Case-marking the infinitival in the absence of a (local) Case-assigner.

HMN reinterpret Nunes's (1995) suggestion within Chomsky's (2001) Agree-based framework, according to which (i) Case-valuation is a reflex of ϕ -agreement between a ϕ -complete probe and a goal DP; and (ii) finite Ts and "transitive" light verbs, which are assumed to bear person and number features, count as ϕ -complete, but participial heads, which are assumed to bear gender and number features, do not. More specifically, HMN propose that the T head of the infinitival complement of perception and causative verbs in English has unvalued number and Case-features (see HMN 2006, 2008 for motivation and discussion), regardless of whether the subcategorizing verb is active or passive. The derivation of an active sentence such as (6), for instance, proceeds along the lines of (7).

(6) I saw Mary leave

- (7) a. [TP T_{[N:u]/[Case:u]/EPP} [VP Mary_{[P:3]/[G:FEM]/[N:SG]/[Case:u]} leave]]
 b. [TP T_{[N:SG]/[Case:u]/EPP} [VP Mary_{[P:3]/[G:FEM]/[N:SG]/[Case:u]} leave]]
 c. [VP V_{[P:u]/[N:u]} saw [TP Mary_{[P:3]/[G:FEM]/[N:SG]/[Case:u]} [T' T<sub>[N:SG]/[Case:u]/~~EPP]~~ [VP *t* leave]]]]
 d. [VP V_{[P:u]/[N:u]} saw [TP Mary_{[P:3]/[G:FEM]/[N:SG]/[Case:u]} [T' T_{[N:SG]/[Case:ACC]/~~EPP]~~ [VP *t* leave]]]]}</sub>

- e. $[_{VP} V_{[P:3]/[N:SG]} \text{ saw } [_{TP} \text{ Mary}_{[P:3]/[G:FEM]/[N:SG]/[Case:ACC]} [_{T'} T_{[N:SG]/[Case:ACC]/\cancel{EPP}} [_{VP} t \text{ leave }]]]]$

In (7a), the head of the infinitival head agrees with *Mary* and has its own number feature valued, as shown in (7b). However, the Case-features of both T and *Mary* remain unaltered, because T does not have a complete ϕ -set (see Chomsky 2000, 2001). After *Mary* moves to [Spec,TP] to check the EPP and the matrix light verb is introduced, we obtain the structure in (7c). *Mary* and T in (7c) are equidistant from the matrix light verb (see Chomsky 1995), as *Mary* is in the minimal domain of the infinitival T. Hence, the matrix light verb can agree with the infinitival T, yielding (7d), and then with *Mary*, yielding (7e), which surfaces as (6) after further computations. Crucially, the matrix light verb remains active after valuing the Case-feature of the infinitival T in (7d), because the ϕ -set of T is incomplete and does not match all the features of the matrix light verb (see Chomsky 2001:15).

In turn, the derivation of a passive sentence such as (8) involves the steps represented in (9).

(8) *Mary* was seen **to** leave

- (9) a. $[_{TP} T_{[N:u]/[Case:u]/EPP} [_{VP} \text{ Mary}_{[P:3]/[G:FEM]/[N:SG]/[Case:u]} \text{ leave}]]]$
 b. $[_{TP} T_{[N:SG]/[Case:u]/EPP} [_{VP} \text{ Mary}_{[P:3]/[G:FEM]/[N:SG]/[Case:u]} \text{ leave}]]]$
 c. $[_{PartP} \text{-en}_{[G:u]/[N:u]/[Case:u]} [_{VP} \text{ see } [_{TP} \text{ Mary}_{[P:3]/[G:FEM]/[N:SG]/[Case:u]} [_{T'} T_{[N:SG]/[Case:u]/\cancel{EPP}} [_{VP} t \text{ leave}]]]]]]]$
 d. $[_{PartP} \text{-en}_{[G:FEM]/[N:SG]/[Case:u]} [_{VP} \text{ see } [_{TP} \text{ Mary}_{[P:3]/[G:FEM]/[N:SG]/[Case:u]} [_{T'} T_{[N:SG]/[Case:u]/\cancel{EPP}} [_{VP} t \text{ leave}]]]]]]]$
 e. $[_{TP} T_{[P:u]/[N:u]/EPP} [_{VP} \text{ be } [_{PartP} \text{-en}_{[G:FEM]/[N:SG]/[Case:u]} [_{VP} \text{ see } [_{TP} \text{ Mary}_{[P:3]/[G:FEM]/[N:SG]/[Case:u]} [_{T'} T_{[N:SG]/[Case:u]/\cancel{EPP}} [_{VP} t \text{ leave}]]]]]]]]]]]$

The steps in (9a) and (9b) are no different from the ones in (7a) and (7b). The situation changes when the step in (9c) is reached. The participial head

associated with passives is ϕ -incomplete in not having a person feature. Hence, although agreement between *-en* and *Mary* in (9c) can take place, as shown in (9d), all the Case features remain unvalued. The final relevant step is shown in (9e), after the ϕ -complete matrix T enters the derivation. The finite T can agree with *Mary* skipping the participial head, for the latter does not match all the ϕ -features of *Mary* (it does not have a person feature). However, *-en* blocks agreement between the matrix and the infinitival T as it matches all the ϕ -features of the infinitival T, namely, its only number feature. The derivation as it stands in (9e) is bound to crash because the infinitival T does not have its Case feature valued.

An important feature of this analysis, as mentioned above, is that the computations of the syntactic component before Spell-Out are the same for both active and passive constructions. It is not the case for instance that they have different selection requirements or that in the case of passives, the infinitival complement first merges with a preposition and then the resulting object merges with the relevant passive verb. The different results between actives and passives with respect to convergence follow from independent minimality computations: long distance agreement between a Case-valuing light verb and the infinitival head in the active versions (cf. (7d–e)) complies with minimality, whereas long distance agreement between a Case-valuing T and the infinitival head in the passive versions (cf. (9e)) violates minimality due to the intervention of the participial head.

By keeping the operations of the syntactic component constant, we have an account for why a sentence such as (8) without *to* is ruled out. Moreover, if *to* is not part of the structure assembled by the syntactic component, we are led to the conclusion that it should be inserted in the phonological component after Spell-Out, given the licit PF output in (8). However, this conclusion brings with

it two questions. First, we have to explain how insertion of *to* in the phonological component can prevent a structure such as (9e) in English from crashing at LF. After all, the Case-feature of the infinitival head in (9e) was not appropriately licensed in the syntactic component and this structure will feed LF.

The second question, related to the first one, has to do with overgeneration. If *to* can Case-license the infinitival head for both PF and LF reasons, why can't it surface in active sentences, as seen in (4a)? Even more puzzling, how can a sentence such as (10a) with the structure in (10b) be filtered out?

(10) a. * It was seen **to** Mary leave

b. $[_{TP} \text{it } T_{[P:3]/[N:SG]/\cancel{EPP}} [_{VP} \text{be } [_{PartP} \text{-en}_{[G:FEM]/[N:SG]/[Case:NOM]} [_{VP} \text{see } [_{TP} \text{Mary}_{[P:3]/[G:FEM]/[N:SG]/[Case:u]} [_{T'} T_{[N:SG]/[Case:u]/\cancel{EPP}} [_{VP} t \text{leave}]]]]]]]]]$

In (10b), the matrix T has valued the Case feature of the participial head, before having its own ϕ -set valued by the expletive and becoming inactive for further agreement relations. Thus, *Mary* and the infinitival head in (10b) remain Caseless. However, given that *to* can rescue the derivation sketched in (9) (cf. (8)) by Case-licensing the infinitival head, it should in principle be able to Case-license *Mary*, as well. Crucially, *Mary* and the infinitival head are equidistant, as discussed earlier. To put it in general terms, why is *to*-insertion so restricted that it gives the impression that the passive versions of perception and causative verbs have different selectional requirements from their active counterparts?

HMN propose that *to* in (8) is actually the morphological reflex of the inherent Case assigned by the matrix V to its infinitival complement. In other words, if inherent Case is assigned during the course of the syntactic computation, the infinitival head has its Case licensed also for LF purposes, thus answering our first question above. Moreover, under the standard assumption

that inherent Case must be associated with θ -role assignment (see Chomsky 1986), the unacceptability of (10a) is also explained. Regardless of the fact that *Mary* and the infinitival head are equidistant, only the infinitival head is θ -marked by *see*; hence, *Mary* in (10a) cannot be Case-licensed by the matrix verb in (10b) and the derivation crashes.¹ As for the ungrammaticality of the active sentence in (4a) with *to*, HMN propose that the realization of inherent Case by means of a preposition is subject to Last Resort: it will be employed only when it must. If the derivation in (7), for instance, can converge without “*to*-insertion” (cf. (6)), *to*-insertion is blocked.

If *to* in (8) is indeed not part of the structure shipped to the phonological component by Spell-Out, we are led to the conclusion that the phonetic realization of spelled out structures is subject to a general economy condition requiring that the lexical items present in the PF output match the ones present in the underlying numeration. That is, insertion of (semantically vacuous) material in the morphological component is only allowed if needed for convergence. When no specific convergence requirement is at issue, as is the case of (7e)/(6), for instance, this faithfulness condition blocks insertion of *to*.²

This reasoning extends to cases such as (11) and (12) in English and (13) in Serbo-Croatian, also discussed by HMN under this perspective.

¹ This reasoning also provides an account for the ungrammaticality of (i) below, pointed out by Hans Broekhuis (p.c.). Given that inherent Case is associated with specific θ -roles, the ungrammaticality of (i) follows if the θ -role assigned by the verb *see* to an infinitival clause is different from the θ -role assigned to a DP. In other words, if *to* realizes the inherent Case assigned to the infinitival clause, as assumed here, it cannot be associated with a DP, as in (i).

(i) * It was seen to Mary

² The existence of multiple copy constructions (in violation of this general faithfulness condition) may be compatible with the view advocated by HMN if the realization of multiple copies is triggered by convergence requirements of the morphological component, as proposed by Nunes (1999, 2004) (see also the collection of papers in Corver and Nunes 2007 for relevant discussion).

- (11) a. * John **does** love Mary [unstressed *do*]
 b. John loves Mary
- (12) a. * [[the city]_i's [destruction **of** *t_i*]]
 b. [[the city]_i's [destruction *t_i*]]
- (13) a. On je ovladao (***sa**) zemljom
 he is conquered with country-INSTR.SG
 ‘He conquered that country.’
- b. On je ovladao ***(sa)** pet zemalja
 he is conquered with five country-GEN.PL
 ‘He conquered five countries.’

Given that the derivations underlying (11a) can converge without *do*-support (cf. (11b)), (11a) is filtered out by the faithfulness condition under the assumption that dummy *do* is not part of the numeration (see Arnold 1995). Similar considerations apply to (12): *the city* is Case-licensed in both (12a) and (12b), but only (12b) satisfies the faithfulness condition; hence, (12a) is ruled out. As for (13), Bošković (2006) shows that when instrument Case morphology can be realized by an NP in Serbo-Croatian, insertion of the preposition *sa* ‘with’ is prevented (cf. (13a)). By contrast, given that “higher numerals” like *pet* ‘five’ in Serbo-Croatian do not decline, the realization of inherent instrumental Case in (13b) is only possible if the preposition is inserted (see Bošković 2006 for additional data and discussion). The contrast in (13) thus indicates that *sa* in these constructions is not present in the numeration and its realization in violation of the faithfulness condition yields a grammatical output only when convergence requirements on Case realization in the morphological component demand it.

To sum up, in this section we discussed instances of P-insertion in the mapping from Spell-Out to PF and showed that they can be analyzed as following from the interaction between convergence requirements and a general

economy condition demanding that the lexical items present at PF match the ones present in the numeration that feeds the derivation. In the next section, we discuss cases where this interaction results in apparent P-deletion, instead.

3 Apparent P-deletion

Consider the BP data in (14)–(17) below.

- (14) a. O João gosta ***(d)a** Maria
 the João likes of-the Maria
 ‘João likes Maria’
- b. * O João riu ***(d)a** Maria
 the João laughed of-the Maria
 ‘João laughed Maria’
- (15) a. * Quem que o João gosta **de**?
 quem that the João like of
 ‘Who does João like?’
- b. * Quem que o João riu **de**?
 quem that the João laughed of
 ‘Who did João laugh at?’
- (16) a. **(De)** quem que o João gosta?
 of who that the João likes
 ‘Who does João like?’
- b. O João gosta ***(de)** quem?
 the João likes of who
 ‘Who does João like?’
- (17) a. ***(De)** quem que o João riu?
 of who that the João laughed
 ‘Who did João laugh at?’
- b. O João riu ***(de)** quem?
 the João laughed of who
 ‘Who did João laugh at?’

(14) shows that the verbs *gostar* ‘like’ and *rir* ‘laugh’ in BP subcategorize for a PP headed by the preposition *de* ‘of’. (15) further shows that BP does not generally allow P-stranding (see Salles 1997). Interestingly, (16) shows that the preposition may be dropped if the *wh*-phrase appears in the left periphery (see Kato 2008). However, this cannot be a general process, for in (17) the preposition must be present regardless of the position of the *wh*-constituent.³

Discussing data parallel to (14)–(17) in the domain of relative clauses and left dislocation structures in BP, Kato and Nunes (forthcoming) argue that it is not the case that the preposition in (16a) is optional or can be deleted. Rather, each possibility is taken to correspond to a different derivational path: the version with the preposition involves movement and the version without the preposition involves base generation of the *wh*-phrase and resumption, as illustrated in (18) below. These two possibilities correlate, as we should expect, with island effects, with only the version with the preposition displaying island sensitivity, as shown in (19).

³ Contrasts such as the one in (14)–(17) are not restricted to the preposition *de* ‘of’ in BP, as illustrated in (i)–(ii), with the preposition *com* ‘with’ (see Kato and Nunes forthcoming for relevant discussion).

- (i) a. O João conversou ***(com)** a Maria ontem
 the João talked with the Maria yesterday
 ‘João talked with Maria yesterday.’
 b. O João competiu ***(com)** a Maria ontem
 the João competed with the Maria yesterday
 ‘João competed with Maria yesterday.’
- (ii) a. **(Com)** quem que o João conversou ontem?
 with who that the João talked yesterday
 ‘Who did João talk to yesterday?’
 b. ***(Com)** quem que o João competiu ontem?
 with who that the João competed yesterday
 ‘Who did João compete with yesterday?’

- (18) a. [[de quem]_i que o João gosta *t_i*]?
 of who that the João likes
 ‘Who does João like?’
- b. [quem_i que o João gosta *pro_i*]?
 who that the João likes
 ‘Who does João like?’
- (19) a. * [[de que autor]_i que você não encontrou uma só pessoa [que
 of which author that you not found one only person that
 gostasse *t_i*]]?
 liked
 ‘Which author was such that you didn’t find a single person who
 liked him?’
- b. [[que autor]_i que você não encontrou uma só pessoa [que
 which author that you not found one only person that
 gostasse *pro_i*]]?
 liked
 ‘Which author was such that you didn’t find a single person who
 liked him?’

What about the contrast between (16a) and (17a)? What is responsible for blocking the P-less versions of (17a) under a derivation employing base-generation and resumption, as in (18b) and (19b)? Kato and Nunes’s (forthcoming) account for this contrast involves two ingredients. First, assuming that it is a lexical idiosyncrasy that some verbs but not others assign inherent Case, they propose that prepositions that can be omitted in BP are markers of inherent Case. This means that *gostar* ‘to like’ in (14a)/(16) assigns inherent Case, but *rir* ‘to laugh’ in (14b)/(17) does not. Independent evidence for their proposal is the fact that *gostar* licenses an inherently Case marked reflexive clitic, but *rir* does not, as shown in (20).

- (20) a. Eles **se** gostam muito
 they REFL.CL.3PL like much
 ‘They like each other a lot.’

- b. * Eles **se** riram bastante
 they REFL.CL.3PL laughed much
 ‘They laughed a lot at each other.’

The second ingredient of their analysis relies on the general availability of null pronominal objects in BP (see among others Galves 1989, Farrell 1990, Kato 1993, Cyrino 1997, and Ferreira 2000). Kato and Nunes (forthcoming) propose that a null pronoun can be licensed by an inherent Case assigning verb such as *gostar* (cf. (18b) and (19b)). Thus, the unacceptability of the P-less version of (17a) under a derivation involving base-generation and resumption, sketched in (21) below, is due to the lack of structural or inherent Case-licensing for *pro*. Crucially, although *pro* can be licensed by inherent Case, *rir* is not an inherent Case assigner (cf. (20b)).

- (21) * [quem_i que o João riu *pro*_i]?
 who that the João laughed
 ‘Who did João laugh at?’

Questions then arise with respect to the unacceptability of (15a) and (15b), under the derivation involving base-generation and resumption, as sketched in (22).

- (22) * [quem_i que o João gosta **de** *pro*_i]?
 who that the João likes of
 ‘Who does João like?’

There are two potential explanations for the ungrammaticality of (22): (i) *pro* is like traces (cf. (15)) in also being incompatible with a stranded preposition; or (ii) the realization of inherent Case in the phonological component is subject to the interaction between convergence and faithfulness considerations, as discussed in section 2. Data such as (23) allow us to tease these two possibilities apart.

- (23) a. O professor distribuiu [o material]_i, mas eu fiquei **sem** *pro*_i
 the teacher distributed the material but I remained without
 ‘The teacher handed out the material, but I didn’t get it.’
- b. Que cópia que [os alunos que ficaram **sem** *pro*_i]
 which copy that the students that remained without
 reclamaram?
 complained
 ‘Which copy was it that the students who didn’t get it complained?’

(23a) shows that the proposition *sem* ‘without’ in BP is exceptional in allowing a null complement. In turn, (23b) further shows that this null complement may appear within islands (in this case a relative clause within a subject), which indicates that we are dealing with *pro* rather than a trace. Thus, the acceptability of the sentences in (23) shows that the ungrammaticality of (22) does not have to do with stranding, but with Case realization.

To wrap up. The contrast between (16a) and (17a) also follows from the interaction between convergence requirements and the faithfulness condition matching the lexical items present in the PF output and the underlying numeration. That is, assuming that the Case Filter ultimately requires that overt nominal expressions realize Case, the faithfulness condition will always be violated in constructions such as (16b), for a preposition that is not present in the numeration must be inserted to realize the inherent Case assigned by the verb. However, if the argument of the verb is null, the faithfulness condition becomes relevant and insertion of the preposition is blocked (cf. (22)). Constructions such as (21), on the other hand, have no salvation, for the particular verb chosen does not assign inherent Case and the derivation crashes because *pro* is not Case-licensed.

4 P-duplication

Let us finally consider syntax-phonology mismatches involving P-duplication.

Take the BP data in (24) and (25), for instance.

- (24) a. * Eu pensei **em o** João *[formal/colloquial BP]*
 I thought in the João
 ‘I thought about João.’
- b. Eu pensei **no** João *[formal/colloquial BP]*
 I thought in-the João
 ‘I thought about João.’
- (25) a. Eu pensei **em o** João fazer esse trabalho *[formal BP]*
 I thought in the João do-INF this job
 ‘I think that João should do this job.’
- b. Eu pensei **no** João fazer esse trabalho *[colloquial BP]*
 I thought in-the João do-INF this job
 ‘I think that João should do this job.’

(24) shows that in BP the preposition *em* ‘in’ and the definite article *o* ‘the’ must contract when they are adjacent. In turn, (25) shows that if the definite article belongs to the embedded subject, lack of contraction is possible in formal registers of BP, although contraction is the form chosen in colloquial BP. Nunes and Ximenes (forthcoming) analyze the difference between (25a) and (25b) as arising from two different structures. In formal registers of BP, the Case-marking preposition *em* precedes the whole infinitival CP, as shown in (26) below, and in this circumstance it is not adjacent to the determiner due to the intervention of C; lack of adjacency then yields lack of contraction (cf. (25a)). As for colloquial BP, Nunes and Ximenes argue that the preposition is realized as C, which renders it adjacent to the determiner, as sketched in (27), and contraction is obligatory (cf. (25b)).

- (26) [... X [**P** [_{infinitival-CP} C [TP [DP **D** ...]]]]]

(27) [... X [_{infinitival-CP} P/C [_{TP} [_{DP} D ...]]]]

A very puzzling paradigm arises in colloquial BP when the contraction patterns depicted in (24)–(25) are combined with coordination, as illustrated in (28) and (29) (see Ximenes 2002, 2004, Ximenes and Nunes 2004, and Nunes and Ximenes forthcoming).

(28) a. * Eu pensei **no** João e **a** Maria [*formal/colloquial BP*]
 I thought in-the João and the Maria
 ‘I thought about João and Maria.’

b. Eu pensei **no** João e **na** Maria [*formal/colloquial BP*]
 I thought in-the João and in-the Maria
 ‘I thought about João.’

(29) a. * Eu pensei **em o** João e **em a** Maria [*formal/colloquial BP*]
 I thought in the João and in the Maria
 fazerem esse trabalho
 do-INF.3PL this job
 ‘I think that João and Maria should do this job.’

b. Eu pensei **no** João e **na** Maria [*colloquial BP*]
 I thought in-the João and **in-the** Maria
 fazerem esse trabalho
 do-INF.3PL this job
 ‘I think that João and Maria should do this job.’

(28) shows that contracting prepositions must be repeated if one of the conjuncts has a determiner that triggers contraction. This suggests that the Parallelism Requirement on coordinated structures (see e.g. Chomsky 1995, Fox 2000) also applies to the morphological component. That is, once contraction appears in one conjunct, it must appear in every conjunct. Thus, at first sight, (28) can converge only if there are two prepositions in the underlying numeration and the PPs headed by these preposition are accordingly coordinated, as sketched in (30).

- (30) [Eupensei [[_{PP} **no** João] e [_{PP} **na** Maria]]]
 I thought in-the João and in-the Maria

However, this account cannot be extended to (29). That the presence of the uncontracted preposition in (29a) leads to ungrammaticality is not mysterious, for the embedded subject must involve coordination of DPs and not of PPs. For instance, the coordinated subject functions as the agent of the embedded verb and triggers plural agreement on the inflected infinitival. If PP coordination is not a convergent option for (29a), the question then is why the sentence becomes acceptable if the prepositions get contracted with the relevant determiners (cf. (29b)).

Nunes and Ximenes forthcoming (see also Ximenes 2002, 2004 and Ximenes and Nunes 2004 for discussion) argue that (29b) indeed involves coordination of DPs, as expected, and that the second preposition is inserted in the morphological component. More specifically, they propose that if we have morphological merger (see Halle and Marantz 1993) in the boundary of one conjunct, the Parallelism Requirement requires morphological merger in all conjuncts. The derivation of (29b), for instance, proceeds along the lines of (31).

- (31)a. *Spell-Out*:
 [... pensei [_{CP} **em** [_{TP} [_{andP} [_{DP} **o** João] [_{and'} e [_{DP} **a** Maria]]] fazerem...]]]
- b. *Morphological merger*:
 [... pensei [_{CP} [_{TP} [_{andP} [_{DP} **em+o** João] [_{and'} e [_{DP} **a** Maria]]] fazerem...]]]
- c. *Copy and morphological merger*:
 [... pensei [_{CP} [_{TP} [_{andP} [_{DP} **emⁱ+o** João] [_{and'} e [_{DP} **emⁱ+a** Maria]]] fazerem...]]]
- d. *Fusion*:
 [... pensei [_{CP} [_{TP} [_{andP} [_{DP} **no** João] [_{and'} e [_{DP} **na** Maria]]] fazerem...]]]

Given that in colloquial BP, Case-marking prepositions are realized in C when they take infinitival complements (cf. (27)), the preposition *em* in (31a) is adjacent to the first determiner of the coordinated embedded subject in the spelled out structure and morphological merger is obligatory in these circumstances, as seen in (31b). Once morphological merger affects the boundary of the coordinated subject, the Parallelism Requirement on coordinated structures kicks in and demands that the second conjunct also undergo morphological merger. Given that there is no preposition adjacent to the determiner of the second conjunct (recall that the embedded subject involves DP- and not PP-coordination), the preposition morphologically merged with the first conjunct is then copied and the resulting copy merges with the determiner of the second conjunct, as shown in (31c).⁴ Finally, the prepositions and the determiners fuse, as shown in (31d), yielding the PF output in (29b), which at first glance appears to involve a quite exotic case of PP-coordination.⁵

⁴ Such copying can be seen as a subtype of the standard operation involved in morphological reduplication.

⁵ This means that the sentence in (28b) may result from a derivation with two instances of the preposition *em* in the numeration and PP coordination in the syntactic component (cf. (30)) or from a derivation with a single instance of *em*, DP-coordination in the syntactic component, and P-duplication in the morphological component. See Ximenes 2002, 2004, Ximenes and Nunes 2004, and Nunes and Ximenes forthcoming for discussion.

For the sake of completeness, it is worth noting that although the contrast in (28) also holds in formal BP, the scenario that triggers P-duplication in constructions such as (29b) never arises in the formal register. Given that P is generated outside CP, the adjacency requirement on morphological merger between P and the determiner of the embedded subject is not met due to the intervention of C (cf. (26)). Once morphological merger does not apply in the first conjunct, the Parallelism Requirement is vacuously satisfied and the structure surfaces with no contraction, as illustrated in (32).⁶

- (32) Eu pensei **em o** João e **a** Maria [*formal BP*]
 I thought in the João and **the** Maria
 fazerem esse trabalho
 do-INF.3PL this job
 ‘I think that João and Maria should do this job.’

Although less transparent than the cases discussed in the previous sections, preposition duplication in BP infinitival constructions can also be analyzed in terms of the interaction between a convergence condition – in this case the Parallelism Requirement applying to morphological structures – and the general economy condition regulating the insertion of material not present in the numeration.

⁶ Hans Broekhuis (p.c.) asks whether the contrast between the formal and colloquial registers of BP can be accounted for in OT terms if the constraints FUSION and FAITHFULNESS are ranked differently in each register, with FUSION being ranked higher than FAITHFULNESS in colloquial BP, but lower than FAITHFULNESS in formal BP. Although this suggestion would correctly account for the contrast between (29b) and (32), it would fail to account for the unacceptability of (i) in formal BP. Under a derivation with just one preposition in the derivation (see fn. 5), (i) should be the best candidate as the number of prepositions in the numeration and the final output is kept constant, in compliance with FAITHFULNESS.

- (i) * Eu pensei **em o** João e **a** Maria. [*formal/colloquial BP*]
 I thought in the João and the Maria
 ‘I thought about João and Maria.’

5 Concluding Remarks

This paper examined the realization of dummy prepositions in the phonological component, reviewing three cases of mismatch between what is generated by the syntactic component and what surfaces in the PF output. In all of them, a spurious preposition cannot be analyzed as part of the numeration that underlies the derivation, as this should lead to overgeneration. The solution of freely inserting such prepositions in the phonological component also leads to problems of overgeneration. The solution common to all cases is to assume that there is a general economy condition that enforces faithfulness between the lexical items that are present in the numeration that feeds the derivation and the lexical items of the PF output. All things being equal (i.e. when no convergence requirement is at stake), this faithfulness condition filters out insertion of lexical material not present in the numeration and blocks overgeneration. When convergence requirements of the morphological component having to do with Case or the Parallelism Requirement are at play, faithfulness will then be violated, yielding a mismatch between the structures generated by the syntactic component and their PF outputs.

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Branching constraints*

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Rejecting approaches with a directionality parameter, mainstream minimalism has adopted the notion of strict (or unidirectional) branching. Within optimality theory however, constraints have recently been proposed that presuppose that the branching direction scheme is language specific. I show that a syntactic analysis of Chechen word order and relative clauses using strict branching and movement triggered by feature checking seems very unlikely, whereas a directionality approach works well. I argue in favor of a mixed directionality approach for Chechen, where the branching direction scheme depends on the phrase type. This observation leads to the introduction of context variants of existing markedness constraints, in order to describe the branching processes in terms of optimality theory. The paper discusses how and where the optimality theory selection of the branching directions can be implemented within a minimalist derivation.

Keywords: minimalist program, optimality theory, focus, branching, extraposition, Chechen

1 Introduction

One of the fundamental operations adopted in the Minimalist Program is the *merge* operation, which combines syntactic elements from the numeration as well as previously produced structures in order to form a hierarchical structure (Chomsky 1995). The merge operation has generally not been regarded as being directional in nature.¹ One widely accepted conversion from the two-dimensional hierarchy into a one-dimensional output fed into the phonology

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¹ There has been a proposal to make the merge operation directional, but I have not seen other researchers taking on that lead (Saitu and Fukui 1998).

interface builds upon the linear correspondence axiom, which says that asymmetric c-command implies precedence (Kayne 1994).² This implies that all languages adhere to one specific branching scheme, i.e. that they have the same underlying order. Differences in word orders between languages and within any particular language must, by this concept, be due to a different hierarchical syntactic structure. Differences in structure are arrived at by movement of syntactical objects. The trigger for movement is feature checking.

The idea of directionality, which in Government and Binding theory was implemented with a directionality parameter, has within Optimality Theory been implemented using universal violable constraints that determine the relative positions of specifier, head and complement for a language (Grimshaw 1993, 1997, 2001, 2002, 2006, Zepter 2003). The hierarchical ranking of such constraints is what determines the general word order differences between languages. Within languages directionality can differ between functional and lexical projections, which, for optimality theory, is explained by introducing more constraints (Zepter 2003).³

² Persuasive arguments have been provided against the LCA (e.g. Abels and Neeleman 2007). However, the mapping to the output is not as simple as stated here. A major problem is the question how two lexical sister items dominated by one syntactic node should be linearized.

(i) a. *kygalxuochuo* *Muusa* *vyyr* *vu*
 leader-ERG Musa v-kill-FUT V-PRS
 ‘the leader will kill Musa’.

b. $[_{IP} \textit{kygalxuochuo}_i [_{I'} [_{VP} t_i [_{V'} \textit{Muusa vyyr}]]] \textit{vu}]]$

For example sentence (ia) is analyzed as the structure (ib), whereby *Muusa* and *vyyr* are two lexical nodes c-commanding one another. One solution might be to postulate an empty D head for the object *Muusa*, but this seems unlikely, since DP’s have not been attested for Chechen. A few other solutions have been offered for the problem in general, but, as far as I know, none take the head-complement difference into account (Hornstein 2005:228-232).

³ Outside of Optimality Theory others have also suggested making differentiations between the branching direction within functional and lexical projections (Haider 1997, Broekhuis 2006).

In section 2 of this paper I show data from the Northeast Caucasian Chechen language, which, when attempting to describe the syntax of that data, make a strict branching approach less attractive than one where the branching direction of specifiers and heads can vary. I show that Chechen as a whole favors left branching specifiers and right branching heads, except for focus phrases – there left branching heads are favored. How a directionality approach could be implemented is the topic of section 3, where it is shown how an optimality theory selection scheme that determines the branching direction can be combined with a minimalist derivation. A ranking scheme is proposed for Chechen and verified against the data. The paper concludes in section 4 by summarizing the results and drawing some conclusions.

2 Chechen branching

In this chapter I show why strict branching is less capable of describing the Chechen data than a directionality approach, leaving the question how such an approach might be implemented for the next chapter. In section 2.1 I show that the auxiliary can be regarded as an overt realization of the head of the inflectional phrase. Under that assumption a strict branching approach gives the wrong results for the unmarked word order with compound verb tenses, as shown in section 2.2. In that same section I provide an alternative: assume left branching specifiers and right branching heads. The necessity to switch from strict branching to a directionality approach is confirmed by attempts to describe the syntax of relative clauses in section 2.3.

The directionality approach advocated shows that at least VP, vP, IP and CP need to have a right branching head instead of a left branching one. But further data shows that not all projections need to have the head branch in the same direction. So Chechen is analyzed as not having a uniform directionality

scheme, but a mixed one. Specifically in section 2.4 I show that Focus phrases can best be described as having a left branching head. This is confirmed by the syntax of extraposed relative and possessive clauses in section 2.5.

2.1 The auxiliary as an IP head

This subsection briefly explains why the auxiliary can be regarded as an overt realization of the head of the IP, the inflectional phrase (see also Komen 2007a). The Chechen auxiliary marks agreement and tense, but lacks an overt verb root component. This is reason enough to regard the auxiliary as overt realization of the inflectional phrase's head. Auxiliaries are built up by a class-marking prefix *v-*, *j-*, *b-* or *d-*, followed by a tense marker. This tense marker is *u* for the present and *-ra* for the past. Negated forms of the present auxiliary like *daac* lack a tense marker, but have a negating suffix *-ac*. Negated forms of the past auxiliary have both tense as well as negation.

The auxiliary occurs in sentences with a compound tense (present continuous, past continuous, etc.). Such tenses consist of a verb in a particular form followed by the auxiliary, as in (1). In compound tenses the verb can be expressed as a past participle (with adverbial meaning), a present participle (also with adverbial meaning) or a future form. Simple tenses don't use a form of the auxiliary, as illustrated in (2).

- (1) Muusa dika buolx biesh vu.
 Musa-OBL good work-ABS B-do-PTC V-PRS⁴
 'Musa is doing a good work.'

⁴ The following abbreviations are used: ABS=absolute, DAT=dative, ERG=ergative, GEN=genitive, IMPF=imperfective, NML=nominalizer, OBL=oblique (non-absolute case), PL=plural, PRS=present, PSTN=past using *-ina*, PSTR=past using *-ira*, PTC=present participle, REL=relativizer.

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- (2) SielxanaMuusas buolx bira.
 yesterday Musa-ERG work-ABS B-do-PSTR
 ‘Musa worked yesterday.’

2.2 The unmarked word orders

Let us now take a closer look at the syntactic description of the unmarked word order in Chechen, assuming the following:

- The theoretical framework is minimalism (Chomsky 1995).
- The auxiliary is an overt realization of the IP head (see 2.1).
- Applying the linear correspondence axiom gives the correct spell-out order (Kayne 1994).
- Chain reduction applies: only the highest items in a chain are spelled out.

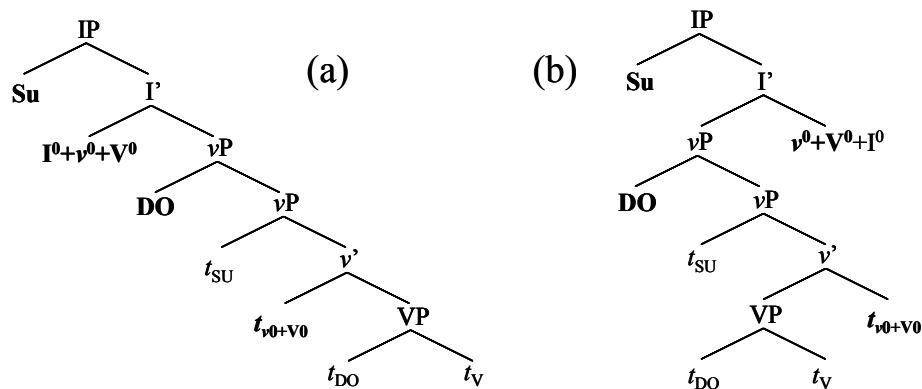
The unmarked word order for clauses with a transitive verb is SOV (Komen 2007a, 2007c). An example of such a clause is given in (3).

- (3) C’aruo ysh baaguosh bu.
 fire-ERG 3P-ABS B-burn-PTC B-PRS
 ‘The fire is burning them.’

The syntactic derivation of this word order, assuming strict branching, is illustrated in Figure 1a. The main verb and the direct object are taken from the numeration and the operation merge forms them into the lower VP. Then the light verb is taken from the numeration, merging with the lower VP. Next the subject is taken from the numeration, and it merges with the existing structure, becoming the first specifier of vP . Since the light verb can check object case, a copy is made of the direct object and it merges with the syntactic structure so far to become a second specifier of the vP and check case from there. Next the auxiliary, being the overt realization of the IP head, is taken from the numeration to merge with the structure. The IP head can check the subject case feature, so a copy of the subject is made and merged as the specifier of the IP. Next, either in overt or in covert syntax, the combined head v^0+V^0 adjoins to the

IP head to check tense (in Chechen tense is present both on the auxiliary as well as on the verb). At spell-out the linear correspondence axiom is applied, so that the order of words fed into the phonological component is strictly determined by the asymmetric c-command relationships.⁵

Figure 1 Unmarked SOV order



Now the problem with the unmarked word order becomes apparent: the word order arrived at with the strict branching approach is S-Aux-V-O, whereas the language data has shown that the unmarked word order is S-O-V-Aux.⁶ If one insists on strict branching (which implies that copying (gebruik gewoon: movement) can only occur leftward), the only way to derive the correct word order would be by the following two operations: (a) copy the remnant vP (consisting of O) to the specifier of an XP above the subject S, (b) head movement of $I^0+v^0+V^0$ to adjoin to the head of this XP, and (c) copy the remnant IP (consisting of subject S) to a clause initial position—the specifier of a projection above XP. But movement is only supposed to take place under the pressure of feature checking and there are no features to be checked by this movement.

⁵ In other terms: walk the tree from left to right.

⁶ Instead of S-Aux-V-O the word order alternatively is S-Aux-O-V, depending on whether the verb adjoins to the head of IP in overt or covert syntax.

The alternative to strict branching in the description of the Chechen data is to allow for heads to branch right while specifiers branch left, as illustrated in Figure 1b.⁷ Except for the branching directionality the derivation of the unmarked word order runs along the lines as given above.

If the selection of the branching direction takes place at the level of the basic minimalist operation merge, then it merge needs to “know” whether a head or a specifier is merged. But merge needs to be aware what it is merging anyway, since only heads project, only heads provide room for one or more specifiers and for complements (Hornstein et al. 2005:202).

The word order of the unmarked clause now correctly becomes S-O-V-Aux, if at spell-out the syntactical tree is walked from left to right.

2.3 Relative clauses

Let us take a look at the syntactic description of Chechen relative clauses, and see what this tells us about branching. Besides the minimalist assumptions introduced in section 2.2, I will adopt the adjunct analysis of relative clauses, which is a unification of the matching and the raising analysis (Henderson 2007). Furthermore I assume that the suffix *-l* is a complementizer (specifically a relativizer), and that forms like *dolu* ‘that is/are’ should be regarded as a combination of the auxiliary *du* (the overt realization of the inflectional head) and this complementizing affix; cf. Komen 2007b for more discussion.

I will show that, given these assumptions, the strict branching analysis runs into problems. This is illustrated in section 2.3.1. The only analysis which seems to reflect reality is one where heads branch to the right and specifiers to the left. This is illustrated in section 2.3.2.

⁷ If an element *x* “branches right” then it is positioned at the right branch of its parent.

2.3.1 Analysis with strict branching

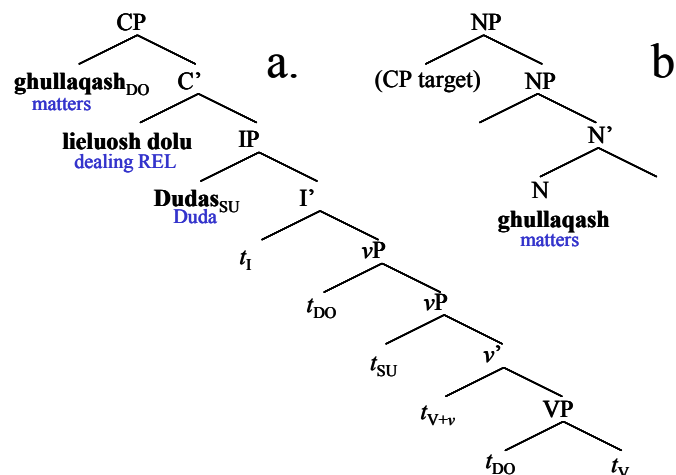
Adopting for the sake of the argument strict branching again, the analysis of the unmarked SOV clause runs along the lines given by Komen (2007a). The clause is built up as shown and described in section 2.2.

Let me illustrate the derivation of the relative clause using part of (4).

- (4) [Dudas t_i lieluosh **dolu**] ghullaqash_i
 DUDA-ERG deal-PRS-PTC D-REL matter-PL-ABS
 ‘the things Duda was dealing with.’ (Baduev 1991:25)

As shown in Figure 2, the relativizer projects a CP, and the direct object is copied to its specifier attracted by a relativizing feature. The relativizer has joined up with the head of IP (which is overtly realized as an auxiliary) to form a compound head *dolu*.⁸ According to the adjunct analysis of relative clauses a copy of the NP *ghullaqash* is made, which then is used as a separate syntactic object for building the matrix clause (Henderson 2007).⁹ The relative clause CP adjoins to this copy of the NP, as shown in Figure 2b).

Figure 2 Formation of relative clause using strict branching



⁸ The fact that the IP head has formed a phonological compound with the relativizer, the head of the CP, shows that head movement has taken place from I⁰ to C⁰.

⁹ According to Henderson adjunction takes place to the NP, but within the DP. For Chechen no DP has been established so far.

With this analysis the whole relative clause would, at the point of spell-out, be as shown in (5), which is not in line with the observed form in (4).

(5) * $[_{NP} [_{CP} t_i \text{ lieluosh } \mathbf{dolu} \text{ Dudas}] \text{ ghullaqash}_i]$

One might be tempted to argue that the compound IP head *lieluosh du* does not move to adjoin to the head of CP until after spell-out. But that conflicts with the observed phonological compound $I^0+C^0 \text{ dolu}$, and so would be in conflict with the phasing theory, which predicts the whole CP to be formed correctly before spell-out.

Another point that might be raised is that the participle *lieluosh* ‘dealing’ has moved upwards too far – it should not have left the ν P. This would be valid point if the participle is tenseless, but it is not: it carries a present tense morpheme.’ The participle can be marked for as many as three different tenses: *lieluosh* ‘dealing-PRS’, *lieliina* ‘dealing-PST’, and *lieluor* ‘dealing-FUT’. Since it contains a tense feature to be checked, it must move to the head of an IP and adjoin to it. That this argument holds is confirmed by the fact that no material may intervene (as far as I have been able to ascertain) between a participial form and the relativizing form of the auxiliary.

2.3.2 Analysis with directionality

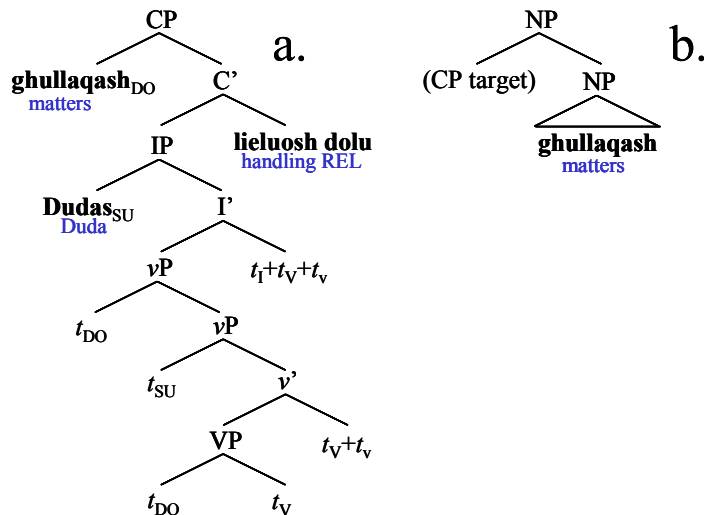
Consider an approach which is based on the following assumptions :

- Heads of the VP, ν P, IP and CP branch right, and specifiers branch left.
- Spell-out order is arrived by walking the tree from left to right.
- Chain reduction applies: only the highest items in a chain are spelled out.

The derivation of the relative clause given in (4) runs as follows (see Figure 3). A relativizing head C^0 is taken from the numeration and projects a CP. The head has a strong feature, attracting the direct object being relativized into its specifier. The compound head $V^0+\nu^0+I^0$ moves up and combines with the head

of CP. This yields the object shown in Figure 3a). Then a separate copy of the NP *ghullaqash* ‘matters’ is made for the matrix clause as in Figure 3b, and the relative clause CP adjoins to its left.

Figure 3 Formation of relative clause using the directionality approach



At spell-out chain reduction is applied, resulting in the correct surface order.

Assuming a left branching specifier and a right branching head, then, give realistic and straightforward results while retaining other “standard” minimalist assumptions (features, copying etc).

In the next two sections I show that the branching directionality may be different, depending on the kind of phrase being projected.

2.4 Focus and Topic phrases

As was noted in section 2.2, the unmarked word order of a Chechen clause is SOV. When the direct object is focused, word orders SO_FV and O_FVS are observed. When the subject is focused, word orders S_FVO and OS_FV are observed (Komen 2007a). The syntactic analysis of focus in Chechen assumes that there is a phonologically empty head Foc^0 of a focus phrase $FocP$, that there is a language specific requirement that this head be overtly filled, and that for Chechen the verb is the prime candidate for filling this head.

If Chechen heads *uniformly* are assumed to occupy the right branch of their parents, the heads of vP , VP and IP, possibly combining into a compound, will then always be found at the right edge of any IP. Focus phrases would build on top of such an IP, and the head of the focus phrase would appear at the rightmost edge of a clause containing a focused constituent. But this runs foul of the data observed. Whenever the object is focused, the combination of O_FV seems to form one entity. This entity, which I assume to be a constituent, could be labeled as the focus phrase.¹⁰ This focus phrase does not appear at the right edge of the clause, however, witness the occurrence of the O_FVS word order in Chechen.

The same is true for focused subjects, which result in a combination S_FV . But this combination, the focus phrase, cannot be broken up and does not necessarily occur clause finally, as for instance in the S_FVO word order.

Therefore I suggest that at least focus and possibly topic phrases have a left branching head in Chechen.¹¹ This provides a straightforward account for all the data.

2.5 Extraposed clauses

Assuming that CP, IP, vP and VP have right branching heads turns out to be crucial for an effective description of relative clauses in Chechen. Focus phrases and their branching are also relevant to the discussion of extraposed relative

¹⁰ The idea that there are separate functional projections called "focus phrase" and "topic phrase" is not accepted by everyone (Szendrői 2001, Neeleman and van der Koot 2007). But for Chechen no alternative descriptions have yet been posited.

¹¹ The reason for my hesitation about topic phrases stems from the fact that the head of the topic phrase is, as far as I have been able to determine, phonologically empty, and does not need to have an overt head to adjoin to it (whereas the focus phrase does). Therefore it is impossible to know for sure where the head of the topic phrase branches to – left or right. But for the moment I am assuming it branches left, like the focus phrase does.

clauses¹² as we will see in section 2.5.1, and extraposed possessive clauses, as we will see in section 2.5.2.

2.5.1 Extraposed relative clauses

Under the adjunct analysis, relative clauses are regarded as adjuncts, which is why I assume them to be base-generated in the position in which they occur. So when such a relative clause appears to be extraposed (and occurs in sentence-final position), then it must have been “left behind” while the noun phrase to which it belongs was copied leftward, for instance due to attraction by a focus or topic feature.

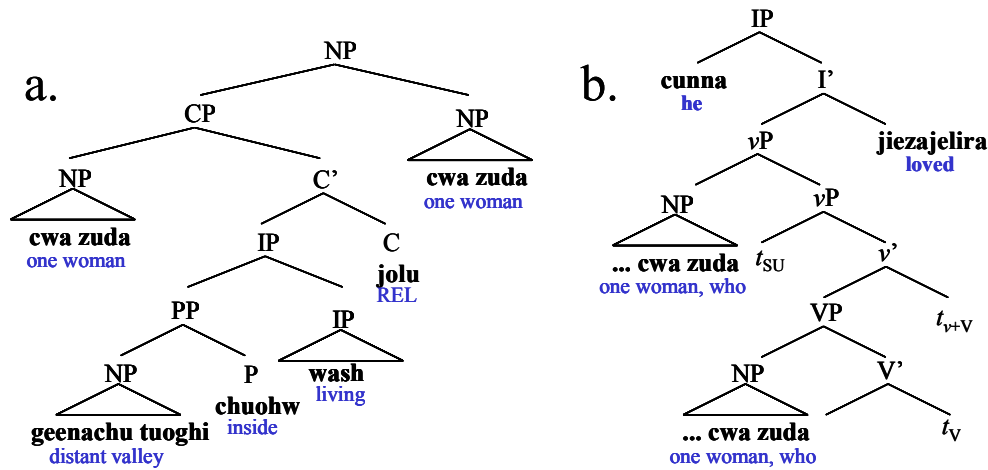
Let me illustrate this process using the relative clause given in (6).

- (6) Cunna cwa zuda jiezajelira, [geenachu tuoghi chuohw wash jolu]
 3S-DAT one woman-ABS J-love-PSTR distant-OBL valley-DAT inside live-PTC J-REL
 ‘He fell in love with a woman that lived in a distant valley.’

The syntax of the relative clause *geenachu tuoghi chuohw wash jolu* ‘that was living in a distant valley’ can be described as shown in Figure 4a). The CP is adjoined above the NP proper. The matrix clause would look as in Figure 4b). There are two copies of the object NP, and the relative clause CP may either adjoin to the copy in the specifier of VP, or to the copy in the upper specifier of vP —but *not* to both. This construction would not result in the relative clause being extraposed, however, since the last constituent of the IP continues to be the verb (i.e.: I⁰+v⁰+V⁰).

¹² Extraposed possessive clauses work the same way.

Figure 4 Extraposition of relative clause

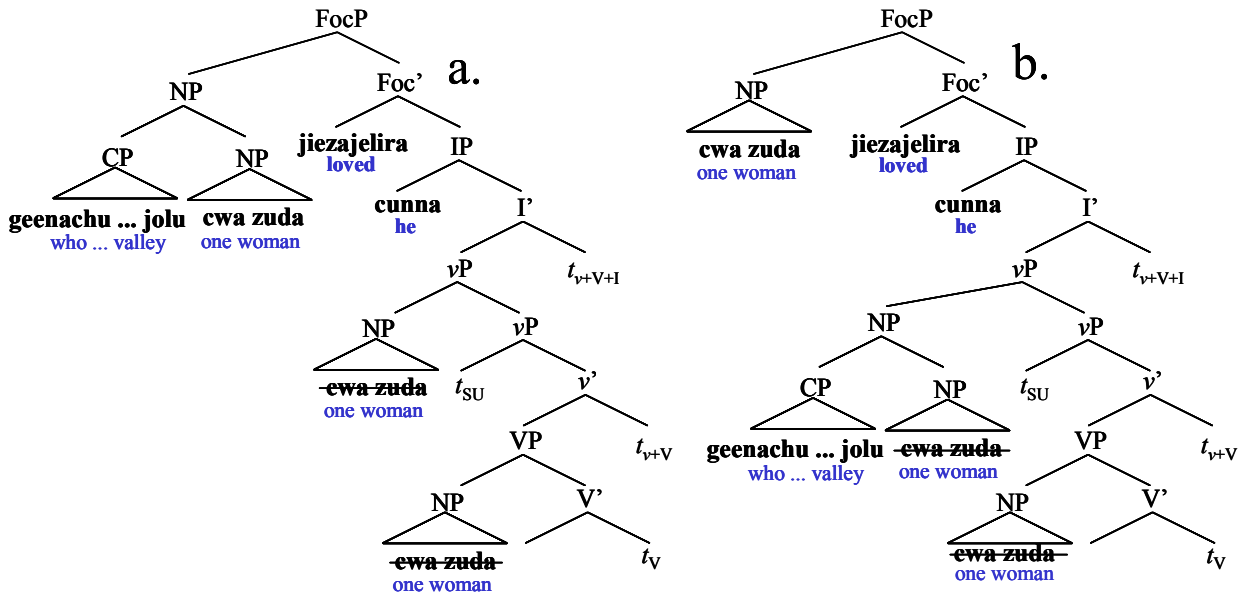


The idea of partial deletion giving two plausible configurations will only work if the object NP proper, i.e. the part without the relative clause, is moved out of the IP further upwards—for instance into a focus phrase. Let me illustrate this with the OVS variants of (6), which are shown here in (7) and (8).

- (7) Cwa zuda jiezajelira cunna, [geenachu tuoghi chuohw wash jolu]
 one woman-ABS J-love-RFPS 3S-DAT distant-OBL valley-DAT inside live-PTC J-REL
 ‘He fell in love with a woman that lived in a distant valley.’
- (8) [Geenachu tuoghi chuohw wash jolu]cwa zuda jiezajelira cunna.
 distant-OBL valley-DAT inside live-PTC J-REL one woman-ABS J-love-RFPS 3S-DAT
 ‘He fell in love with a woman that lived in a distant valley.’

Figure 5 shows that the relative clause part of a noun phrase can occur in two positions. If adjoined to the focus phrase (je bedoelt: the phrase in focus?), as in Figure 5a), there is no extraposition, resulting in the word order of example (8). But notice that the correct word order only follows if it is accepted that the head of the focus phrase branches *left* and not right. If adjoined to the copy of the noun phrase that resides in the vP, as in Figure 5b), the relative clause is extraposed, and the word order of example (7) follows. Again, the correct word order crucially depends on the left-branching head of the focus phrase.

Figure 5 Extraposition and focus



Let us look at data confirming the relationship between focus and extraposition discussed above. Native speakers were asked to evaluate sentences like (6)-(8) with and without extraposition, where the main part of the object consisted of a noun or of a question word.¹³ The results are shown in *Table 1*.¹⁴ This data confirms the analysis: question words (which inherently have a focus feature in Chechen) can *only* occur within the relative clause part of a noun phrase when they are *not* extraposed (as in line *g* of the table). As soon as a relative clause is extraposed, it can no longer contain a *wh*-word (as indicated by the * in the “Eval” column of lines *c* and *d*).

¹³ A sentence like (6) has S-O-V order, where O is in the specifier of the FocP, and S is in the specifier of a higher TopP (Komen 2007a).

¹⁴ When the object has a question word, it is labeled as O_q . The relative clause part of the object is identified as O_{RC} . Where the relative clause part contains a question word, it is labeled as $O_{RC,q}$.

Table 1 Acceptability of question words in relative clause

#		Order		Eval
a	O	V S	O _{RC}	ok
b	O _q	V S	O _{RC}	ok
c	O _q	V S	O _{RC,q}	*
d	O	V S	O _{RC,q}	*
e	O _{RC} +O	V S		ok
f	O _{RC} +O _q	V S		ok
g	O _{RC,q} +O _q	V S		ok
h	O _{RC,q} +O	V S		ok

2.5.2 Extraposed possessive clauses

The same features emerge when we compare questioned extraposed possessive phrases and “normal” possessive phrases. Take as a starting point the examples (9)-(12).

(9) [San] nastarsh ca lielara.

1s-GEN knee-PL NEG move-IMPF

‘My knees did not move.’

(10) [Hweenan]nastarsh ca lielara?

whose? knee-PL NEG move-IMPF

‘Whose knees did not move?’

(11) Nastarsh ca lielara [cigahw wash volchu stegan].

knee-PL NEG move-IMPF there live-PTC V-REL person-GEN

‘The knees of the person living over there did not move.’

(12) *Nastarsh ca lielara [michahw wash volchu stegan]?

knee-PL NEG move-IMPF where? live-PTC V-REL person-GEN

‘The knees of the person living where did not move?’

Native speakers were asked to evaluate different modifications of these sentences, where the position of the possessor varied and where part of the possessor was replaced by the question word *michahw* “where”. The results are shown in Table 2. The “normal” position for the Possessive Phrase (e.g. “my” or “whose?”) would be the specifier position, i.e. immediately preceding the noun that is possessed, as shown in lines (a) and (b) of the table. But the possessor can also be extraposed, as shown in (c) and (d), in which case only (c) is acceptable.

Sentence (d) is not acceptable, since the Possessive Phrase contains a question word (indicated by PossP_q), implying that it has a focus feature, and therefore needs to be part of a focus phrase.

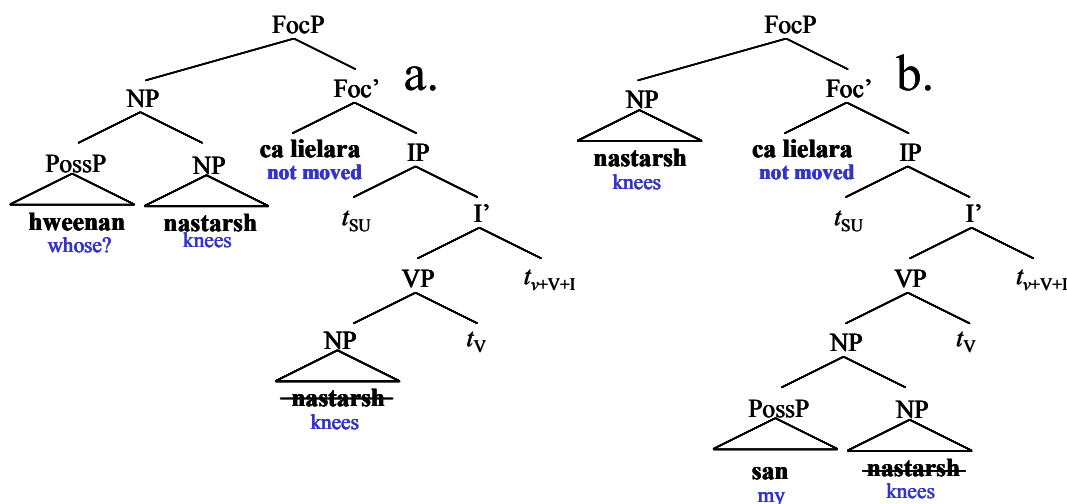
Table 2 Acceptability of question words in possessive clause

#	Order	Eval	Ref
a	[PossP N] Neg V	ok	(9)
b	[PossP _q N] Neg V	ok	(10)
c	N Neg V PossP	ok	(11)
d	N Neg V PossP _q	*	(12)

The analysis of possessive phrases runs along the following lines, as illustrated by Figure 6. The whole noun phrase *hweenan nastarsh* is in a focus phrase, where the focus feature of the question word *hweenan* ‘whose’ can be checked. Pronunciation of the possessee can take place either within the focus phrase position (as in part a) or at the lower copy within the verb phrase (not shown).

In part Figure 6b) the possessor *san* ‘my’ has no focus, but the possessee *nastarsh* ‘knees’ does. For that reason *nastarsh* must appear in the focus phrase, while the possessor is adjoined to the copy of the possessee in the verb phrase.

Figure 6 Possessives



In both situations sketched in Figure 6 it is essential that the focus phrase is to the left of the IP— in other words, that the head of the focus phrase branches left.

3 Combining optimality theory and minimalism

It remains to be shown how heads can branch in different directions within a minimalist framework.¹⁵ Within minimalism the linear correspondence axiom is widely used as a mapping procedure between the hierarchical structure derived by a syntactic derivation and the linear output required for the phonological component. With a directionality approach this linear correspondence axiom cannot be used anymore. Instead, an optimality theoretical branching direction selection mechanism will be used. The question is *where* such a selection mechanism should be included in the otherwise minimalist derivation.

Section 3.1 touches upon some fundamental questions concerning the combination of OT and minimalism. I then turn back to the Chechen data, but this time from the perspective of optimality theory. Section 3.2 shows how the branching constraints can be used to describe the general preference of the Chechen language to have left branching specifiers but right branching heads (Grimshaw 2001, 2006). Continuing the discussion in section 3.3, I introduce context sensitive variants of some existing branching constraints, which enable us to describe the different behavior of Chechen Focus phrases and the extraposition data. The introduction of these constraints give rise to speculations about what could be found in other languages, were the orderings of constraints different.

¹⁵ I realise that branching directions have been used *before* minimalism using a parametric approach. Good arguments have been provided in favour of accepting language specific directionality instead of a universal strict branching scheme (Ackema and Neeleman 2002, Abels and Neeleman 2007). But I have not found attempts to show how directionality should be implemented *within* the minimalist program, although some come close (Haider 1997, Broekhuis 2006).

3.1 Some fundamental questions

There are some fundamental questions that need to be answered in order to see how an optimality theory branching selection scheme could be combined with minimalism. The question at which point within the derivation a branching selection mechanism should apply is addressed in section 3.1.1, while I consider implications for the syntax-phonology interface in section 3.1.2.

3.1.1 *The level at which OT should be applied*

The optimality theory branching selection mechanism could be applied at (a) the level of the merge operation, (b) after the completion of an XP, (c) at the end of the complete derivation.

Option (a) does not allow alignment to the edge of an XP.¹⁶ Option (c), though possible, is surplus to requirements since the branching selection scheme does not really need to have the global information supplied at the end of a derivation—it only needs the information contained in a complete XP. Therefore let us consider how option (b) works, where the optimality theoretic branching direction scheme is applied right after the formation of every XP.¹⁷

The process can be illustrated by the noun phrase *ocu beq'achu qaachanax* ‘that dry food’ in example (13).

- (13) I shi' sutara tasavella [ocu beq'achu qaachanax].
 these two-ABS greedily entangle-V-PSTN that-OBL dry-OBL food-MAT
 ‘The two of them greedily got onto that dry food.’ (*Ajdamirov 2007*)

¹⁶ The edge of the XP needs to be taken into account with a constraint such as LEXHEAEDGE, saying that a lexical head should be at the edge of an XP (Zepter 2002).

¹⁷ The point at which the formation of an XP is finished does *not* necessarily coincide with the phases. The formation of an PP, for instance, finishes as soon as it merges with a projection realized by a different head (e.g. an element of an NP). But a PP is not traditionally seen as a phase.

Two merge steps are needed to complete the whole NP, leading to a hierarchical structure of $\{ocu, \{qaachanax, beq'achu\}\}$. This structure consists of a specifier, a head and a complement.¹⁸ At this point a branching selection mechanism is needed to choose the candidate that is most optimal for Chechen, as illustrated in Table 3.

Table 3 Branching selection at the level of XP

Input: Spec={ocu} _{DemP} , Comp={beq'achu} _{AdjP} , Head={qaachanax} _N	
a. \curvearrowright	{spec _{DemP} (ocu), {comp _{AdjP} (beq'achu), head _N (qaachanax)}}
b.	{spec _{DemP} (ocu), {head _N (qaachanax), comp _{AdjP} (beq'achu)}}
c.	{{ comp _{AdjP} (beq'achu), head _N (qaachanax)}, spec _{DemP} (ocu)}
d.	{{ head _N (qaachanax), comp _{AdjP} (beq'achu)}, spec _{DemP} (ocu)}

The question is which kind of constraints provide enough flexibility to allow for all the variation in different languages, yet restrictive enough to not overgenerate. Zepter has a mixed scheme. He uses a few branching constraints that only look at the local relationship (i.e. HEADLEFT, HEADRIGHT and BRANCHINGRIGHT), while others look at the structure of the whole XP (e.g. LEXHEADEDGE). For our purposes it is enough to use three gradient branching constraints, which count the number of syntactic objects to the left or right boundary of an XP (see Grimshaw 1993, 1997, 2001, 2006 and also section 3.2).

If we choose to apply a branching selection mechanism on completion of an XP, we need to know when such completion occurs. I argue that the completion of an XP is marked by either of the following two situations:

¹⁸ I am treating the Adjective *beq'achu* as a complement here for the sake of the argument. More evidence would be needed to substantiate this.

-
- (14) a. Whenever a head Y^0 (functional or lexical) is merged into an existing syntactic object of type XP. It is then that you know that XP is complete.
- b. Whenever a derivation finishes. It is then that you know that the last XP is complete.

The OT branching selection mechanism can be applied at each of these two points, and the branching direction of specifiers and complements in the top XP projection of the hierarchy created thus far can be adjusted according to the winning candidate.

Linearization (in the sense of transforming the 2-dimensional hierarchy into a 1-dimensional string) of the completed XP at this point is not yet possible, in my view, because the process of chain reduction still has to take place at the end of the derivation. That process still requires the hierarchical structure.

3.1.2 *The interface*

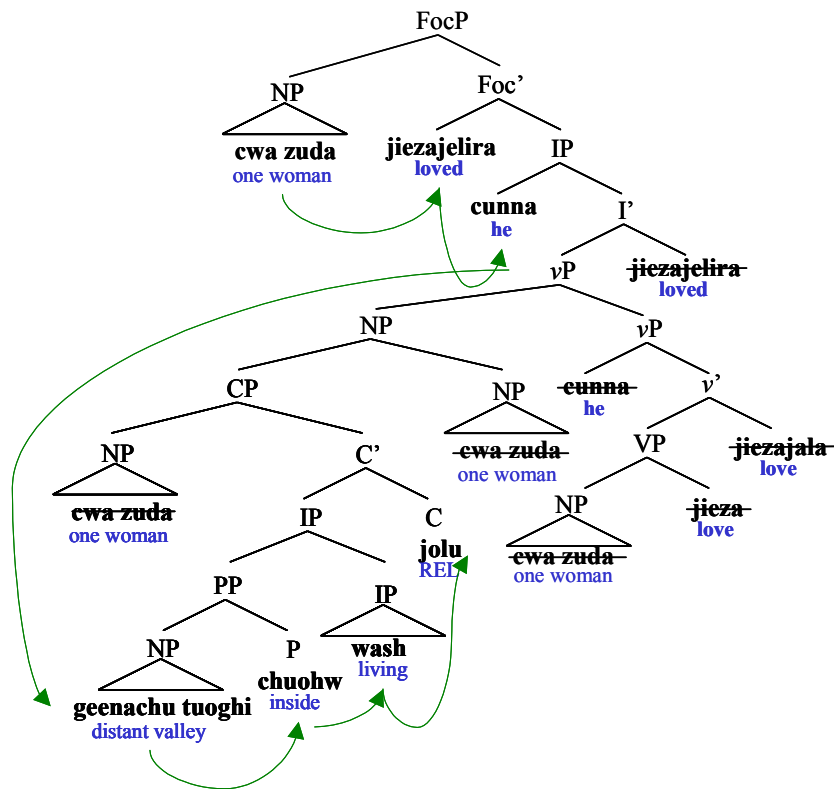
Under strict branching the interface between the syntactical structure and the phonology component provided by optimality theory was very simple: first chain reduction applies to “cross off” syntactic objects that are not supposed to be pronounced, followed by a one-to-one mapping from the structure to the phonological output, due to the strict branching. Let us now see how the hierarchical structures that result as output of the syntax component by employing a branching selection scheme can be fed into the phonological component in a similarly straightforward way.

Suppose a sentence with an extraposed relative clause as in (7), repeated here as (15), has been built up by the syntax component. At that point branching direction constraints have been applied, resulting in an ordered hierarchical structure. The tree representation of this sentence is as shown in Figure 7.

- (15) Cwa zuda jiezajelira cunna, [geenachu tuoghi chuohw wash jolu]
 one woman-ABS J-love-RFPS 3S-DAT distant-OBL valley-DAT inside live-PTC J-REL
 ‘He fell in love with a woman that lived in a distant valley.’

In order to feed this to the phonological component, first chain reduction applies, so that several copies of *cwa zuda* ‘one woman’ and the subject *cunna* ‘she’ in the vP are crossed-off. Then the tree is walked from left to right, from top to bottom and up again (as indicated by the arrows). That results in the correctly ordered output for the phonology component.

Figure 7 Hierarchical structure of example (15)



3.2 Context free branching constraints

In section 3.1 several important fundamental questions were raised pertaining to when and how an optimality theory branching direction selection scheme could be combined with an otherwise minimalist derivation. As explained in 3.1.1, I will regard the branching direction selection scheme to apply after the finishing

of every XP, and I will mainly use the branching direction constraints introduced by Grimshaw (2006) in (17) and (18).

- (16) HDLEFT Align(Head, Left, XP, Left).
Align the left edge of the head with the left edge of the XP containing the head.
- (17) SPECLEFTAlign(Specifier, Left, XP, Left).
The specifier of a projection should be as close to the left edge of the projection as possible.
- (18) COMPLEFT Align(Complement, Left, XP, Left).
The complement of a projection should be as close to the left of the XP containing it as possible.

These constraints are gradient ones. The counting is in the number of syntactic objects (although counting in words would give the same results). For the SVO language English Grimshaw showed that the following branching scheme is valid:

- (19) SPECLEFT >> HDLEFT >> COMPLEFT


For the SOV language Chechen I argue that the following general branching scheme is valid:

- (20) SPECLEFT >> COMPLEFT >> HDLEFT

That COMPLEFT >> HDLEFT can be seen from a postpositional phrase such as the one shown in (21). The complement *geenachu tuoghi* should be left of the head *chuohw*. For this reason the constraint COMPLEFT outranks HDLEFT, as shown in the tableau in Table 4.

- (21) [PP [NP geenachu tuoghi] chuohw]
distant-OBL valley-DAT inside
 ‘In a distant valley’

Table 4 Ranking of a postpositional phrase


Input: Hd(chuohw) Comp(geenachu tuoghi)	SPECLEFT	COMPLEFT	HDLEFT
a. [PP chuohw [NP geenachu tuoghi]]		*!	
b.  [PP [NP geenachu tuoghi] chuohw]			*

That SPECLEFT >> HDLEFT can be seen from a noun phrase such as the one shown in (22). The specifier *vajn q'ooman* ‘of our nation’ should be left of the nominal head *stag* ‘person’. The same clause also illustrates that SPECLEFT >> COMPLEFT, since the specifier should be left of the complement *dika* ‘good’.

- (22) [NP [_{POSSP} *vajn q'ooman*] *dika stag*]
IP-INC nation-GEN good person-ABS
 ‘A good person of our nation’

The constraint ranking for this noun phrase is exemplified in Table 5. The winning candidate is (c), which coincides with (22), so confirms that the correct ranking scheme has been made.

Table 5 Ranking of a noun phrase

Input: Hd(<i>stag</i>), Spec(<i>i</i>), Comp(<i>dika</i>)	SPECLEFT	COMPLEFT	HDLEFT
a. [NP [<i>vajn q'ooman</i>] [_{N'} <i>stag dika</i>]]		*!*	*
b. [NP [_{N'} <i>dika stag</i>] [<i>vajn q'ooman</i>]]	*!*		*
c.  [NP [<i>vajn q'ooman</i>] [_{N'} <i>dika stag</i>]]		*	**
d. [NP [_{N'} <i>stag dika</i>] [<i>vajn q'ooman</i>]]	*!*	*	

In the next section I will show that the three constraints need to be extended by one or two more for the focus phrase (and the topic phrase) to end up into the right position.

3.3 Context sensitive branching constraints

Since the focus phrase, and possibly the topic phrase, have a left branching head in Chechen, I introduce constraints capturing this in section 3.3.1, and I discuss typological consequences of these constraints in section 3.3.2.

3.3.1 Introducing context sensitive branching constraints

Let us consider context sensitive variants of the generic branching constraints that were introduced in section 3.2, like for example HDLEFT(FocP) as defined in (23).

(23) HDLEFT(FocP)Align(Head, Left, FocP, Left).

The head of a focus phrase should be as close to the left edge of the focus phrase as possible.

No independent motivation for this constraint is needed, since it is a more specific variant of the already existing generic HDLEFT.

With context sensitive constraints it is possible to capture the non-uniform branching scheme from a language like Chechen. While the normal HDLEFT constraint is completely at the bottom in the general branching scheme for Chechen, this HDLEFT(FocP) and the HDLEFT(TopP) constraints need to be somewhat higher. I suggest a ranking scheme for Chechen as sketched in (24).

(24) SPECLEFT >> HDLEFT(FocP), HDLEFT(TopP) >> COMPLEFT >> HDLEFT.


The ranking of HDLEFT(FocP) can be illustrated by looking at example (25). In this example the subject *nastarsh* ‘knees’ of the intransitive verb *liela* ‘move’ is focused. The possessor of the subject, *san* ‘my’, does not have a focus feature, and therefore has adjoined to the copy of the subject that is inside the *vP*. This situation is graphically shown in Figure 6b).

(25) *Nastarsh ca lielara san*
knee-PL NEG move-IMPF 1S-GEN
 ‘My knees did not move.’

What needs to be ascertained here is whether the ranking scheme I proposed in (24) delivers the correct result in this situation. The input to the selection scheme is the unordered, but labeled set of three syntactic objects: Head = *ca lielara*, Complement = *san* and Specifier = *nastarsh*.¹⁹ The four output candidates (a)-(d) in Table 6 are the only possible candidates faithful to the input labeling (provided that FocP is the highest projection, and no CP is above it).

¹⁹ The head is a compound consisting of the phonologically empty Foc^0 and the $\text{I}^0 + \text{v}^0 + \text{V}^0$ that have adjoined to it. The possessive *san* is complement of this Foc^0 , and the noun *nastarsh* is specifier of the FocP.

Table 6 Ranking a clause with an extraposed possessor

Input:	Hd(ca lielara), Cp(san), Sp(nastarsh)	SPECLEFT	HDLEFT(FocP)	COMPLEFT	HDLEFT
a.	[_{FocP} [_{Foc'} ca lielara [_{IP} san]] nastarsh]	*!*		*	
b.	[_{FocP} [_{Foc'} [_{IP} san] ca lielara] nastarsh]	*!*	*		*
c. 	[_{FocP} nastarsh [_{Foc'} ca lielara [_{IP} san]]]		*	**	*
d.	[_{FocP} nastarsh [_{Foc'} [_{IP} san] ca lielara]]]		*!*	*	**

The winning candidate coincides with the actually observed Chechen clause in (25). This confirms that the correct ranking has been chosen.

The non-uniform branching-scheme of a language like Tzotzil can also be derived with a context-sensitive variant of the generic branching constraints. In Tzotzil the word order normally is head-complement-specifier (VOS), so that in general the ranking scheme in (26) is used.

(26) HDLEFT >> SPECLEFT, COMPLEFT

When the subject is focused, the order SVO results. This difference in branching can be captured by introducing a context-sensitive variant of the SPECLEFT constraint, leading to a ranking scheme such as (27).

(27) SPECLEFT(FocP) >> HDLEFT >> SPECLEFT, COMPLEFT

3.3.2 Typology

The three general branching constraints SPECLEFT, COMPLEFT and HDLEFT can be put into ranking schemes together with the newly introduced constraint HDLEFT(FocP), resulting in 24 possible ranking schemes. Although most of these identify languages with uniform branching, there are 5 ranking schemes that identify languages with mixed directionality, as shown in Table 7. Each line in this table represents one ranking scheme. The word order within the winning

candidate for the focus phrase is given in the column labeled “FocP Order”. As a representative for other phrases the winning candidate for the ν P is given in the columns labeled “ ν P Order”.²⁰

Row (e) shows the ranking scheme of Chechen, which is normally spec-comp-head, but for the Focus Phrase it is spec-head-comp. Note that in row (b) the winning candidate is *not* the order OSV, since this is not possible within the hierarchical structure of the ν P.

Table 7 Ranking schemes using the HDLEFT(FocP) constraint

	Ranking	FocP Order	ν P Order
a.	HDLEFT(FocP) >> COMPLEFT >> HDLEFT >> SPECLEFT	[_{FocP} [_{Foc'} FocHd Comp] FocSp]	[[OV]S]
b.	HDLEFT(FocP) >> COMPLEFT >> SPECLEFT >> HDLEFT	[_{FocP} [_{Foc'} FocHd Comp] FocSp]	[[OV]S]
c.	HDLEFT(FocP) >> SPECLEFT >> COMPLEFT >> HDLEFT	[_{FocP} [_{Foc'} FocHd Comp] FocSp]	[S[OV]]
d.	HDLEFT(FocP) >> SPECLEFT >> HDLEFT >> COMPLEFT	[_{FocP} [_{Foc'} FocHd Comp] FocSp]	[S[VO]]
e.	SPECLEFT >> HDLEFT(FocP) >> COMPLEFT >> HDLEFT	[_{FocP} FocSp [_{Foc'} FocHd Comp]]	[S[OV]]

In like fashion the general branching constraints can be extended with the context sensitive SPECLEFT(FocP), which was argued to be operative in Tzotzil. From the 24 resulting ranking schemes most, again, identify languages with uniform branching. Those identifying languages with mixed directionality are shown in Table 8. Rows (c) and (d) in this table illustrate Tzotzil, where the normal head-comp-spec order becomes spec-head-comp.

²⁰ Note that the column ν P Order does *not* necessarily give the unmarked order observed in the language. There may still be movement to the inflectional phrase IP. For instance VSO word order in the unmarked clause can be the result of ν P order of SVO, followed by raising of the verb to the head of IP.

Table 8 Ranking schemes using the SPECLEFT(FocP) constraint

	Ranking	FocP Order	vP Order
a.	SPECLEFT(FocP) >> COMPLEFT >> HDLEFT >> SPECLEFT	[_{FocP} FocSp [_{Foc'} Comp FocHd]]	[[OV]S]
b.	SPECLEFT(FocP) >> COMPLEFT >> SPECLEFT >> HDLEFT	[_{FocP} FocSp [_{Foc'} Comp FocHd]]	[[OV]S]
c.	SPECLEFT(FocP) >> HDLEFT >> COMPLEFT >> SPECLEFT	[_{FocP} FocSp [_{Foc'} FocHd Comp]]	[[VO]S]
d.	SPECLEFT(FocP) >> HDLEFT >> SPECLEFT >> COMPLEFT	[_{FocP} FocSp [_{Foc'} FocHd Comp]]	[[VO]S]

4 Conclusions and discussion

Looking closely at otherwise minimalist syntactic descriptions of the unmarked word order and the relative clauses in Chechen the conclusion is that right branching heads for NP, vP, VP, IP and CP are more likely than left branching ones. Left branching heads are not only required to account for the syntactic behaviour of focus phrases, but also for the behaviour of extraposed relative clause and possessive phrases. The branching direction of topic phrase heads is unclear, since topic phrases do not have overt heads in Chechen.

Generalizing the results for Chechen, I suggest that the branching direction of specifiers and complements should be treated as being language specific, and that minimalism should allow for right branching heads. One way to implement choosing branching directions in the minimalist framework is to adopt an optimality-theoretic selection mechanism using branching constraints. I have shown how the three branching constraints introduced by Grimshaw are able to provide a satisfactory account for most, but not all, of the branching in Chechen; the different behaviour of focus phrases shows that Chechen has a non-uniform branching scheme.

I have shown that context sensitive variants HDLEFT(FocP) and HDLEFT(TopP) of the generic HDLEFT constraint can be used to account for the Chechen focus data. These context sensitive constraints are a natural

continuation of the context free constraints already introduced by Grimshaw. Adopting projection specific branching constraints implies that other context sensitive constraints might be operative in other languages. I have illustrated this with the context sensitive constraint SPECLEFT(FocP), which is operative in a language like Tzotzil.

The point at which the branching direction selection mechanism applies has not been determined in this paper – it could apply at such a early point as at the level of the merge operation or it could apply just before the point of spell-out. More research will be needed to determine the pros and cons of any particular mechanism.

The implication of accepting language specific and phrase specific branching schemes is that strict branching – more specifically the application of the linear correspondence axiom – should be abandoned as a principle within minimalism. Mainstream theories within the minimalist program have made use of strict branching to provide a straightforward and simple feeding of the phonological component. Since the linear correspondence axiom is no longer available, we need another mechanism, possibly, as I have suggested, one which lines up the correct word order to be fed into the phonological component when the usual chain reduction applies first, and then the tree is walked from left to right.

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Deriving Pairedness in vP structure: Minimalist yet Optimal

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Minimalist accounts lack a natural theory of markedness, whereas Optimality-Theoretical accounts fundamentally encode markedness. We think the duality of interfaces assumed in Minimalism is a step towards explaining pairedness behavior, where a given language exhibits a marked/ unmarked pair of items occupying the same niche. We argue that while Minimalism articulates the derivational aspect of language, and underlies grammaticality, an Optimality Theoretic articulation of PF and LF is conceptually natural and explains pairedness behavior. We adopt this ‘hybrid’ account, first, to explain the existence of marked (often termed ‘reflexive’) and unmarked anticausatives in German, recently studied in depth by Schäfer [2007].

1 Introduction

One of the hallmark features¹ that distinguish Optimality-Theoretical (OT) approaches from the family of approaches found within the Minimalist Program (MP) is the ease with which OT articulates a theory of markedness. OT features two types of constraints: faithfulness constraints, which favor candidates that are like the input over those that differ from it, and markedness constraints, which favor candidates that have some configuration or property over those that lack it, or vice versa. Following Moreton [2004, 145], OT employs markedness constraints to represent “the tendency of a grammar to prefer certain surface forms over others, while faithfulness constraints represent the tendency to keep the output like the input.”

¹ Many thanks are due to Carmen del Parafita Couto and Hans Broekhuis for their comments and insight regarding this work. All errata and misstatements are solely the fault of the authors.

In contrast to the OT-framework, the MP lacks a natural notion of markedness. The assumption of discrete interfaces often dictates that the Sensori-motor (S/M) and Conceptual-intentional (C/I) do not independently vary; that a derivation must converge at both interfaces (e.g., namely, S/M and C/I); and that a form convergent at both interfaces is either grammatical, or not. As a result of the strictly derivational nature of structure building in Narrow Syntax, and the limited power of the representational components situated at the Interfaces, Minimalist approaches do not offer a theory of gradient markedness, nor do they permit correspondences between the interfaces.

In this respect, generalizations regarding correspondences between a form's phonetic manifestation and its semantic representation are difficult to couch in the MP, given that this approach holds to interfaces to be wholly separate, held in tandem by Narrow Syntax. However, Haiman [1983] and Haspelmath [1993, 2005] show that such correspondences are rife in the causative forms of languages: a causative form's relative phonological length is a predictor of its semantic yield. Haiman [1983] claims that in languages with multiple causative forms, relative phonological length of the causative is always seen to vary inversely with the causative's semantic directedness. Thus a language which possesses both a lexical causative and a periphrastic or syntactic causative form will realize the shorter form as the direct causative, with the requirement of an affected argument.

“If two causatives contrast within a given language...and they contrast semantically with respect to the conceptual distance between cause and result, then the conceptual distance between cause and result will correspond to the formal distance between cause and result” [Haiman, 1983, 783]

- (1) sa'â, ha na kee
cause NOM OPT eat

'Make him eat.' (=prepare food for him to eat).

- (2) s-kee
 cause=eat
 'Feed him' (= put the food directly into his mouth).
- (3) ni sa'â-de ha ni-nduu-kwa a-ri
 PAST-cause-he NOM PAST-become-red-I
 'He made me blush'
- (4) ni sa'â-kwa a-de
 PAST-cause-red-he
 'He painted (me) red.' [Haiman, 1983, 787].

Haspelmath [1993, 2005] observes, in fact, that the phonetic manifestation of the causative form corresponds with the productivity of the causative alternation.

Universal 24: [unrestricted] If the causal and the plain verbs have the same shape (=if a language has causal ambitransitives), the plain is always patientive/unaccusative, never agentive/unergative. [Haspelmath, 2005, 2]

- (5) The water boiled. We boiled the water.
 The shirt dried. The sun dried the shirt.
 The ice melted. The heat melted the ice.
 The glass cracked. The high note cracked the glass. [Hale, 2000, 159]
- (6) The child laughed. *The clown laughed the child.
 The baby cried. *The noise cried the baby.
 Loretta sang. *We sang Loretta. [Hale, 2000, 159]

Minimalist approaches have no straightforward way of tackling these correspondences, because they maintain that S/M and C/I are discrete and wholly

separate, and that structures generated in Narrow Syntax much converge at both interfaces [Chomsky, 2000]. The assumption of discrete interfaces dictates that S/M and C/I do not independently vary, such that a form is either grammatical, or not; for instance, a crash at LF is assumed to crash the whole derivation.

Schäfer [2007] recently argued that reflexive *sich* marked anticausatives in German are not transitive, as opposed to *se/si* reflexive anticausatives in Romance. While both marked and unmarked anticausatives in German occupy essentially the same niche (expressing an event without a overt causer), according to Schäfer [2007], the two are markedly distinct; unmarked anticausatives are standard intransitive unaccusatives, but reflexively marked anticausatives are syntactically transitive with an expletive agent in the form of the reflexive marking. Expletive arguments would seem to represent a challenge for purely derivational syntactic theories; insertions of semantically null structure inherently seem to satisfy a representational opus. However, the Minimalist Program lacks the natural notion of markedness to express why the German marked anticausative form should exist at all; German marked anticausatives are assumed to be grammatical in Schäfer [2007]’s approach, even though they are vacuously transitive and receive extra phonetic manifestation. Likewise, the Minimalist desiderata of the interfaces do not readily permit explanations of what sort of special relationship marked and unmarked anticausatives might have, or more generally, explanations of Haspelmath [1993, 2005]’s observation that the phonetic manifestation of a causative form seems to affect its semantic properties as well.

In this paper, we approach the problem of formally distinguishing grammaticality from markedness by assuming the former to be a property of the operations in Minimalist Narrow Syntax and by assuming the latter to be a property of the operations at the Interfaces. As such, we propose a ‘hybrid’ OT-MP framework, in which a Minimalist Narrow Syntax over-generates structural representations which are filtered by gradient OT grammars at the S/M and C/I interfaces. These interface OT grammars are independent, such that a structure can be said to be C/I “marked” and S/M “optimal”, or, conversely,

S/M “marked” and C/I “optimal”. Thus, the framework naturally derives the marked/unmarked pair distinction, as derivationally related structures are independently evaluated at the interfaces. The framework also captures “impossible” correspondences [Haiman, 1983, Haspelmath, 1993, 2005] between SM and CI without assuming direct communication between the interfaces. Finally, the OT approach enables explanatorily adequate explanations of the nature of the interfaces; we are able to reduce the conceptual burden of representational filtering mechanisms by using OT to derive these representational filtering mechanism from the interaction of cognitively grounded constraints. This is congruent with the Minimalist desiderata [Chomsky, 2000] that Narrow Syntax is perfect, whereas the Interfaces are optimal solutions to requirements imposed on them, and are the locus of variation.

We assume the Distributed Morphology [Halle and Marantz, 1993, 1994] (henceforth, DM) underpinnings of the Schäfer account as our approach to Minimalist Narrow Syntax. DM rejects the Lexicalist approach of having a special lexical module, and instead argues that the various roles assigned to the Lexicon can instead be distributed to various derivational units. DM holds that the lexical component of intrinsic word meaning is syntactically instantiated with a derivational unit termed a “root”, noted with a \checkmark . This root corresponds roughly to what is often called the lexical verb in other areas of Minimalist inquiry. The root is essentially featureless, and thus free to Merge with other syntactic forms, although is not often thought of as being a possible target for feature checking or Movement. DM also holds that category is not a primitive, but is a derived notion; in the notation, the category-endowing environment is manifest as *v* or *a*, etc., and can be said to demarcate the division between l-syntax and syntax. Because the root is free in its ability to Merge, in the DM approach, subcategorization is policed primarily in a separate, non-syntactic module, known as the Encyclopedia, which matches the root’s syntactic instantiation, and the surrounding syntax, with its conceptual meaning. The Encyclopedia, particularly on Schäfer’s approach, can be seen as filtering out conceptually infelicitous

forms from an overgenerating Narrow Syntax.

The paper proceeds as follows. First, we present and examine the Schäfer data and analysis, and show that the data are part of a larger, potentially universal tendency [Haiman, 1983, Haspelmath, 1993, 2005] which Minimalist accounts have trouble articulating. After presenting Schäfer's account, we attempt to move past ad-hoc stipulation of the Encyclopedia, instead striving to employ our OT-interface approach to derive the Encyclopedia (particularly, Schäfer's compelling substantiation of it as a continuum of gradient knowledge) as an artifact of OT conflict resolution, from violable, grounded constraints. We motivate our own approach by first demonstrating how Sorace and Legendre used Power Hierarchies to derive other continua. Subsequently, we present our own approach, using tableau for each of the C/M and S/I interfaces to derive the correspondence between German marked and unmarked anticausatives, and show more generally how C/M and S/I can seem to correspond with each other without direct communication between the interfaces. Finally, we conclude by situating the Schäfer phenomenon in a larger context of generalizations Haiman [1983], Haspelmath [1993, 2005] regarding causative behavior crosslinguistically.

2 Marked and Unmarked Anticausatives in Germanic

Schäfer [2007, 199] presents data for a distinction between what he terms marked anticausatives, where an apparently intransitive verb manifests with a reflexive form, and unmarked anticausatives, which exhibit no such form.

German Marked Anticausatives

- (7) Die Tür öffnet *sich*
 the door opens REFL
 'The door opens'

German Unmarked Anticausatives

- (8) Die Vase zerbricht.
the vase breaks
'The vase breaks'

Italian Marked Anticausatives

- (9) La finestra si è chiusa.
the window REFL are closed
'The window closed'

Italian Unmarked Anticausatives

- (10) I prezzi sono aumentati.
the prices are increased
'The prices increased'

Schäfer argues that this *sich/si* form is not a true reflexive; he also refutes the analysis of the form as a telicity marker [Folli, 2001]. On Schäfer's analysis, the form is syntactically transitive in German (and not Italian), and structurally akin, Schäfer [2006] argues, to a middle-voice construction. In Germanic, Schäfer argues, "sich" is an unbound pronominal which expletively fills the Agent role and external argument position, and thus permits vacuous causation to license anticausative meaning with a verbal root that is normally non-spontaneous. The intuition here is that a verb such as 'destroyed' or 'opened' may be difficult to use intransitively with anticausative meaning, by virtue of the inherently low spontaneity of destroying and opening events. The marked anticausative form, on Schäfer's analysis, allows the expression of anticausative meaning with vacuously transitive syntax. For these reasons, Schäfer avoids use of the term *reflexive*, as well as the term *unaccusative*, as do we, so as to make clear the critical distinction between the transitive structure of German marked anticausatives, and the unaccusative structure of all other anticausatives under consideration in this paper.

Schäfer demonstrates that dative causer attachment to unmarked German and Romance anticausatives yields an ambiguity between affectedness and accidental readings of the dative causation.

German

- (11) Die Vase zerbrach dem Hans (aus Versehen)
 the vase broke the.DAT John (by mistake)
 ‘John was affected by the vase breaking’

‘John unintentionally caused the vase to break’ [Schäfer, 2007, 58]

Italian

- (12) A Franco sono appassite tutte le piante in giardino (per
 to Franco are.3.PL wilted.PL all the plants in.the garden (by
 errore)
 mistake)
 ‘All the plants in the garden wilted on Franco’

‘Franco accidentally caused all the plants in the garden to wilt’ (p.c. Roberta D’Alessandro and Chiara Frigeni as cited in Schäfer p. 84)

Schäfer submits that Germanic but not Romance marked anticausatives with dative causers do not exhibit affectedness readings, which Schäfer takes to be diagnostic of verb transitivity; on his account, Germanic marked anticausatives are syntactically transitive and block the structure yielding the affectedness reading, whereas their syntactically intransitive Romance counterparts permit this structure.

German

- (13) Die Vase zerbrach dem Hans (aus Versehen)
 the vase broke the.DAT John (by mistake)
 ‘John was affected by the vase breaking’

‘John unintentionally caused the vase to break’ [Schäfer, 2007, 58]

German

- (14) Der Maria öffnete *sich* die Tür (*aus Versehen)
 the.DAT Mary opened REFL the door by mistake
 ‘The door opened unintentionally and Mary was affected by this’

*‘Mary unintentionally caused the door to open’ [Schäfer, 2007, 58]

This evidence leads Schäfer to argue for the following typology of verb forms vis á vis verb transitivity, with active forms (including transitives and unergatives) as the most transitive forms, and unaccusative verbs as the most intransitive form. In the Schäfer analysis, anticausative-III represents the unmarked anticausative, with unaccusative structure, whereas anticausative-I and anticausative-II represent the German and Italian marked anticausative, respectively.

Interpretation:	Syntax:	Spell-Out:
active:	[Agent [VoiceD, agent [V [Root]]]]	(active)
passive:	[Voiceagent [V [Root]]]	(non-active)
anticausative-I:	[Expl. [VoiceD, [V [Root]]]]	(<i>sich</i>)
anticausative-II:	[Voice [V [Root]]]	(non-active, clitic- <i>si</i>)
anticausative-III:	[V [Root]]	(unmarked)

[Schäfer, 2007, 237]

That the typology situates the German marked anticausative between the polar extremes of transitivity renders the observation that German marked anticausatives are not intransitive, but in fact, vacuously transitive with an expletive external argument. This marking on the verb, Schäfer argues, reflects

the verbal root's lower event spontaneity; the transitivization on the verb vacuously satisfies the requirement that non-spontaneous events be caused. On his analysis, Romance and German both exhibit anticausative-3, as intransitive unmarked anticausatives. Where Romance and German differ is that Romance selects the intransitive anticausative-II as its marked form, whereas German selects the transitive anticausative-I as its marked form. That Germanic marked anticausatives are transitive suggests that the *sich* form is expletive, which is exactly Schäfer's conclusion. It also follows that the Romance *si* form is not an argument position, but the Spellout of *v*.

For Schäfer, event spontaneity is the main determinant of whether a given verb in the anticausative niche manifests as marked or unmarked anticausative. A highly spontaneous form can appear anticausatively without phonetic marking, but a less spontaneous verb root can only project in the anticausative niche as a marked anticausative [Schäfer, 2007] in German or as a middle voice construction [Schäfer, 2006]. On his approach, the conceptual knowledge of root-denoted event spontaneity is contained in the Encyclopedia, in the form of a continuum from highly spontaneous events to less spontaneous events.

Thus, the DM approaches of this type do uphold the Minimalist desiderata of locating variation at the interfaces: languages and their subcategorization preferences vary in the way they map this continua onto different root classes and their structural environments. What is less clear, however, is whether these continua can be explicated further.

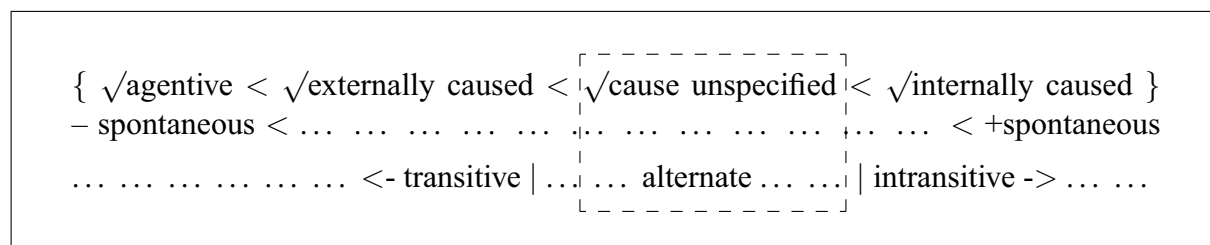


Figure 1: Schäfer 2007, Event Spontaneity Scale

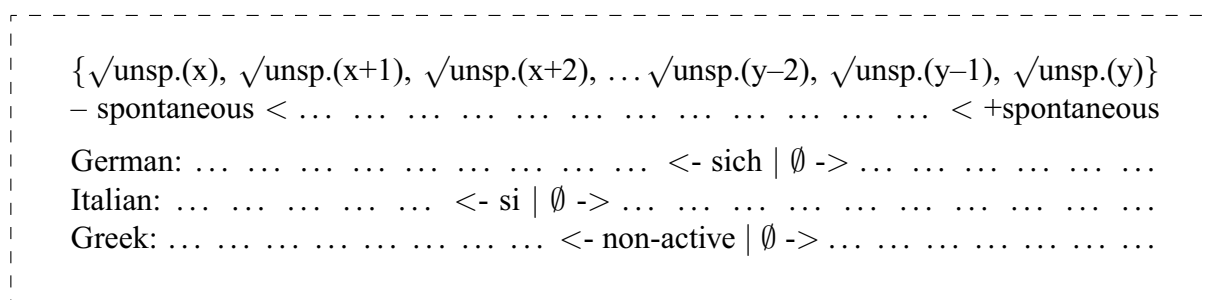


Figure 2: Schäfer 2007, Cross Linguistic Event Scale

3 The Limits of Minimalist Inquiry: PF/LF Independence, Conspiracy Effects, and Explanatory Adequacy

However, on Schäfer’s DM approach, event spontaneity is necessarily not a fact about syntactic structure, but is an interface fact; in Distributed Morphology the Encyclopedia is seen to regulate which forms can correspond to a given concept. There are two problems here, however, both which stem directly from Minimalist desiderata regarding the interfaces.

First, correspondences between a syntactic item’s phonological manifestation (reflexive marking on the anticausative) and its semantic manifestation (verbal event spontaneity) is not directly articulable in Minimalism, given that PF and LF are totally divorced from each other. Such a relationship, in fact, resembles a classic conspiracy effect of the type OT naturally accounts for. As pointed out by Kisseberth [1970], conspiracy effects, where multiple, but related, processes seem to converge towards or away from a target representation, emburden rule-based accounts. The problem conspiracy effects pose for rule-based accounts is that conspiracy effects involve multiple, related processes converging towards a representational onus, whereas the competing rule-based accounts of conspiracy phenomena are both redundant (as the multiple rules act separately on the same environment) and disjoint (as the multiple rules lack cohesive unity of purpose). We approach the German marked anticausative as a conspiracy effect. A highly spontaneous verb root is incompatible with an un-

accusative environment, so to express anticausative meaning, the structure must manifest as a vacuous causative with an oblique agent. This causative form in turn requires special phonetic marking in the form of an otherwise unbound pronoun; it is as if LF and PF processes were conspiring to save the anticausative construction as an expletive transitive, at the lesser cost of having an unbound expletive pronoun.

Second, the DM Encyclopedia is not derivational; as such, given the inventory of Minimalist tools, explanations from the Encyclopedia lack total explanatory adequacy (from the perspective of desiring explanatory adequacy for sub-categorization phenomena). We observe that Optimality Theoretic approaches have explanatory power to derive continuua such as those postulated in the Schäfer account in DM. For example, in the OT auxiliary selection literature [Sorace, 2000, Legendre and Sorace, 2003], continuua are shown to be derivable as a Power Hierarchy of violable constraints. Sorace [2000]’s Auxiliary Selection Hierarchy (ASH) (as cited in [3] [Legendre and Sorace, 2003, 3]), cross linguistically.

The Auxiliary Selection Hierarchy

CHANGE OF LOCATION	Selects “BE” (least variation)
CHANGE OF STATE	
CONTINUATION OF A PRE-EXISTING STATE	
EXISTENCE OF STATE	
UNCONTROLLED PROCESS	
CONTROLLED PROCESSES (MOTIONAL)	
CONTROLLED PROCESS (NON MOTIONAL)	Selects “HAVE” (least variation)

The organizing principle of the scale is thematic agency, as the scale tends to map events with a proto-Agent [Dowty, 1979] onto unergative verbs, and events with a proto-Theme [Dowty, 1979] onto unaccusative verbs. Verbs in the categories at either end of this continuum consistently project as unaccusative or unergative, but verbs near the continuum’s center will be seen to vary cross - and intra-linguistically. However, though the scale is intuitive, it is purely descriptive, and thus ontologically onerous. Thus, Legendre and Sorace seek to

derive the ASH within the Optimality-Theoretical framework, grounding (in the OT sense of the term) this relationship within constraints of the cognitive niche. As such, they present the following constraint ranking, deriving the ASH.

**1/TE* >> **1/DIR* >> **1/ST* >> **1/-CON* >> **1/MOT*²

Likewise, we seek to derive the Schäfer event-root conceptual continua from cognitively grounded, attestable constraints. Whereas Legendre and Sorace derive the unaccusative/unergative structural dichotomy with constraints based on thematic agency, we explore the transitive/intransitive dichotomy by examining constraints based on event spontaneity.

4 Deriving Encyclopedic Constraints

Here, we endeavor to derive the typology of marked and unmarked anticausatives in a way that intuitively highlights the relatedness of the items of the pair, whether they be intransitive (as is the case in Romance) or vacuously transitive (as is the case in *sich* marked German anticausatives).

We adopt the following model: a feature driven, non-cartographic Narrow Syntax, permitting the operations Merge and Move; distinct interfaces to C/I and S/M, each represented as a gradient Optimality-Theoretical grammar; a Distributed Morphology approach to syntactic decomposition of predicates, with a locus as the *v*P shell. The model is also notable for what it does not contain: the derivational array within Narrow Syntax supplants (or is a notational variant of) GEN; LF constraints (including, but not limited to, the constraints proposed in Legendre and Sorace [2003] derive the Encyclopedia, and specifically, Schäfer's Event Spontaneity scale contained within; the Lexicon is a DM Lexicon, "distributing" the Lexical module across syntactic head environments (*v*), Roots

² **1/TE* bans the occurrence of [+TELIC] on the external argument, whereas **1/DIR* bans directed change (themehood) on the subject. **1/ST* prohibits the subject from being stative, while **1/-CON* prohibits non-controlling subjects (potentially, instrument subjects). **1/MOT* prohibits motion subjects.

within Narrow Syntax, and lexicon specific world knowledge into the interface to C/I.

We thus propose the following grounded constraints.

Constraints at the LF Interface

- (15) **DEP-Caus-: Non-spontaneous events lacking Causers are marked.**
- (16) **Express-Participant (E-Part): Event Participants must manifest morphosyntactically.**
- (17) **BindPro: Expletives are semantically marked.**
- (18) **DEP- θ : Maximize Thematic Distinctions (The Gradient Theta Criterion)**

These constraints are motivated accordingly. **DEP-Caus-** reflects the Schäfer intuition that absolutely non-spontaneous events, such as destruction and consumption events, are required in the Encyclopedia to have a causer. As such, the expression of these events in an agentless intransitive verb, is marked.

- (19) **“The chair destroyed”*

On a Distributed Morphology account of the Lexicon, the *particular* subcategorization facts regarding the \checkmark *appear* root are the responsibility of the Encyclopedia, and not the syntax per se³. **Express Participant (E-Part)** reflects the intuition that event participants should be structurally instantiated; structurally implicit event participants are a violation of faithfulness to the event expressed. Accordingly, a breaking event is more optimally expressed by a sentence such as “I broke the chair with a hammer” than a sentence such as “I broke the chair”. The same constraint tends to punish unaccusatives, which lack (both syntactically and semantically) a causing argument. Notably, this constraint bears similarity to a constraint we will propose in PF, **DEP-ARG**, with the distinction that the LF constraint is concerned with the mapping of prototypical event

³ As opposed to generalizations regarding subcategorization behavior, such as thematic roles or the general behavior of the causative alternation, which can be addressed under the DM model in syntactic, and not interface, terms. This again reflects the Minimalist desiderata that variation is an interface property.

participants in the Encyclopedia with structure, whereas the PF constraint **DEP-ARG** is concerned with the mapping of structure to Phonological Form.

BindPro observes that expletive unbound pronominals, such as in weather events—“it rained”,—are marked forms. Likewise, *sich* in German marked anticausatives is an expletive pronominal which is marked at LF. **DEP- θ** reflects that a structure’s thematic roles should be maximally distinct from each other. An intransitive verb is unmarked in this regard, by virtue of possessing only one argument. A transitive verb with canonically proto-Agent and proto-Theme [Dowty, 1979] represents a relatively unmarked form in this regard.

Constraints at the Phonetic Form Interface

- (20) **PRONOUNCE: Pronounce terminals. (Purely functional heads are marked.)**
- (21) **Express-Subevents (E-Sub): Complex events are denoted by multimorphemic forms.- (verbalizing heads are pronounced).**
- (22) **DEP-ARG: Argument positions are pronounced.**
- (23) **DEP-ROOT: Preserve lexical faithfulness to the root: (languages prefer to have ambitransitive causative pairs).**

With the adoption of a Bare Phrase Structure system and the abandonment of claims to special lexical modularity, no a priori distinction can be said to exist between lexical and functional heads. Rather, the distinction is an empirical one, and held to be a property of the interfaces, specifically PF. Thus, **PRONOUNCE** holds that non-overt morphemes, whether functional or lexical, are generally marked, and that nonviolation of this constraints entails pronouncing all merged elements.

Alas, the other constraints at PF give special emphasis to the relevant constituents of argument structure. **Express Subevents (E-Sub)** gives special emphasis to the functional-verbal aspect of argument structure, and its phonetic manifestation. Complex event structures (in the sense of their syntactic instantiation, and not the conceptual edifice itself) should be more phonologically instantiated than simple event structures. *Vis á vis* this constraint, “He broke the chair” is a complex event, a causing (sub)event and a breaking (sub)event, and

is unfaithful to the extent that the causation (*Voice*) and verbalizing (*v*) are not manifest at PF. **DEP-ARG** likewise holds that argument structures with covert arguments are marked. Despite the superficial similarity to the LF constraint **Express Participant**, we make a critical distinction: **Express Participant** is a mapping from the derivation to LF, requiring a conceptual event participant to have a structural manifestation, even if that structural manifestation is itself covert, whereas **DEP-ARG** is a mapping from the derivation to PF, requiring a structurally instantiated argument to have a manifestation at PF. Thus, for **DEP-ARG**, “The chair was dropped” should be less faithful than “the chair was dropped by Fred”. Contextually available arguments, such as agents in passives, should be pronounced. Finally, **DEP-ROOT**, often in conflict with **E-Sub**, requires faithfulness to root structure. As such, ambitransitive causative pairs, such as “He broke the chair” / “The chair broke”, are optimal with regard to **E-Sub**, as “break” is relatively faithful to the root “break” in both causative and anticausative.

There probably exists at least some redundancy in our PF constraints, and there may yet exist some overlap between our event spontaneity constraints and those in the Legendre and Sorace set. However, for the present purposes of deriving pairedness, we argue that the ends of the sets of constraints are orthogonal to each other; as our constraints specify the possible inventory of anticausatives, saying relatively little about which roots may map onto these specific forms, whereas the Legendre and Sorace set is much more explicit as to how a particular verb type maps onto one of these particular forms. Suffice it to say, we leave the task of mapping particular roots to the typology of anticausative structures for future work.

As previously stated, in our approach to the interfaces, we locate grammaticality as a syntactic property and markedness at the interfaces. We maintained the Minimalist desiderata that LF and PF are separate, and are both interpretive only of the output of Narrow Syntax. We gained the ability to express what appears to be communication between the interfaces by reconceptualizing them

as gradient, allowing a single grammatical output to be differentially optimal at PF and LF. As such, with two OT grammars at the interfaces, we have to slightly reinterpret what an optimal form is: an optimal form, for the purposes of the analysis here, is a form that is both grammatical in syntax and emerges as the optimal candidate in one of the two interface grammars. In actuality, a form which is highly marked in PF or LF would probably not be admissible by the system in general. For our purposes, this level of split markedness is dampened by the scale of the constraints themselves, which tend to be connected to the number of arguments, subevents, and the like, and thus tend not to incur gross violations at one interface while emerging as optimal at the other.

Our first tableau correctly derives predicts that English exhibits a single, ambitransitive, anticausative form by generating a form which is optimal in both the LF and PF tableau. The structures are represented first by their natural language phonetic form, then their syntactic structures, with *v* representing the DM verbalizing element, the root represented with the \checkmark symbol, and θ indicating the internal argument. Notably, the candidate sets for LF and PF are slightly different, as the English-type unmarked anticausative and the Italian-type marked anticausative are only distinct at PF, and are identical structurally and at LF. Winning candidates are indicated in italics.

Tableau 1: EnglishLF: BindPro >> Exp-Participant >> DEP-Caus- >> DEP- θ

PF: DEP-ROOT >> PRONOUNCE >> E-Sub >> DEP-ARG

LF	\checkmark BREAK	BindPro	E-Part	DEP-Caus-	DEP-θ
<i>The chair broke</i>	$[v [\checkmark$ BREAK $\theta]]$		*		
The chair self broke	$[\text{sich} [\text{CAUS} [v \checkmark$ BREAK $\theta]]]$	*			
PF	\checkmark BREAK	DEP-ROOT	PRON	E-Sub	DEP-ARG
<i>The chair broke</i>	$[v [\checkmark$ BREAK $\theta]]$		*	*	
The chair self broke	$[[(v \text{ si}) [\checkmark$ BREAK $\theta]]]$	*		*	
The chair self broke	$[\text{sich} [\text{CAUS} [v \checkmark$ BREAK $\theta]]]$		**		*
LF	\checkmark OPEN	BindPro	E-Part	DEP-Caus-	DEP-θ
<i>The door opened</i>	$[v [\checkmark$ OPEN $\theta]]$		*	*	
The door self opened	$[\text{sich} [\text{CAUS} [v \checkmark$ OPEN $\theta]]]$	*			
PF	\checkmark OPEN	DEP-ROOT	PRON	E-Sub	DEP-ARG
<i>The door opened</i>	$[v [\checkmark$ OPEN $\theta]]$		*		
The door self opened	$[[(v \text{ si}) [\checkmark$ OPEN $\theta]]]$	*			*
The door self opened	$[\text{sich} [\text{CAUS} [v \checkmark$ OPEN $\theta]]]$		**		*

At PF, **DEP-ROOT** is violated only when v is pronounced (as *si*), as occurs in the Romance intransitive marked anticausative. **PRON** is unviolated when v is pronounced as *si*. It is violated once in the unmarked form, as unaccusative v goes unpronounced, while in the transitively marked, vacuous-causative case, it is violated twice, as both the verbalizing element v and the causative head *CAUS* are silent.

At LF, our ranking for English ranks **BindPro** higher than **DEP-Caus-**. This, coupled with the high ranking in PF of **DEP-ROOT**, prevents the vacuous causation strategy from applying; the LF constraints ban vacuous transitivization to give a non-spontaneous event an anticausative structural instantiation, whereas the PF constraints penalize expletives in general. As such, we predict that English does not exhibit a German-type marked anticausative. In PF, the high position of DEP-ROOT also requires that intransitives be faithful to the root, preventing v from manifesting phonologically (as it does in Romance anticausatives, according to Schäfer).

As for German, we argue that at the LF interface, it ranks **DEP-Caus** constraint higher than the **BindPro** constraint. At the PF interface, German ranks **E-Sub** high. The tableau correctly predicts that a German intransitive must be

phonetically unmarked; a marked anticausative can however be produced by vacuously transitivizing the verb, with an expletive external argument position (made relatively cheap by the low relative ranking of **BindPro**).

Tableau 2: German

LF: DEP- θ >> DEP-Caus- >> BindPro >> Exp-Participant

PF: E-Sub >> DEP-ROOT >> DEP-ARG >> PRONOUNCE

LF	$\checkmark OPEN$	DEP- θ	DEP-Caus-	BindPro	E-Part
Die Tür öffnet	[v [$\checkmark OPEN \theta$]]		*		*
Die Tür öffnet sich	[sich [CAUS [v $\checkmark OPEN \theta$]]]			*	
PF	$\checkmark OPEN$	E-Sub	DEP-ROOT	DEP-ARG	PRON
Die Tür öffnet	[v [$\checkmark OPEN \theta$]]				*
Die Tür öffnet sich	[(v si) [$\checkmark OPEN \theta$]]		*		
Die Tür öffnet sich	[sich [CAUS [v $\checkmark OPEN \theta$]]]			*	**
LF	$\checkmark BREAK$	DEP- θ	DEP-Caus-	BindPro	E-Part
Die Vase zerbricht.	[v [$\checkmark BREAK \theta$]]				*
Die Vase zerbricht sich	[sich [CAUS [v $\checkmark BREAK \theta$]]]			*	
PF	$\checkmark BREAK$	E-Sub	DEP-ROOT	DEP-ARG	PRON
Die Vase zerbricht	[v [$\checkmark BREAK \theta$]]				*
Die Vase zerbricht sich	[(v si) [$\checkmark BREAK \theta$]]		*		
Die Vase zerbricht sich	[sich [CAUS [v $\checkmark BREAK \theta$]]]			*	**

We correctly predict that the more spontaneous “break” event is optimal at LF and PF without expletive marking, similar to the English unaccusative anticausative. We also derive the prediction that the German marked anticausative strategy of vacuous causation is optimal at LF for the less spontaneous “open” event. However, the model overpredicts that “Die Tür öffnet” is a productive anticausative, as it is optimal at PF. We have no economical way of preventing this on the current model, other than to stipulate some weight of LF markedness relative to PF markedness. We admit that this is a shortcoming of the current model. However, we note that this is consonant with the intuition that violations in PF, such as those seen in the German marked anticausative, are more acceptable than violations at LF, such as “The chair destroyed”. We leave the resolution of this issue for future work.

However, in Italian, the relative high ranking of BindPro makes the vacuous transitivization strategy intractable; the high ranking of the PF constraint E-Sub permits the intransitive marked anticausative.

Tableau 3: ItalianLF: DEP- θ >> BindPro >> DEP-Caus- >> Exp-Participant

PF: E-Sub >> DEP-ROOT >> DEP-ARG >> PRONOUNCE

LF	\checkmark CLOSE	DEP- θ	BindPro	DEP-Caus-	E-Part
<i>La finestra si é chiusa.</i>	$[v [\checkmark$ CLOSE $\theta]]$			*	*
<i>La finestra si é chiusa.</i>	$[sich [CAUS [v \checkmark$ CLOSE $\theta]]]$		*		
PF	\checkmark CLOSE	E-Sub	DEP-ROOT	DEP-ARG	PRON
<i>La finestra é chiusa.</i>	$[v [\checkmark$ CLOSE $\theta]]$	*			*
<i>La finestra si é chiusa.</i>	$[[v si] [\checkmark$ CLOSE $\theta]]$		*		
<i>La finestra si é chiusa.</i>	$[sich [CAUS [v \checkmark$ CLOSE $\theta]]]$	*	*		**
LF	\checkmark INCREASE	DEP- θ	BindPro	DEP-Caus-	E-Part
<i>I prezzi si sono aumentati.</i>	$[v [\checkmark$ INCREASE $\theta]]$				*
<i>I prezzi si sono aumentati.</i>	$[sich [CAUS [v [\checkmark$ INCREASE $\theta]]]]$		*		
PF	\checkmark INCREASE	E-Sub	DEP-ROOT	DEP-ARG	PRON
<i>I prezzi sono aumentati.</i>	$[v [\checkmark$ INCREASE $\theta]]$	*			*
<i>I prezzi si sono aumentati.</i>	$[[v si] [\checkmark$ INCREASE $\theta]]$		*		
<i>I prezzi si sono aumentati.</i>	$[sich [CAUS [v [\checkmark$ INCREASE $\theta]]]]$	*	*		**

Again, we witness the same overgeneration problem as in German: although a marked anticausative form emerges as optimal at LF, the nonmarked form emerges at PF. Here, though, we fail to capture the distinction between the marked and unmarked forms in Italian, because on the current constraints, nothing is contingent in LF on the pronunciation of v . In general, we find that the unmarked forms in Italian and German reflect harmony between PF and LF, whereas the marked forms in the languages are LF optimal, but PF marked. We also capture the German strategy of vacuous causation, as the PF-marked candidate is made optimal at LF. German, resolves the conflict between the anticausative meaning and the inherent non-spontaneity of an “open” root by becoming vacuously transitive, and phonetically marking this with an expletive pronoun.

Our derivational approach to GEN as Narrow Syntax, intuitively articulates that a common derivational item can ship out to the OT interfaces, and can differentially manifest as an unmarked or marked form. On the other hand, a transitive, *sich* marked Germanic anticausative is derivationally related to the unmarked form; they are read off of different Spell-Outs, which allows our account to provide explanations for markedness pairs which bridge across the

intransitive/transitive divide. In order to motivate a Faithfulness-constraint approach to the same problem, we would be forced to argue for either the transitive or intransitive form as more natural, to serve as the input. This approach is not only stipulative, but empirically problematic given the convergence of recent work [Alexiadou et al., 2005, Pylkkänen, 2000] which suggests that neither the transitive or intransitive is a 'base' form for the derivation of the other, but rather that both transitive and intransitive verbs are derived structures.

5 Conclusion

5.1 Deriving the Interfaces

We showed that a revisualization of the interfaces as gradient, and moreover, as OT grammars, could account for two main problems in Minimalist approaches. First, representational constructs at the Interface, such as the continua posited by Schäfer, can be derived as OT grammars. The reason to adopt continua as opposed to a dichotomy is motivated by corner-case phenomena which behave as *x* for one diagnostic but not *x* for another. To this end, Legendre and Sorace examined cross-linguistic variation in split transitivity, by arguing that although the conceptual continua were universal, different languages map this continua onto structure differently. Subsequently, they achieved greater explanatory adequacy by deriving this descriptive continua from motivated, grounded constraints, centered around the concept of thematic agency. Similarly, we took Schäfer's continua as given, but sought to derive it from grounded constraints centered around event sponaneity.

5.2 Impossible Correspondences between LF and PF

Also, we showed how our hybrid approach could explain "impossible" correspondences between PF and LF. Given Minimalist recieved wisdom, if the derivation is to converge at both interfaces, it stands to reason we should never

seen derivations ‘inversely vary’, as both PF and LF share in the burden of determining grammaticality, via the ‘Crash’ mechanism. Yet exactly such a phenomenon seems to be operant in the Schäfer data. In German marked-anticausatives, a non-spontaneous event, at the conceptual level, is expressible as an anticausative iff: the event is mapped onto a transitive structure; this transitive structure has an expletive argument in the form of the reflexive marking; this expletive reflexive is manifest phonologically.

This relationship is not articulable in Minimalism, given that Minimalism holds that the derivation must converge at both interfaces. Yet, the Schäfer data is not epiphenomenal, but part of a much larger trend. In the literature on causatives [Haiman, 1983, Haspelmath, 1993, 2005], exactly such a relationship exists: in languages with multiple causative forms, the forms seem to vary inversely in phonological and semantic requirements.

Our approach naturally deals with impossible correspondences of this type. By actualizing the interfaces as gradient OT grammars which filter output from Narrow Syntax, the right correspondence between marked and unmarked pairs is achieved by allowing the constraints at the separate interfaces to be in conflict with each other—the very factors that mark a form more LF optimal will often serve to make it marked at PF, and vice versa. In German, marking the anticausative form for a nonspontaneous event solves the Encyclopedia problem in LF—the high degree of event spontaneity is mitigated by the transitivization of the verb. At the same time, the marking is ‘marked’ at PF—the expletive reflexive is highly marked. Thus, on our approach, markedness is an interface property, and can vary with the interfaces: a form can be optimal at PF but marked at LF, or marked at LF and unmarked at PF.

One of the innovations of our hybrid framework is that it is well-situated on conceptual grounds. We distinguish in a natural way grammaticality from markedness; it is a property of the computational system—any form which is optimal is grammatical, but not vice versa. Gradient variation is treated at the interfaces, as part of the distributed Lexicon; Narrow Syntax employs no more

than Merge and Move; and lexical factors can be addressed without resort to a distinct module with special generative operations, but rather, as filtering effects over syntactic products. We also move towards increased groundedness; Merge and Move are grounded within the recursive computational system, thought to be ‘perfect’, whereas our PF and LF constraints are grounded within the general cognitive niche, thought to be optimal and imposed on the syntax by the demands of language.

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The papers contained in this issue share the insight that the different components of the grammar sometimes impose conflicting requirements on the grammar's output, and that, in order to handle such conflicts, it seems advantageous to combine aspects from minimalist and OT modelling. The papers show that this can be undertaken in a multiplicity of ways, by using varying proportions of each framework, and offer a broad range of perspectives for future research.

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