PHRASE STRUCTURE DIRECTIONALITY:

HAVING A FEW CHOICES

by

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ABSTRACT OF THE DISSERTATION

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The thesis claims that the linear organization of specifier, head and complement in a phrase and throughout a syntactic tree is determined by a conflict between general violable constraints on X-bar-structure. The adopted framework is Optimality Theory (cf. Prince & Smolensky 1993; in syntax, cf. Grimshaw 1997). The proposed constraint system explains why phrase structure directionality is mostly uniform and why only some non-uniform cases exist, while other logically possible kinds of mixed directionality are unattested.

Central to the dissertation is the idea that head-initial oriented languages have a greater structural conflict to resolve inside their lexical projections than head-final languages: The combination of a general preference for [head - complement]-order and for a left-peripheral specifier bars the lexical head from surfacing at an edge of the phrase. The combination of a general preference for [complement - head]-order and for a left-peripheral specifier still allows alignment at one edge. This greater conflict can be resolved in different ways, which leads to slightly more variation among head-initial oriented languages: Not only do we find uniform SVO-languages, but we also find VOS-languages, VSO-languages and head-initial oriented languages with a head-final verb phrase. On the primary examples of the Mayan VOS-language Tzotzil, the 'strict' VSO-language Yosondúa Mixtec, and the 'mixed-headed' languages German and Persian, I show that mixed directionality is not arbitrary in its ways of deviating from uniformity. The proposed system derives various implicational universals capturing the persistently systematic nature of phrase structure directionality. The predictions made about the verbal domain have systematic correlations in the domain of all other categories.

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"Jedes Bild ist ein bis zur äussersten Grenze
vorangetriebenes Scheitern"
Joseph Fassbender, 1903 - 1974

Chapter 1 – Introduction

This thesis claims that the linear organization of specifier, head and complement in a phrase and throughout a syntactic tree is determined by a conflict between general violable constraints on X-bar-structure. This will explain why phrase structure directionality is mostly uniform and why some non-uniform cases exist. I will show that mixed directionality is not arbitrary in its ways of deviating from uniformity. The proposed system derives various implicational universals capturing the persistently systematic nature of phrase structure directionality, and it will also explain why other kinds of mixed directionality do not emerge.

The framework adopted is Optimality Theory (cf. Prince & Smolensky 1993; in syntax, cf. Grimshaw 1997). I will feature six core constraints which formalize the following structural restrictions:

(i)   A head precedes its complement. (HEAD LEFT; introduced in chapter 2).

(ii)   A head follows its complement. (HEAD RIGHT; introduced in chapter 2).

(iii)   Of two non-terminal sister nodes, the one that is part of the extended projection line follows. (- Specifiers, phrasal adjuncts, complex functional heads precede their sister nodes; BRANCHING RIGHT; introduced in chapter 2).

(iv)   A lexical head surfaces at an edge of LexP. (LEX HEAD EDGE; introduced in chapter 2).

(v)   An XP which is part of a clause has a specifier. (GENERALIZED SUBJECT; introduced in chapter 2).

(vi)   A case assigning head is syntactically adjacent to a lexical head which governs all of the case assignees. (CASE LEX; introduced in chapter 3).

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The conflict between these constraints and its resulting factorial typology will predict the existence of more than one underlying directionality pattern, at the same time restricting the possible choices to *a few* in number. Why is this desirable?

First, considering the typological work on basic word order, we see that a high percentage of the world's natural languages show uniform phrase-directionality across different categories (cf. Greenberg 1963, 1966, Dryer 1992, Hawkins 1988). For example, in a uniformly head-final language, the head always appears at the end of the phrase, no matter whether we look at a verb phrase, noun phrase, adpositional phrase etc. See in (1) how in Japanese, the head-final pattern which leads to 'object - verb'-order is mandatory in phrases of other categories as well:

(1)   Japanese ((a, b) cf. Tsujimura 1996:292, 172; (c, d) cf. Fukui 1993:413):

    a.   Taroo-ga [kuruma-o]$_O$ katta$_V$.

           Taroo-*nom*   car-*acc*   bought

           "Taro bought a/the car."

    b.   Taroo-ga [[Hanako-ga oisii   susi-o   tukutta] -to$_C$] itta

           Taro-*nom*   Hanako-*nom* delicious sushi-*acc* made   COMP said

           "Taro said that Hanako made delicious sushi."

    c.   [New York] -de$_P$ d.   [New York -de -no] koogi$_N$

           New   York   in   New York   in   NM   lecture

           "in New York"   "lecture in New York"   NM = nominal marker

In contrast, a uniform SVO-grammar such as English mirrors the Japanese pattens in the sense that not only does the verb precede the object, but heads of other categories also precede a dependent phrase which would be followed by the head in Japanese:

(2)   English:

    a.   Alex writes$_V$ [a thesis about small turtles]$_O$.

    b.   He said [that$_C$ [she should explore the desert]].

      c.   about_P [small turtles]   d.   a dissertation_N [on phrases]

Now, assuming a Principles & Parameter-Theory (cf. Chomsky 1981, 1995), we can explain the phenomenon of uniform phrase structure directionality, and the frequency with which it emerges, by saying that all languages share the same hierarchical organization of phrase structure, and a general parameter determines the head-directionality of all categories at once. That is, a language chooses either the [head - complement]-value, which results in a head-initial language such as English, or it decides on the [complement - head]-value, resulting in a head-final language such as Japanese. In Optimality Theory, this analysis has been re-interpreted by attributing the typological variation to the resolution of a conflict between category neutral universal alignment constraints (cf. Grimshaw 1997; for alignment constraints in phonology, McCarthy & Prince 1993). While the constraint HEAD LEFT demands a head-initial pattern, HEAD RIGHT calls for a head-final one. A language specific ranking HEAD RIGHT >> HEAD LEFT results in a grammar which favors head-finality cross-categorically. The opposite ranking HEAD LEFT >> HEAD RIGHT causes the opposite orientation.

      The idea of a general head-parameter, and with it the idea that both [head - complement] and [complement - head] are proper underlying orders, has been challenged by the proposal of the Linear Correspondence Axiom (LCA; cf. Kayne 1994). If we assume the LCA, then only [adjunct/specifier [head - complement]] is a possible underlying form, and every diverging surface variation is derived by leftward movement.

      Since Kayne made his proposal, a lot of attention has been given to the LCA. Not only does the axiom seem to offer a strong generalization, which is that all languages share the same underlying form, it furthermore explains the frequency of left-peripheral specifiers (and phrasal adjuncts) as opposed to specifiers that align on the right of their sister node. This preference is apparent in both uniform SVO- and uniform SOV-grammars, as the subjects, evidently in specifier positions, precede their sister constituents yielding a basic 'subject-initial' order.

      The LCA, according to Kayne, is an unviolable principle of Universal Grammar. Therefore, it prohibits any underlying [complement - head]-directionality. Thus, clear cases of strictly uniform head-final-languages cannot be analyzed as simple mirror-images of strictly

uniform [head - complement]-languages. Instead, head-finality must be derived by movement: Only if for each category, a particular trigger motivates the appropriate leftward movement, can a language like Japanese emerge. Kayne himself doesn't necessarily assume that movement must be 'triggered' by a particular feature (cf. Chomsky 1995), but keep in mind that, in order to derive a head-final pattern in an LCA-based theory, *some* cause, not necessarily a feature, must be distinguished to ensure that movement always applies. This cause cannot be left random, since if movement does not always happen, we do not obtain a head-final pattern but one that is sometimes head-final, sometimes head-initial. This does not, however, necessarily exclude the possibility of a cross-categorical movement trigger. That is, in order to re-capture the cross-categorical uniformity, one could, for example, suspect the existence of a general trigger of leftward 'complement-movement'. Just as a general parameter on head/complement-ordering decides on the directionality for all categories at once, so would a general movement trigger which targets more than one category.

This thesis proposes another, new, approach to the question of how the order between specifier, head and complement is determined and to the phenomenon of cross-categorical uniformity. It is a solution which further develops Grimshaw 1997's idea of general, *violable* constraints on alignment, but also acknowledges the original insight of the LCA that Universal Grammar strives for a partly asymmetric phrase structure. The reason for pursuing a new solution lies behind what we can learn from the occurrence of grammars with mixed phrase structure directionality. At first sight, these non-uniform cases appear to challenge the idea that universal grammar only includes category-neutral parameters, or category-neutral alignment constraints, or maximally general movement triggers. Let me introduce three key examples of mixed word order: the SOV/SVO-language German which shares its kind of mixed directionality with other Germanic OV-languages, with Persian, and Latin, then the VOS-language Tzotzil which gives us a typical example of the directionality in VOS-languages in general, and lastly, the VSO-language Yosondúa Mixtec which represents the most common variant of VSO (cf. database in Julien 2000:475-496, Julien 2002: Appendix 2, 330-356).

First, consider German. Taken at face value, the head in German neither always precedes nor always follows its complement. Rather, there seems to be a contrast between the verb phrase, in which the verb comes at the end, and other categories such as nouns, adpositions, determiners

and complementizers, all of which precede their respective complements. See some examples in (3) below. (3a) gives a subordinated clause, with the complementizer *dass* in clause initial position; meanwhile the main verb follows the subject and the object, and is itself only followed by the finite auxiliary. In (3b), we have a PP with the adposition in initial position, and in (c), the noun is to the left of its complement:

(3)   German:

a.   ..., **dass$_C$** [[die Gräfin]$_S$ [den Butler]$_O$ **küssen$_V$ wird$_{Aux}$**]

            that   the countess   the butler   kiss   will

        "..., that the countess will kiss the butler."

b.   **unter$_P$** [dem Tisch]   c.   das **Buch$_N$** [über Planeten]

        under   the   table   the   book   about planets

        "under the table"   "the book about planets"

Hence, the German noun phrase and also PP and CP pattern with English, whereas the verb phrase patterns with what we have seen for Japanese in (1). Many linguists have analyzed the German verb phrase as being underlyingly head-final (see, for example, Bach 1962, Bierwisch 1963, Reis 1974, 1985, Koster 1975, Thiersch 1978, den Besten 1977, 1989, Haider 1986; more recently in particular Haider 2000, also Vikner 2001:ch.3.); but since the proposal of the LCA, many others have re-analyzed German as being a uniform [head - complement] -grammar plus appropriate movement operations in/out of the verb phrase (see, for example, Zwart 1993, Zwart 1997, Hoekstra 1997, Hinterhölzl 2000, Taraldsen 2000, Koopman & Szabolcsi 2000).

    Consider next the Mayan VOS- language Tzotzil. Aissen 1987, 1992, 1996 has analyzed Tzotzil as a grammar which cross-categorically projects the head to the left of its complement. More interestingly, it has left-peripheral functional specifiers but right-peripheral lexical specifiers. Thus, the language's basic order 'verb - object - subject' is attributed to a verb phrase directionality in which the specifier follows its sister node inside VP. Functional specifiers, on the other hand precede their sister nodes, capturing the fact that, for example, *wh*-phrases and focus-phrases surface left of the verb phrase. This contrast is illustrated in (4), with the subject *li vinike* 'the man' in (4a) in final position, and the *wh*-phrase *buch'u* 'who' in (b), as well as the

focus-phrase *vaj* 'tortilla' in (c), in clause-initial position:

(4)   Tzotzil (cf. Aissen 1996:450,451):

   a.   **I-s-pas$_V$ [mantal]$_O$ [li vinik-e]$_S$.**
          Asp-A3-do   order   the man-ENC
          "The man gave the order."

   b.   **[Buch'u]$_{wh-S}$ s-pas$_V$ [mantal]$_O$?**
                        who   A3-do   order
          "Who is giving the order?"

   c   **[Vaj]$_{foc-O}$** no la s-k'an$_V$ s-ve'$_V$ [li Xun-e]$_S$.
          tortilla   CL CL A3-want   A3-eat   the Xun-ENC
          "It's only tortilla that Xun wants to eat."

As a third paradigm case, consider the Mixtecan language Yosondúa Mixtec. Yosondúa Mixtec also consistently projects the head left of its complement. In addition, the verb precedes the subject as well as the object. Thus, the verb appears left of a specifier on the surface, yielding a basic order 'verb - subject - object'. Unlike the well-studied Celtic languages (cf., for example, Chung & McCloskey 1987, Koopman & Sportiche 1991, McCloskey 1991, 1996, 1997), 'V - S - O'-order in Mixtec is particularly consistent. Yosondúa Mixtec never switches to an 'S - V - O'-order, not even in the presence of a higher finite verb which picks up the tense information. This is shown in (5a) below, with the 'V - S - O'-sequence preceded by a finite modal. Notwithstanding this, however, it is not impossible for phrases to occur at the left-periphery of the clause, as, for example, *wh*-phrases are fronted into either a functional specifier or an adjoined position (see (5b)):

(5)   Yosondúa Mixtec (data cf. Farris 1992:29, 36):

   a.   **Kúã$_{Modal}$**   sáh~$_V$ d~$_S$ Nnʃĩã$_O$.
          POT:be:possible POT:do   he   work
          "He can work."

b.　　[N~ã chaa]$_{S\text{-}wh}$　ni　xahan$_V$　[xíín ní]?

　　　what man　　　COM COM:go　with you:RES

　　　"Which man went with you?"

What do these mixed word order cases tell us about the factors that determine word order in general?

First of all, no matter which theory of phrase structure directionality we believe in, in order to account for the emergence of mixed patterns, the theory must involve more components than just those that predict uniformity. Then, is the challenge *just* a matter of which structures the mixed word order cases exactly correspond to? The more general question is what the possibility of mixed cases tells us about the universal principles that frequently produce uniform cases, alongside with a few non-uniform ones. Now, think about it in terms of the LCA: there should be no doubt that each of the above cases could be analyzed on the grounds of an LCA-based theory. Just as English and Japanese corresponded to a syntactic tree with solely
[spec [head - complement]] -directionality, so would German, Tzotzil and Yosondúa Mixtec. The difference between them becomes a difference in terms of what moves to the left. As noted, German has been so analyzed, and VOS-languages such as Malagasy have been as well (see, for example, Pearson 2000).

The point here is not that the mixed patterns of German or Tzotzil couldn't be derived by a fair amount of leftward movement, the point is: which mixed pattern couldn't? That is, the price of such a solution is the serious potential of over-generalization. This is a danger which is just as vivid as in any account that randomly allows for more freedom in the underlying directionality. That the latter approach easily over-generalizes is quite obvious. Just take the set of four categories {N, V, A, P}, and assume that for each category, an independent parameter determines whether the head precedes or follow its complement. This alone gives us a typology of 16 different types, 14 of them have mixed head directionality, and only two types in which all categories agree with respect to either [head - complement] or [complement - head]-order. This typology will evidently include mostly unattested types, and moreover, due to the much higher number of mixed cases, the approach makes the occurrence of a language with uniform word order a mere 'accident'. But what is even worse is the fact that any account which uses category

specific parameters or the like entirely fails to recognize any systematic aspect to the phenomenon of mixed directionality. This is also a threat to any LCA-based theory. Consider the following key question:

(i)   Why do we find only certain kinds of mixed directionality cases and not some others which are logically just as possible?

For example, given that we find, on the surface, both strictly uniform head-initial and head-final languages, why don't we find a mirror image of the German kind of non-uniformity? 'Reverse-German' would be a grammar in which the verb precedes the object in the basic order, but, at the same time, functional heads such as complementizers systematically occur in a right-peripheral position. Logically, such a language is perfectly possible. 'Reverse-German' could correspond to a grammar with left-peripheral lexical heads but right-peripheral functional heads. Likewise, if we think within an LCA-based theory, 'Reverse-German' can still be derived. Above, we noted that a uniform head-final language could be the result of a rather general movement trigger which shifts any complement to the left. Considering German, such a general device is not suitable, since, while there is a basic 'O - V'-order in subordinated clauses, complementizers nevertheless are left of their IP-complement. Consequently, in order to account for the difference between Japanese and German, we must distinguish a specific trigger for 'IP-to- Spec, CP'-movement, which is active in Japanese but not in German. Once, we introduce such a trigger, we can not exclude the possibility that the trigger is active in some grammar X, which has on the surface 'V - O'-order.

Significantly, though, looking at the broad typology, we find a clear contrast. According to Dryer 1992:102, while (surface) OV-languages with sentence-initial complementizers exist, VO-languages with sentence-final complementizers do not. Hence, a 'Reverse-German'-grammar appears to be unattested. Why is that?

Similarly, imagine the case of an 'Anti-Tzotzil'-grammar. 'Anti-Tzotzil' would be a grammar in which the subject precedes a 'V - O'- (or even an 'O - V') -sequence in the basic order, but at the same time, any *wh*-, focus- and topic-phrase occurs at the right-periphery of the clause. It is quite unlikely that 'Anti-Tzotzil' exists. See here, for example, Gundel 1988:231

who observes that within a sample of 30 languages (compared in an attempt at broad genetic and regional representation; cf. p.232, fn.1), none has right-peripheral topic phrases. As well, see Sadock & Zwicky 1985:185, who note that "interrogative proforms (- *wh*-phrases) are often found in focus or topic position, which for many languages is sentence-initial position", or they occur "in the same position as a non-interrogative form". The empirical option of a systematic right-dislocation of *wh*-phrases is however not mentioned. Bach 1971 already noted the typological absence of this option. Once more, why is that? From a logical perspective, we can easily think of a syntactic tree which corresponds to 'Anti-Tzotzil'. This is either one in which the *wh*-/focus-/topic-phrase is in a left-peripheral specifier but the corresponding complement is systematically shifted to an even higher specifier. Or, it is a syntactic tree which simply combines left-peripheral lexical specifiers with right-peripheral functional specifiers (thus, the perfect mirror image of Aissen's Tzotzil analysis).

It is the objective of this thesis to strive for a theory of phrase structure directionality which minimizes the danger of over-generalization, and as such, aims for a system that allows for a *restricted* set of possible patterns.

Rather than adopting an 'everything is derived'-solution or category-specific ordering parameters or the like, this thesis proposes a system that is set in the framework of Optimality Theory, and constitutes a further development of the system of syntactic alignment constraints proposed by Grimshaw 1997, 2001. No order of two syntactic sister nodes will be excluded axiomatically. This means that, for example, both [head - complement] and [complement - head] is a possible underlying form, and so are both left-peripheral and right-peripheral specifiers. Instead, the key is to recognize a conflict between *general but violable constraints* on the ordering of syntactic nodes. This will open a window that will enable us to avoid over-generalization: the system's factorial typology consists of only a restricted set of types, only these are predicted to emerge empirically. In this set, we will not only find grammars with uniform phrase structure directionality, but also *a few* cases of mixed directionality. Over the course of the thesis, we will repeatedly see that mixed phrase structure directionality is systematic and far from random. Among many other typological predictions, the proposed system will derive the following two generalizations:

(6)   Only languages with a head-final verb phrase, i.e. underlying OV-languages, can show

non-uniform head/complement orders across different categories.

(7)   Only languages with a head-initial verb phrase, i.e. underlying VO-languages, can have

right-peripheral lexical specifiers.

Given (6) and (7), the system predicts a particular kind of asymmetry in the emergence of syntactic structure. The system allows grammars that generate trees with either systematically left-peripheral or systematically right-peripheral heads, and it allows a clause structure that combines left-peripheral functional heads over right-peripheral lexical heads (as given in German and alike). But it does exclude the opposite combination, it excludes 'Reverse German'. In parallel, while the system allows right-peripheral lexical specifiers, it excludes right-peripheral functional specifiers, such that a grammar like Tzotzil is accounted for, but 'Anti-Tzotzil' is predicted to be impossible. Both (6) and (7) together furthermore entail that a grammar can deviate from an elsewhere preferred directionality only along one dimension, either with respect to head/complement-order or with respect to specifier directionality.

The thesis is structured as follows: Chapter 2 introduces the core system and discusses the factorial typology it derives. This chapter focuses on the domain of the verb phrase; at the same time, it outlines on a more general level which kinds of directionality patterns the system includes and excludes and how this is achieved.

Chapter 3 extends the focus on the verb phrase by taking the inflectional layer into active consideration, and the question of how it influences the possible options in basic word order. The chapter adds one additional constraint to the proposed set. This will accomplish an explanation for the apparent impossibility of languages with basic 'T - S - V - O'-order (T corresponding to an independent tense or aspect morpheme). Overall, chapter 3 demonstrates in which ways the constraints on directionality also determine both verb- and subject movement into the inflectional layer.

Chapter 4 shifts the focus from the verbal to the nominal domain. It shows how the extended system, without any additional assumptions, correctly accounts for typological variation in the order of a noun and a possessor genitive phrase that correlates with a grammar's

basic 'V - O'- or 'O - V'-order. We will see that the system explains why SVO-languages can have either a pre-nominal or post-nominal genitive, whereas VSO- and VOS-languages always have a post-nominal genitive, and SOV-languages mostly have a pre-nominal genitive. Beyond this, the system will derive the implicational universal: 'SVO-languages that have verb movement into the inflectional layer have a post-nominal genitive'.

Chapter 5 discusses both adjective phrases and adpositional phrases, with a focus on the word order in German. The chapter addresses the possibility of non-uniform directionality *within* a particular category and distinguishes a few reasons why this can occur.

Finally, chapter 6 returns to the domain of verb phrases and clauses, illustrating how the system, without any additions, captures the possibility of another kind of mixed directionality, observable in the Kru languages of Africa (cf. Koopman 1984).

Chapter 7 gives a conclusion. An appendix is added with the complete factorial typology derived by the six proposed constraints.

Chapter 2 – The lexical layer: Giving it an Edge

This chapter defines and illustrates the main concepts of a system which has three crucial properties. First, the system maintains the idea that languages can be uniformly head-initial or head-final; that is, both [head - complement] and [complement - head] are proper orderings, and can be the one-and-only choice of a particular language. Second, the system predicts the occurrence of *a few* language types with mixed phrase directionality, all of which can be shown to be attested. Third, the system *ex*cludes certain mixed patterns which are logically possible but do not seem to occur in natural language.

      While we draw a conceptual outline of how both uniformity and restricted non-uniformity are grounded in the interaction of universal but violable constraints on X-bar-structure, the special focus will be on what I'd like to propose as one of the main factors causing non-uniformity: a constraint that I call LEX(ICAL) HEAD EDGE. It forces **lexical heads to surface at the edge of their local phrases**, that is, **closer to the edge than any complement or specifier.**

      Crucially, LEX HEAD EDGE demands this edge alignment without specifying one particular edge. Both a left-peripheral and a right-peripheral orientation are equally satisfactory to this constraint. However, any configuration, in which a lexical head surfaces *between* specifier and complement, or surfaces outside its lexical domain (in a functional projection), violates LEX HEAD EDGE. It is likewise essential that the preference of edge alignment does not target functional but *lexical* heads, that is (following Baker 2003), verbs (V^0, v_v^0), nouns (N^0) and adjectives (A^0). This will introduce a particular pressure on lexical projections which can lead to certain mixed directionality patterns, depending on the ranking of the entire set of constraints introduced below. The mixed patterns contrast the order within FP with the order in LexP, as such revealing an essential difference between the two phrase types. 'Marked' directionality is possible in LexP, but FP is preferably the domain in which the grammar's unmarked 'elsewhere' ordering emerges.

      Based on LEX HEAD EDGE, we can identify a set of distinct language types with mixed word order as driven by the same cause, which is the pressure of having lexical heads at the edge

of the phrase. All languages share the characteristic of preferring the configuration
[spec [head - comp]] in other environments, and the mixed patterns are the result of answering
the needs of LEX HEAD EDGE in different ways. We will recognize three major choices:

(A)   The 'right-peripheral specifier'-choice satisfies edge alignment by pushing lexical
        specifiers from left to right, deciding on a [[head complement] spec]-configuration, as
        opposed to the otherwise preferred [spec [head complement]]. This will give us VOS-
        languages like the Mayan ones (primary example: Tzotzil), which have right-peripheral
        lexical specifiers but left-peripheral functional specifiers.

(B)   The 'head movement'-choice meets edge alignment by jumping the head over a specifier,
        such that the configuration includes an additional lexical projection without a specifier:
        [head [spec [t_{head} complement]]]. This will give us 'strict' VSO-languages like the
        Mixtecan ones (primary example: Yosundúa Mixtec). These languages always show
        VSO-order, independent of the higher functional context and the presence of other verbs
        besides the main verb.

(C)   The 'right-peripheral head'-choice meets edge alignment by forcing a head behind its
        complement, deciding on a head-final [spec [complement head]]-configuration instead of
        the elsewhere preferred [spec [head comp]]. This will give us mixed SOV- languages like
        a subset of the Germanic ones (primary example: German), and also languages like
        Persian, which project head-initial functional layers above a head-final verbal phrase.

At a later stage (chapter 3 and 4), we will see how LEX HEAD EDGE can help us to gain new
insights into the systematic nature of lexical head movement and how it is possible to draw a
correlation between lexical head movement in the verbal and the nominal domain.

Altogether, the proposal of LEX HEAD EDGE is the main theme of this chapter, since it
instantiates a crucial example for the idea brought forward above that a certain amount of
variation in phrase structure is real, permitting even some non-uniform cases. However, this does
not lead to the conclusion that the grammatical principles responsible for this variation target
only these non-uniform cases, rather than being universal principles. Instead, it points to the
conclusion that phrase structure variation is the result of the violable status of the constraints

involved. Recognizing the possible interactions of LEX HEAD EDGE with other general constraints, we see a concrete example of how one single factor can disturb structural uniformity in several ways, without allowing over-generalizations to enter by the back door. On the contrary, the same factor will help us to understand why some alternative types of non-uniformity do not occur. In this way, LEX HEAD EDGE enables us to recognize that *non-uniformity* is still systematically driven rather than random.

In this chapter, I start in section 2.1 with outlining the minimal axiomatic assumptions that we have to make at this point. I then define five constraints in section 2.2. These include HEAD LEFT, HEAD RIGHT and a GENERALIZED SUBJECT constraint, which all follow the work of Grimshaw (1997, 2001). The fourth is LEX HEAD EDGE, and the fifth I will call BRANCHING RIGHT. The proposal of BRANCHING RIGHT draws on Haider's Branching Constraint (BC; Haider 1993, 2000), and it is doubtlessly inspired by Kayne 1994's point on the relevance of asymmetry in directionality. BRANCHING RIGHT introduces a preference for left/right-asymmetries concerning the directionality of specifiers, phrasal adjuncts and complex functional heads. All these must align left-peripherally in order to obey BRANCHING RIGHT.

Having defined the basic set of constraints, which will stay with us in the further chapters, sections 2.3 to 2.6 work through the general typology predicted by re-ranking the members of this set. Finally, section 2.7 discusses which types the typology excludes, and section 2.8 compares the proposal to some alternatives. The entire discussion of this chapter focuses on the clausal domain, but even more particularly on VP. Chapter 3 will extend the 'clausal focus' by considering the inflectional layer's influence on basic word order.

One last point worth mentioning in advance: chapter 6 will later reveal that BRANCHING RIGHT can build up pressure as well, leading to an additional kind of mixed directionality pattern, one in which complex functional heads involving head-to-head-adjunction precede their complements, while simple heads follow. (The pattern is exemplified by languages like Vata and Gbadi, following the description of Koopman 1984.) The current chapter focuses on the mixed patterns introduced by pressure of LEX HEAD EDGE; at the same time it demonstrates how a principle on the asymmetric nature of syntactic structure, in this system BRANCHING RIGHT, can gain explanatory force if it is understood as a violable constraint.

2.1 X-bar-Structure and Extended Projections

The two fundamental axioms of the system explored below are first, binary X-bar-Structure and second, the concept of Extended Projection. Before I discuss them briefly, I'd like to add one short comment on the choice of the first axiom.

Relying on X-bar-Structure as a primitive notion might be considered disputable in light of the fact that X-bar-Structure could be *derived* by the LCA (Linear Correspondence Axiom; cf. Kayne 1994) which makes it therefore obsolete. All that seems required is the assumption of the LCA as an inviolable principle. However, as noted in the introductory chapter, the possible downside of taking the LCA as absolute is that we have to justify a significantly larger derivational apparatus, in order to account for all kinds of typological variations which de facto exist. As we said then, this wouldn't necessarily qualify as an objection except for the fact that it opens up a back door for over-generalization. Now, the current challenge for us is to aim for a slightly more surface-oriented analysis of basic word order variation. It is then a necessary requirement to allow for a less restricted underlying form. In this respect, X-bar-Structure seems like the best available template to work with: it allows adjuncts to occur freely, it allows co-occurrence of phrasal adjuncts and specifiers, multiple head-to-head-adjunction, and most crucially, it doesn't include any restrains on directionality.

It is also worthwhile mentioning that, beyond deciding on X-bar-Theory, the above point contra absolute principles is ultimately a more general one. We want to investigate how far we can reach with a system of violable, interacting constraints, which implies that rather little should be given on an absolute level. Consequently, we should prefer an axiomatic base which is the least restricted. Still, the position taken here is that a bare minimum of hierarchical organization *must* be axiomatic, and that X-bar-Theory offers a good working-hypothesis precisely because it defines such hierarchical organization without restricting syntactic structure much further.

With these motives made clear, our investigation starts by building on some of the basic assumptions made by Grimshaw 1997:376 in her application of Optimality Theory to syntax: 'GEN incorporates a minimal X-bar-Theory'. To spell out a concrete working hypothesis, I will follow Stowell 1981's original version of X-bar-Theory, and thence break it down into three inviolable sub-axioms:

(1)   (i)   Every maximal X^0 projects an intermediate phrase level X', then a maximal
                      phrase level XP.

XP

ǂ

X'   (ii)   A head must not be the mother node of a projection.

ǂ   (iii)   Branching of syntactic structure is no more than binary.

X^0

In (1), we have three propositions which have to be satisfied by every possible well-formed syntactic representation. The restricting effects are:

First, given (i) (with a maximal head understood as a head whose mother node is not a head), syntactic heads always project a two-leveled phrase, unless they are adjoined to some other head. Consequently, a plain X^0 can never occur in complement- or specifier position of another head, nor can it directly adjoin to another projection, and neither can a plain $[_{X'} .. X^0 ..]$-projection.[1]

The second clause (ii) gives us the effect that a projection, which includes both X' and XP, can never adjoin to a head; the third restriction in (iii) is self-explanatory.

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[1]This still leaves the structural option that two heads might 'co-project' a phrase; the possibility of such 'hydras' was explicitly claimed by Baker 1989. Note that (1) also doesn't say anything about the impossibility of projections that lack a head entirely (due to universal quantification over heads as opposed to quantification over projections). That this is legitimate was explicitly argued by Grimshaw 1997:408. See however also rejections of this view in Bakoviv 1995:§1.2, 1998:38; in parallel, Vikner 2001:159 only allows for the possibility of "XP with completely empty X^0".

At this point, I follow Grimshaw and refrain from prohibiting head-less XPs entirely, primarily in order to restrict GEN as little as possible. I take it however as considerably difficult to distinguish the 'actual reality' of a projection without *any* head, or even with a *completely empty* head. First, how do we seriously empirically differentiate between an *absent* head and an *abstract* head? Second, conceptually, if we think of a phrase as being, by definition, the projection of a head, then this should imply that the 'projecting' entity indeed exists, let it alone be to determine whether the head is LexP or FP, or which FP etc..

As a side remark, notice that the impossibility of adjoining heads to projections (which here falls out of (i)) does not follow under an absolute assumption of the LCA. Neither is the impossibility of adjoining projections to heads (here given by (ii)) fully derived. Equally, the LCA, like X-bar-Theory, allows for the possibility of head-less projections. For the relevant discussion and proofs, see appendix B. I mention this, in order to clarify that a claim 'LCA derives X-bar-Theory' should not be taken as a guarantee that the LCA in fact restricts pure dominance relations; a minimal amount of stipulation is still needed either way.

Now, (1) does not establish any restrictions on the relation of dominance and linear ordering. This is exactly what we want from the axiomatic base. That is, given solely X-bar-Theory, complement and specifier, which can (but do not need to) be contained in XP, can be ordered relative to the head both ways. Furthermore, where

(a), nothing rules out YP-adjunction to XP (or to X'),

(b), head-adjunction to X^0 is a possible option (cf. Baker 1988), and

(c), specifier and adjuncts can freely co-occur,[2]

then, nothing in GEN determines the linear ordering of the corresponding terminals.

Let us briefly introduce the second axiom: Besides binary X-bar-Structure, we also want to assume the theory of Extended Projections (*ep*), following Grimshaw 1991, 2000 (see also Haider 1988, van Riemsdjik 1990), and Grimshaw 1997's application of the concept to Optimality Theory. The relevant definitions are given in (2):

(2)   Concept of Extended Projection (*ep*):

(a)   Perfect projection (cf. Grimshaw 1991:3):=

x is the perfect head of *y*, and *y* is a perfect projection of *x iff*:

(i) *y* dominates *x*;

(ii) *y* and *x* share all categorial features;

(iii) all nodes intervening between *x* and *y* share all categorial features;

(iv) the F value of *y* is the same as the F value of *x*.

---

[2]While not explicitly explored in the current project, there might furthermore exist the option of 'multiple specifiers'; cf. Chomsky 1995:355ff. (1) does not rule this out either.

(b)   Extended projection (cf. Grimshaw 1991:3):=

x is the extended head of *y*, and *y* is an extended projection of *x* *iff*:

(i) *y* dominates *x*;

(ii) *y* and *x* share all categorial features;

(iii) all nodes intervening between *x* and *y* share all categorial features;

(iv) if *x* and *y* are not in the same perfect projection, the F value of *y* is higher than the F value of *x*.

Following Grimshaw 1997, syntactic candidates are extended projections such that functional categories do not select lexical heads, but on the contrary, they are dependent on them. Lexical heads provide the 'base' for any phrase and build functional projections as their extensions.

The basic distinction between the *perfect* and an *extended* projection of a lexical head is important to be aware of. We have said above that a phrase XP is minimally the maximal projection of a head X^0 (with X' between X^0 and XP). Now, take X^0 to be a lexical head V^0, then X' = V' and XP = VP. Both V' and VP are *perfect* projections of V^0. If V^0 builds another VP-shell, by simple recursion of V^0, (cf. Larson 1988) then any corresponding higher V' and VP is also a perfect projection of the bottom lexical head projecting it. In distinction to this, when we generate a functional projection above VP, say TP, this TP is certainly a perfect projection of T^0. But TP does not count as a perfect projection of V^0, but as an *extended* projection thereof (V^0 being an *extended* head of TP).

That said, there is a further refinement to add. Acknowledging recent theories on the *layered* structure of VP (which assume, at the minimum, that all transitive verbs split into *v* and V; cf. Hale & Keyser 1993, Chomsky 1995:315, Kratzer 1993, 1996, Chomsky 1999, Baker 2003:79), this conception is merged with the concept of Extended Projection as follows: Every transitive (and unergative) verb corresponds to a V^0 which extends into v^0, with V assigning the object-2-role(s) (such as THEME) and *v* assigning the subject-2-role (such as AGENT). Furthermore, V *lexicalizes* v^0 by substitution. That is, minimally, we have the following syntactic structure (with random directionality):

(3)   Transitive active verbs:[3]

$$vP$$

```
              vP
            /    \
    AGENT_Subj    v'
                /    \
             v_v^0    VP
                    /    \
              THEME_Obj   V'
                        /    \
                      t_V     PP/GOAL_Obj
```
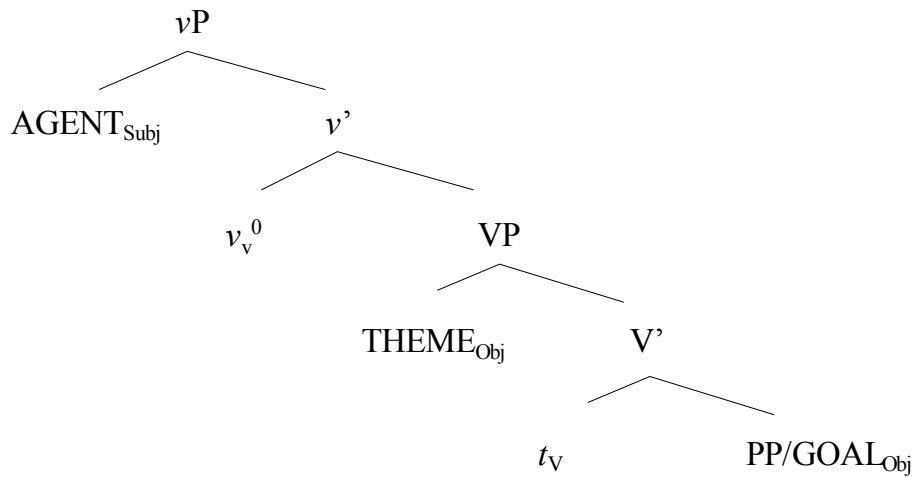
Here, vP is a perfect projection of v^0 and an extended projection of the bottom V^0, just as any higher FP is an extended projection of V^0. At the same time, since V^0 in fact substitutes into, and as such lexicalizes v, therefore, v_v^0 ultimately is a lexical head. Thus, vP is a perfect *lexical* projection of v^0.

While (3) shows the official structure we want to assume, for most parts of this thesis, we will simplify and write instead of (3): $[_{vP}$ Subject $[_{v'}$ v^0 Object$]]$. That is, we interpret the object as the direct complement of v^0, and ignore that, zooming in on vP, the object is in fact contained in VP, VP being the de facto complement of v^0.

Lastly, on the topic of syntactic linking, the theta-hierarchy suggested in (3) is the one assumed by Baker 2003:79, and is adopted here as a working hypothesis. That is, it is imperative that the syntactic linking of arguments obeys a thematic hierarchy (cf. Larson 1988). However, we want to be somewhat lenient with respect to both the exact positioning of particular arguments, and the language- specific hierarchy between, particularly, object-2-roles. That is, for now, we can assume that the AGENT-subject argument is always base generated in Spec, vP, following the 'subject-in-VP'-hypothesis (cf. Zagona 1982, Koruda 1988, Koopman & Sportiche

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[3]For the discussion of intransitive (unergative and unaccusative) verbs, see section 5.3.

1991), but we will come back to this point in chapter 3. Furthermore, with respect to the hierarchy between THEME and GOAL, I leave it open whether particular grammars alternatively allow for a 'GOAL > THEME' hierarchy.[4]

Altogether, the theory of Extended Projections and binary X-bar-Theory, as well as the assumptions on syntactic linking, all this restricts the organization of phrases purely hierarchically. Neither one says anything about how sister nodes and their corresponding terminals should be mapped onto a linear order. How, then, does a language decide on a particular ordering of two sister nodes? My answer is by constraint ranking. Let us turn to the next section, in which we will define and briefly discuss all the relevant constraints at stake.

2.2   Determining linear order

Once more, we start by following Grimshaw 1997 in her assumption that a general preference towards the linear order of head and complement in any given XP of a language is determined by the relative ranking of HEAD LEFT and HEAD RIGHT.

2.2.1   HEAD LEFT and HEAD RIGHT

The two head alignment constraints are category-neutral. This means that once a language has ranked the pair, it either favors a [head - complement]-order across the board, obtained by the ranking HEAD LEFT >> HEAD RIGHT, or a [complement - head]-order, via the ranking HEAD RIGHT >> HEAD LEFT. The preference holds for any XP, regardless of its category.

The definitions of HEAD LEFT and HEAD RIGHT are given in (4) and (5). Note that they differ from the ones originally proposed by Grimshaw 1997:374, 407. An assumption of the original versions would lead to a slightly different overall typology (see below, section 2.5).[5]

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[4]This acknowledges in particular the situation in German, for which there is a considerable debate as to whether the THEME is always linked above the GOAL (cf. Müller 1995, 1999:779), or whether, for most verbs, in accordance with the unmarked surface order (cf. Lenerz 1977), the THEME is below the GOAL (cf. Büring 1992, 1996:3f). See also Haider & Rosengren 1998:14f for the articulated view that the syntactic argument linking varies with the choice of the verb. See more on German dative arguments in section 5.3.

[5]See as well Grimshaw 2001a:2, 3, for a more recent proposal of yet other definitions of general alignment

(4)   HEAD LEFT:=

   • categories X^0:) ″ mother node *y* such that the right edge of X^0 and the right edge of *y* coincide.

(5)   HEAD RIGHT:=

   • categories X^0:) ″ mother node *y* such that the left edge of X^0 and the left edge of *y* coincide.

> **Mother node** $=_{def}$ immediately dominating node
>
> **On evaluation**: HEAD LEFT is violated for every head such that there exists at least one mother node and the head aligns at the right edge of this mother node. HEAD RIGHT is violated for every head such that there exists at least one mother node and the head aligns at the left edge of this mother node.
>
> Both HEAD LEFT and HEAD RIGHT are evaluated on *all* syntactic heads, including abstract heads and head copies (= traces). Likewise, an intervening complement can rescue a head alignment violation even if the complement is a copy of a moved complement (i.e., a trace).

The definitions in (4) and (5) are negative: HEAD LEFT and HEAD RIGHT cause left- vs. right-orientation by penalizing a configuration in which a head aligns with the *opposite* side of its mother node. For example, in order to obey HEAD LEFT, a head must *not* align at the right edge of any mother node. This can only be accomplished if X^0 has a complement on its right side and thus aligns to the left of the complement, coinciding with the left edge of its X'-mother-node. Obviously, that same configuration violates HEAD RIGHT, which can only be satisfied by the reverse linear order. However, aligning the head right of the complement, hence, at the right

---

constraints. Furthermore compare the distinct definitions and axiomatic assumptions in Vikner 2001:143-145.

Vikner 2001, in addition, proposes an alternative Optimality theoretic way to extend the set of alignment constraints, in order to account for the mixed directionality of the Germanic SOV-languages (see here also footnote 9 below). On the typological differences between Vikner's and the current proposal, see section 2.6 (and also 3.7).

edge of the X'-mother-node, causes again violation of HEAD LEFT:[6]

(6)   Violating HEAD LEFT or HEAD RIGHT:

	HEAD LEFT	HEAD RIGHT
a. $[_{XP} [_{X'} X^0 YP]]$		*
b. $[_{XP} [_{X'} YP X^0]]$	*	
c. $[_{XP} [_{X'} X^0]]$	*	*

Note in (6) that a candidate like (c), a projection which contains no complement such that the head aligns with both sides of X', is, under the negative definition of HEAD LEFT/RIGHT, in fact worse than both a [head - complement]- and a [complement - head]-configuration. In consequence, we get a certain 'obligatory complement'-effect coming along with the presence of a head. When considering any syntactic head, it is in general more harmonic to add a complement to this head than to have a non-branching structure. Obviously, if the input doesn't provide any other phrase that qualifies as a possible complement, we have to live without it. But if another phrase is available, linking it into complement position is better for head alignment than linking it, for example, into specifier position, or adjoining it. Therefore, with respect to the head, the complement position becomes 'the least marked' one; filling of specifier- or adjunct-positions will only be considered *if* the complement position is already filled, or if some other (higher ranked) constraint (or axiom) forces linking into another position first.[7]

Thinking in terms of thematic linking (recall (3)), this also implies the following with respect to the base VP. If there is no independent restriction that V must to link its THEME into

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[6]The negative conception of HEAD LEFT and HEAD RIGHT as in (4) and (5) turns them into categorical markedness constraints. That is, violation is not gradient: HEAD LEFT/RIGHT is violated once and for all for a given head, as soon as there exists one mother node such that the barred alignment holds. On the notion of gradient violation as opposed to categorical, see Prince & Smolensky 1993:29.

[7]Compare here also Chomsky 1995:345ff for a parallel result in a minimalist framework (there, the complement is merged first to the head, before any specifier).

its specifier, then in absence of a PP (or a GOAL), then the dynamics of HEAD LEFT/RIGHT will cause the THEME-argument to be base generated in the complement of V^0.[8]

Finally, I remind the reader that the current definitions rely on the axiomatic assumption made under 2.1, (1.iii.), namely that syntactic structure must be binary. Consequently, it is impossible for a head to obey both HEAD LEFT and HEAD RIGHT at the same time. As soon as a head is present in the syntactic structure, it has to align with at least one side of its mother node, thus, violating at least either HEAD LEFT or HEAD RIGHT. Furthermore, keep in mind that nothing in HEAD LEFT nor HEAD RIGHT tells us anything about the directionality of other phrases in the projection if they are positioned outside the constituent consisting of a head and its complement.

2.2.2   LEX HEAD EDGE

Given just HEAD LEFT and HEAD RIGHT, then, the expectation is that a language makes a uniform decision on how it orders head and complement: it either has only [head - complement]-configurations, by HEAD LEFT >> HEAD RIGHT, or only [complement - head], by HEAD RIGHT >> HEAD LEFT. What factors, then, can lead to deviation from these general preferences? The first complicating factor is LEXICAL HEAD EDGE:[9]

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[8]From there, the object might certainly move to Spec, VP, as we introduce below a constraint which imposes the need of a specifier in any verbal projection. This does not concern us at this point, but it is relevant in the analysis of unaccusatives. See section 5.3.

[9]For phonological constraints on 'edges', see, for example, Bickmore 1999:128 who proposes ALIGN(H, E, S, E). The constraint aligns an edge of an output High Tone Span with an edge of the stem. Similar to LEX HEAD EDGE, ALIGN (H, E, S, E) is satisfied when a High Tone Span is aligned to either edge of the stem. See also the phonological EDGE-ANCHOR$_{BR}$ constraint proposed by Nelson 1999, 2003. Furthermore, see morpho-syntactic edge constraints in Anderson 1996, 2000, Legendre 1996, 2001.

Vikner 2001 proposes a PREDICATE RIGHT constraint which shares some of the effects imposed by LEX HEAD EDGE; for a comparison, see section 2.6 below.

(7)　LEX(ICAL) HEAD EDGE:=

　　• pronounced positions " ^{0} of a lexical category " :

　　" LexP, LexP is a perfect projection of a lexical head Lex^0, such that an edge of " and an
　　edge of LexP coincide.

> **On evaluation**: LEX HEAD EDGE is a 'positive' categorical constraint. It is violated once and for all for every
> pronounced position of a lexical head that does not coincide with an edge of some perfect lexical maximal
> projection. Proper edge alignment can be blocked by any syntactic terminal, including abstract elements such as
> copies (= traces).
> **Lexical heads/categories**: {verb, noun, adjective}; cf. Baker 2003

LEXICAL HEAD EDGE introduces a special harmony burden on lexical heads. In order to obey LEX HEAD EDGE, a lexical head should not only be pronounced within a lexical projection, that is, within a perfect projection of a lexical head, but furthermore, it should align at an edge of the perfect LexP. Two aspects are relevant to note.

　　First, LEX HEAD EDGE is about pronounced positions. Thus, if a lexical head moves, the abstract copy is not evaluated on its edge status, only the head of the chain is. Hence, one might immediately recognize that moving a lexical head could be a strategy to accomplish proper edge alignment. We have to keep in mind, though, that, when looking at the surrounding context, a copy/trace, like any other syntactic terminal, can still hinder a lexical head from being at the edge. Furthermore, movement into a higher functional projection will not help under any circumstances. On the contrary, it will cause a violation of LEX HEAD EDGE which is independent of directionality, simply because the lexical head won't find any perfect lexical projection for alignment to begin with (only an extended functional one).

　　However, a lexical head can move within the lexical layer of its *ep* without losing the chance of LEX HEAD EDGE satisfaction. For example, the substitution of V^0 into v^0 yields a lexical head $v_v{}^0$, whose perfect maximal projection is vP. Thus, if the verb surfaces at the edge of lexical vP, this satisfies LEX HEAD EDGE. As a matter of fact, lexicalized v is itself a lexical category and as such input for LEX HEAD EDGE. Similarly, the extension of the lexical layer by creation of an additional VP- or vP-shell does not destroy the possibility of LEX HEAD EDGE obedience. Altogether, as long as a lexical head is within *some* lexical shell on the surface, the

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potential to satisfy LEX HEAD EDGE exists. Ultimate success depends on directionality. In FP, the same potential does not exist, and hence, LEX HEAD EDGE is categorically unable to have any directionality impact on a functional projection.

Second, besides being more restricted than HEAD LEFT and HEAD RIGHT regarding its domain of application (HEAD LEFT/RIGHT quantify over all heads, including lexical, functional and the copies/traces thereof), LEX HEAD EDGE is also more general with respect to directionality. LEX HEAD EDGE demands alignment at an unspecified edge of a perfect maximal projection. Consequently, alignment at either the left edge or the right edge of LexP is equally able to satisfy it.

Let us have a closer look at the impact of LEX HEAD EDGE on a lexical head inside a perfect lexical projection. Take a structure where $\Sigma = v_v$, LexP = vP. First of all, in a vP which contains nothing but the lexical head v^0 and its complement, LEX HEAD EDGE can be satisfied by both $[_{vP} [_{v'} v^0$ complement$]]$ and $[_{vP} [_{v'}$ complement $v^0]]$. The lexical head does not only align with an edge of its immediate mother node v' but also with an edge of vP.

But what happens if the lexical head has a specifier as well as a complement? Looking at vP, we precisely expect the subject to be base-generated in Spec, vP. Now, Spec, vP is not a daughter of v' but, by definition, is a daughter of vP. Since LEX HEAD EDGE requires alignment at a LexP-node, the specifier is a potential threat. To see this, consider (8), which shows all four logical possibilities of aligning v^0, its complement and its specifier in vP. Two of the possibilities do not violate LEX HEAD EDGE, the other two do:

(8)   **a. [spec [complement - head]]**   **b. [spec [head - complement]]**
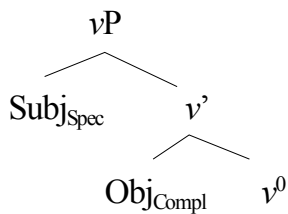
       violation of HEAD LEFT   violation of HEAD RIGHT and LEX HEAD EDGE

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c. **[[complement - head] spec]**

vP
      / \
v'   Subj$_{Spec}$
/ \
Obj$_{Compl}$ v^0
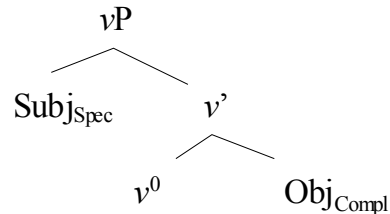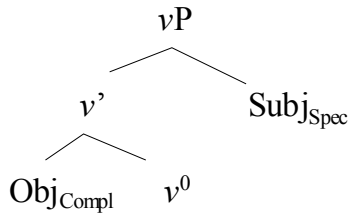
violation of HEAD LEFT and LEX HEAD EDGE

d. **[[head - complement] spec]**

vP
      / \
v'   Subj$_{Spec}$
/ \
v^0 Obj$_{Compl}$
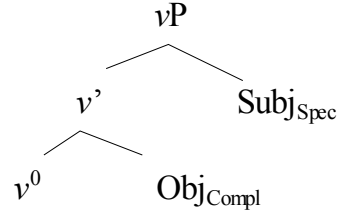
violation of HEAD RIGHT

(8a) and (8c) both align the head to the right of its complement, and therefore violate HEAD LEFT but not HEAD RIGHT. But only (a) aligns the specifier to the left of v' and as such avoids violation of LEX HEAD EDGE, as the head aligns with the edge of vP

We see the reverse situation in (8b) and (8d). Both (8b) and (8d) align the head to the left of its complement, thus violating HEAD RIGHT and satisfying HEAD LEFT. But only (d) does not violate LEX HEAD EDGE, because it aligns the specifier right-peripherally such that v^0 aligns with an edge of vP (this time the left edge). We see that, because of LEX HEAD EDGE, the head-peripheral XPs do better than the head-medial XPs when LEX HEAD EDGE enters the set of constraints.

Let us pause here for a second and think of the possible interactions of LEX HEAD EDGE and HEAD LEFT, HEAD RIGHT, and the relevance of specifiers therein. Hypothetically, if the directionality of specifiers was free, then accepting LEX HEAD EDGE as a relevant factor, we would expect that a language with the HEAD LEFT >> HEAD RIGHT-ranking aligns a lexical specifier right-peripherally, and a language with HEAD RIGHT >> HEAD LEFT-ranking chooses left-peripheral specifier alignment. The result is two head-peripheral lexical XPs, each one obeying both the higher ranked constraint of the pair HEAD LEFT/RIGHT and LEX HEAD EDGE. But the reasoning is still incomplete, despite the possibility that it might ultimately prove itself correct for a subset of languages (as I will claim below). Considering the high percentage of both uniform 'S - O - V' and '*S* - V - O'-word orders among the world's languages, it seems that natural languages prefer *left*-peripheral specifiers. Or, to put it in more general terms, languages tend to prefer left-peripheral alignment of elements that are hierarchically higher than others. In fact, this general tendency is even visible in mixed word order cases such as those mentioned

above. Accounting for this tendency, is a crucial job for the system to accomplish.

Before settling on an actual constraint that implements this 'anti-symmetry', we must recognize that a special request for left-peripheral specifiers does not conflict with the demands of LEX HEAD EDGE in languages with HEAD RIGHT >> HEAD LEFT-ranking. Such languages prefer complement *and* specifier on the left of the head anyway, in order to achieve proper edge alignment along with obedience to (the higher ranked) HEAD RIGHT.

However, in a HEAD LEFT >> HEAD RIGHT language, the specifier becomes a threat. If the specifier prefers to align left-peripherally but at the same time the head is to the left of its complement, then the result, a head-medial lexical XP, violates LEX HEAD EDGE. Assume for a moment that it is most important to obey LEX HEAD EDGE. (I will claim that this is the case in head-initial grammars with a particular kind of mixed word order, although not in ordinary SVO-languages). Under a ranking HEAD LEFT >> HEAD RIGHT, we have three structural ways of resolving the conflict. Take again *v*P as our lexical XP:

(A) We can ignore the preference for left-peripheral specifiers and choose right-peripheral alignment of them instead. That results in $[_{vP} [_{v'} v^0$ complement] spec]- order. This way, we obey LEX HEAD EDGE, and we maintain the [head - complement]-order preferred by HEAD LEFT >> HEAD RIGHT. Call this the **'right-peripheral specifier'-choice**.
With the object in complement position, and the subject in the specifier, then, if the subject ultimately stays inside the lexical layer, the 'right-peripheral specifier'-choice yields a 'verb - object - subject'-order, in short **VOS**.

(B) We can extend the lexical domain, by moving the head out of a [spec [head - comp]]-configuration and creating an additional VP-shell that does not have a specifier, resulting in $[_{vP} [_{v'} v^0 [_{vP}$ spec $[_{v'} t_V$ complement]]]]. The lexical head can then surface at the left edge of this higher lexical projection and the lower *v*P can be a head-medial XP with a left-peripheral specifier, thereby avoiding violation of LEX HEAD EDGE. Call this the **'head movement'-choice**.
With the object in complement position, and the subject in the specifier, then, if the subject ultimately stays in situ as well, the 'head movement'-choice yields a 'verb - subject - object'-order, in short **VSO**.

(C)   We can ignore the preference for [head - complement] and choose
        [$_{vP}$ spec [$_{v'}$ complement v^0]] instead. Then, we can align the specifier left-peripherally and
        still obey LEX HEAD EDGE. Call this the **'right-peripheral head'-choice**.
        With the object in complement position, and the subject in the specifier, then if the verb
        indeed does not leave the lexical layer, the 'right-peripheral head'-choice yields a
        'subject - object - verb'-order, in short **SOV**.

Only the 'right-peripheral head'-choice in (C) violates HEAD LEFT, in a language which
elsewhere obeys HEAD LEFT. But what do (A) and (B) violate that makes them non-optimal in
some languages? Let us now introduce two further constraints, one which is violated in the
'right-peripheral head' choice, the other in the 'head movement'-choice. We will then have all
the tools together in order to derive (A), (B) and (C) as three choices that create three *mixed*
word order types. The claim is that (A) gives us the structural key to analyze VOS-languages
such as the Mayan ones (see section 2.3), (B) does so for (strict) VSO-languages such as the
Mixtecan (see 2.4), and (C) does so for 'underlying' SOV-grammars such as the Germanic OV-
languages, and Persian (see 2.5). Significantly, the overall approach not only reveals how three
mixed patterns are anything but arbitrary in their ways of being a non-uniform grammar, it also
ties the three mixed cases together as being driven by the same cause: the affinity of lexical
heads to surface at their local phrase edges.

2.2.3   BRANCHING RIGHT
Let us first address 'anti-symmetry'. In (10) below, I present the definition of a constraint
BRANCHING RIGHT which is inspired by the conception of the LCA, and which draws heavily on
the Branching Constraint (BC), as proposed by Haider 1993, 1997a, 2000:47. The choice of
identifying a slightly different cause for anti-symmetry is driven by the internal logic of the
system. Only the current formulation of BRANCHING RIGHT (or better, any functionally
equivalent formulation yielding the same violation profile) gives the factorial typology that
comprises exactly those mixed and uniform types I claim to be empirically desirable.
Specifically, the internal logic of the system demands an 'anti-symmetry'-constraint which
targets in particular the directionality of specifiers and adjuncts, but, at the same time, gives

potential freedom to the linear order of head and complement.[10]

Therefore, we must think, on a purely structural level, what a specifier and a phrasal adjunct might have in common that is distinct to a complement. All three constitute phrases, and as phrases, they are equal with respect to their internal make up: they are projections that dominate other syntactic nodes. The separation between specifiers and adjuncts on the one hand and complements on the other concerns their local syntactic context. A specifier is, in terms of structural X'-hierarchy, a 'higher-order'-entity in the sense that the specifier's sister node dominates other syntactic nodes as well. That is, the sister node is a *projection* (X'). The same holds for a phrasal adjunct. Here, the sister node is also a projection, XP (or X'). But the sister of a complement is *not* a projection, it is a head.

Now, syntactic branching is about an either left- or right- oriented alignment of a mother and a sister node. Therefore, if it is about acknowledging that 'higher-order'-entities have a preference for being attached at the *left*-periphery, then we have to recognize a general restriction on *right*-branching that targets the triple of two sister nodes, each one dominating other syntactic nodes, and their mother node in the following way. The restriction is that the right edge of the mother node has to align with the right edge of the one sister that *shares* the same head with the mother node. Take for illustration once more the specifier:[11]

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[10]In this way, the set of structures that pass on BRANCHING RIGHT overlaps more closely with that allowed by the BC (in part, BRANCHING RIGHT is just a more explicit formulation of what the BC says). But there is the non-trivial difference that the BC acknowledges only right-peripheral lexical *root* heads, and neither right-peripheral *extended functional* heads nor right-peripheral *extended* lexical heads (cf. Haider 2000:48). Therefore, the BC does not allow any SOV-language to correspond to a structure involving Larsonian shells, or a *v*P-layer (see Haider 2000:49f who makes precisely a distinction between a VP-shell structure being present in SVO-grammars but not in SOV). Likewise, the BC is incompatible with the possibility of a uniform SOV-language having, for example, a right-peripheral T-head with movement into it. Overall, we have to keep in mind that neither the BC nor the LCA is a *violable* constraint, as BRANCHING RIGHT is.

A violable constraint that allows exactly the same set of structures as the BC is SPINE-RIGHT, proposed by Sells 2001:114ff. See here the discussion on Morimoto 2002 in section 2.8 below. Morimoto builds on Sells' system, and the concerns pointed out in 2.8 apply to both approaches.

[11]I assume that X'-, or XP-nodes never count as heads themselves; only X^0 is a head. See section 6.1 for

29

(9)
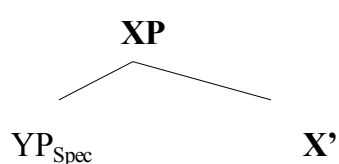
XP   ← mother node: **the head of XP is X^0**

YP$_{Spec}$ X'   ← **sister nodes**, each one a **projection**:

the head of YP is Y^0 ; **the head of X' is X^0**

°   Right-alignment of nodes that **share heads**

In the triple of nodes (i) Spec, XP (= YP), (ii) its sister X' and (iii) the mother XP, X' and XP share the same head, but XP and YP do not. If the right edge of XP and the right of X' align, then the specifier ends up in a left-peripheral position. Abstracting away from particular nodes, the logic of this 'branching rightwards' which targets triples of nodes, each one of them dominating further nodes, defines BRANCHING RIGHT:

(10)   BRANCHING RIGHT:=

• sister nodes *x*, *y* such that neither *x* nor *y* is a syntactic terminal, *x* and *y*'s mother node *z* and *x* are both projections of the same head *w^0*:

the right edge of *x* and the right edge of *z* must coincide.

'Syntactic terminal' is understood as a node that does not dominate anything other than the actual phonological terminal. Thus, given X-bar-theory, all syntactic terminals are X^0-categories.

The effect of BRANCHING RIGHT then is as follows. First, BRANCHING RIGHT can only come into play if we are looking at two sister nodes that are both hierarchically high enough. This means that they *both* have to dominate more than just a phonological terminal (we are quantifying over two sister nodes, where neither one is a syntactic terminal). Consequently, BRANCHING RIGHT does not say anything about the linear order of a simple head and its

discussion.

complement: neither a [head - complement] nor a [complement - head]-configuration violates BRANCHING RIGHT.[12]

The same does not hold for sister nodes such that one is a specifier, or an adjunct. For a concrete illustration, compare the two tree structures of (11a) and (11b):

(11)   a. No violation of BRANCHING RIGHT: b. Two violations of BRANCHING RIGHT:
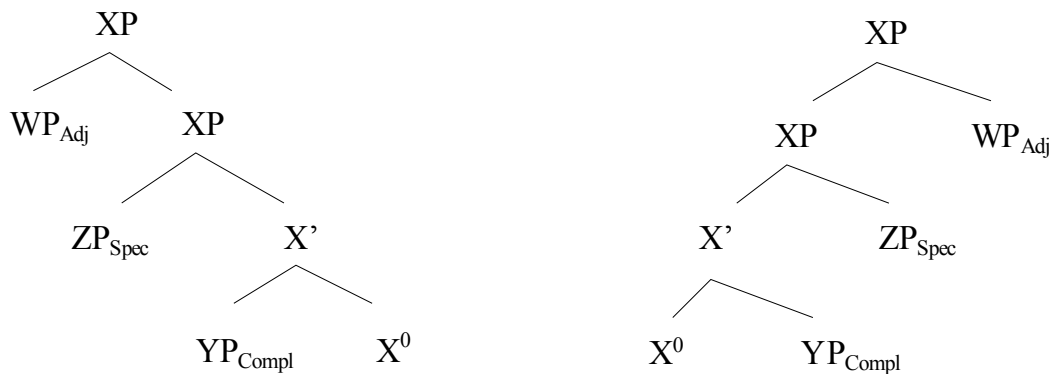
In both trees, the two XP-nodes and the X-bar-node are all projections of the same head X^0. Their corresponding sisters WP and ZP, however, do not share their heads with their corresponding mothers. Take first the adjunct WP, which is a sister of the lower XP-segment in both (11a) and (11b). Both WP and the lower XP-segment are projections, thus neither is a syntactic terminal; the mother is the higher XP-segment. Now, this mother and the lower XP-segment are both projections of the same head X^0. WP does not share its head with the mother XP; still, WP is not a syntactic terminal. Therefore, in order to obey BRANCHING RIGHT, the right edges of the two XP-segments must coincide, such that WP ends up in a left-peripheral position. But this only holds in (a). Hence, the linear order of the adjunct and the lower XP-segment obeys BRANCHING RIGHT in (11a) but violates it in (11b).

In parallel, ZP, the specifier of XP in both (a) and (b), is a sister of X'. Neither X' nor ZP is a syntactic terminal, and X' shares its head X^0 with the mother node XP, while ZP does not.

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[12]It will be crucial later on that the same is not necessarily true for all *complex* heads. See chapter 6.

Hence, BRANCHING RIGHT demands right alignment of X' and XP, which is only satisfied in (11a). (11b), on the other hand, once more violates BRANCHING RIGHT, this time with respect to the linear order of the specifier and its X'-sister node.

Finally, in both (a) and (b), one of the sister nodes YP and X^0 *is* a syntactic terminal, namely X^0. Therefore, even if YP and the mother node X' are projections of the same head, BRANCHING RIGHT does not apply. (YP and X' are projections of the same head if XP and YP are in fact projections within a larger extended projection. Take, for example, YP = vP, XP = TP. Then vP and TP are both extended projections, and thus projections, of the base head V).[13]

Altogether, we see that BRANCHING RIGHT penalizes both right-peripheral specifiers and adjuncts, favoring a left-peripheral orientation. This prohibition is independent of the ranking of HEAD LEFT and HEAD RIGHT, and indifferent towards the category we are looking at.

Finally, notice that in proposing BRANCHING RIGHT, I furthermore make the claim that a 'mirror'-constraint BRANCHING LEFT does *not* exist. This might come as a surprise and we could ask ourselves why there isn't a symmetric pair just as there is a symmetric pair of HEAD LEFT and HEAD RIGHT. However, keep in mind that the assumption that alignment constraints always come in symmetric pairs is ultimately a stipulation, with no more inherent validity than my claim that there is no 'BRANCHING LEFT'. We could try to hide this stipulation by formulating a slightly different definition of BRANCHING RIGHT, which talks about which sister node must precede or follow in certain structural contexts. But the stipulation wouldn't really be taken away, since we could still ask us why there isn't a 'mirror'-constraint which requires a particular sister node to 'follow' instead of 'precede'. Notice also that this stipulation carries over to any 'anti-symmetry'-principle, like the Branching Constraint ("Projection-internal branching nodes on the (extended) projection line *follow* their sister-nodes"; cf. Haider 2000:47) and the LCA ("If a

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[13]A last remark: 'Under normal circumstances', whenever we find two sister nodes such that both are projections, one of the two sisters *shares* its head with the mutual mother, but the other does *not*. The only exception could be a projection of the form $[_{XP} [_{X'} X^0][_{X'} X^0]]$, which is 'co-projected' by two heads, an option we hypothetically admitted for GEN in footnote 1. Note that such a structure violates BRANCHING RIGHT for the left X'-node. In order to fully satisfy BRANCHING RIGHT, both X'-nodes should align at the right edge of the mother node XP, because both share a head with XP and both have a sister which is not a syntactic terminal.

node " asymmetrically c-commands a node $, then " must *precede* $.”), where we could ask why the definition says explicitly 'follow' or 'precede' and not the contrary.[14]

In the greater scheme, I see the proposal of the set of constraints {BRANCHING RIGHT, HEAD LEFT, HEAD RIGHT} as a response to the *empirical* asymmetry that, I claim, can be observed in natural languages in some quarters of syntactic structure but not in others (see also Haider 2000:64 for a similar point of view). If syntactic structure is indeed partly but not entirely symmetric, then the explanatory system should reflect this openly rather than idealizing it away.

Now that we have a formulation of BRANCHING RIGHT, let us go back to the discussion which started its introduction. Then, we were looking for two factors, one that can bar the configuration introduced in (A) above, $[_{vP} [_{v'} v^0$ complement] spec], the other that can block $[_{vP} [_{v'} v^0 [_{vP}$ spec $[_{v'} t_V$ complement]]]], introduced in (B). Both were discussed as possible choices to satisfy LEX HEAD EDGE without violating HEAD LEFT at the same time. Obviously, it is BRANCHING RIGHT which penalizes the first configuration, that is, the 'right-peripheral specifier'-choice.

Keep in mind that BRANCHING RIGHT not only penalizes right-peripheral verbal or lexical specifiers, but, more generally, any right-peripheral specifier and any right-peripheral adjunct.

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[14]Kayne 1994:36-37 claims that the LCA's choice of mapping asymmetric c-command onto *precedence* rather than a successor-relation is *not* a stipulation. A crucial part of the argument is the association of a string of terminals with a string of time slots, and the pairing of each time slot with the substring of terminals produced up to that time. With a substring of terminals 'abcdz' so mapped onto a set of substrings 'a, ab, abc, abcd, abcdz', it is crucially only *a* which precedes every terminal in every substring, whereas *z* does not follow every terminal in every substring.

Notice however that this part of the argument rests on the *perspective onto the terminals* produced up to a particular time slot. Alternatively, we could decide to pair a time slot with the substring of terminals produced up to this time, but looking backwards, thus ordering always the *most recent* terminal first, in which case the mapping becomes 'a, ba, cba, dcba, zdcba'. *a* now follows every terminal in every substring, whereas *z* does not precede every terminal in every substring.

We could also not defend the priority of 'precede' nor 'follow' by relating it to time if we simply chose a *direct* mapping of terminals onto the time slot of production: here, we would get 'abcdz' in which case *a* would precede *and z* would follow all other terminals. Therefore, I think that any judgement on the priority of 'left' or 'right', 'precede' or 'follow', or on the apparent 'asymmetry of time' (Kayne 1994:38) ultimately depends on the initial stipulations we make

However, it is the *lexical specifier* which can become a particular threat for obedience of LEX HEAD EDGE. Hence, we can already foresee that a language which ends up violating BRANCHING RIGHT in order to succeed on LEX HEAD EDGE *must* come out as a mixed word order type, which accepts a lexical specifier but not necessarily any other specifier or any adjunct to follow a sister node. As we will see below, this is precisely what we observe in the case of Mayan VOS.

In order to discuss the complete picture, we still have to ask what exactly the (B)-configuration, $[_{vP} [_{v'} v^0 [_{vP} \text{spec} [_{v'} t_V \text{complement}]]]]$ violates. We just learned that the 'right-peripheral specifier'-choice (A) violates BRANCHING RIGHT (while neither (B) nor (C) does so), and we already know that the 'right-peripheral head'-choice (C) violates HEAD LEFT (and neither (A) nor (B) does). But, then, is there anything less harmonic in the 'head movement'-choice, compared with the two alternatives?

2.2.4 GENERALIZED SUBJECT

First of all, if all three configurations are possible conflict resolutions, that is, if there is typological variation between (A), (B) and (C), then, the fact that $[_{vP} [_{v'} v^0 [_{vP} \text{spec} [_{v'} t_V \text{complement}]]]]$ incurs more HEAD RIGHT violations than both opponents is not strong enough. (12) below compares all three structures on the basis of the constraints introduced so far. Keep in mind that we are talking about different choices that obey LEX HEAD EDGE in a HEAD LEFT >> HEAD RIGHT -languages. (The table does not show this, in order to reflect that we are only comparing violation profiles.):

(12)   Candidate (c) could not win:

	LEX HEAD EDGE	BRANCH RIGHT	HEAD LEFT	HEAD RIGHT
a. $[_{vP} [_{v'} v^0 \text{complement}] \text{spec}]$		*		*
b. $[_{vP} [_{v'} v^0 [_{vP} \text{spec} [_{v'} t_V \text{complement}]]]]$				**
c. $[_{vP} \text{spec} [_{v'} \text{complement} v^0]]$			*	

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in order to defend this judgment.

We see that, while the 'right-peripheral specifier'-candidate (a) violates BRANCHING RIGHT once and HEAD RIGHT once, the 'head movement'-candidate (b) violates HEAD RIGHT twice (one violation for the copy/trace of *v* in the lower *v*P, one for the pronounced position in the higher *v*P), and the 'right-peripheral head'-candidate (c) violates HEAD LEFT once.

Now, in a grammar with the ranking HEAD LEFT >> **HEAD RIGHT** >> **BRANCHING RIGHT**, the 'right-peripheral specifier'-choice (a) would be the optimal resolution of avoiding a LEX HEAD EDGE-violation in *v*P. On the other hand, ranking **BRANCHING RIGHT**, HEAD LEFT >> **HEAD RIGHT**, a language would choose the 'head movement'-candidate (b). But the 'right-peripheral head'-candidate (c) could never win against the 'head movement'-choice, unless we re-rank HEAD RIGHT and HEAD LEFT. But this would yield a grammar that prefers [complement - head]-configurations everywhere, not only in *v*P.

Is there anything else that marks the 'head movement'-choice as less harmonic? Notice that candidate (b) does not project a specifier in the higher *v*P. Grimshaw 2001a:3 proposes a constraint OBLIGATORY SPEC, which demands that every projection must have a specifier. OBLIGATORY SPEC reflects the idea of generalizing another constraint, SUBJECT. SUBJECT was proposed by Grimshaw 1997:390 as an Optimality-theoretic variant of the EPP ('Extended Projection Principle'; cf. Chomsky 1981), both of which force one specific specifier to be filled, namely one within clauses. (13) proposes a GENERALIZED SUBJECT constraint, which falls somewhere between OBLIGATORY SPEC and SUBJECT and ties the relevant aspects of both the EPP and the 'VP-internal-subject'-hypothesis (cf. Zagona 1982, Kuroda 1988, Koopman & Sportiche 1991) into one constraint. GENERALIZED SUBJECT requests that *every clausal* projection must have a specifier:

(13) GENERALIZED SUBJECT:=

     ∀ XP, XP is a projection of a head which projects a clause: ∃ Spec, XP.

     Clause:=_{def} Extended Projection projected by α, α ∈ {V, Pred}.

     In an extended projection, every (functional and lexical) projection is a(n extended) projection of the projecting root head. Then, GENERALIZED SUBJECT is violated once for every XP in *ep* of α that has no specifier.[15]

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[15]See section 5.1 for the explanatory background of why, exclusively, an *ep* projected by either a verb or a Pred-

GENERALIZED SUBJECT incorporates both an empirical and a conceptual claim. On the empirical side, in order to capture more accurately the mixed and uniform types at stake, an empirical difference between verbal and nominal extended projections must be included in the constraint system. This concerns in particular the 'mixed SOV'-pattern instantiated in grammars like German, which, as we will see below, projects a head-final VP/*v*P but a head-initial NP.

The conceptual claim is that one key factor involved in the puzzle of why a grammar's directionality can differ in VP and NP is the necessity vs. optionality of projecting a specifier and, as such, creating a (potential) 'subject'. The *urge* to have a subject is present in the verbal domain but not in the nominal domain. Why? Verbs but not nouns are 'clause feeders', in the sense that only verbs provide the lexical base for a clause. It is this clause which is in crucial demand of a subject, given that a clause constitutes the predication of a subject. Nouns and their extended projections do not face that same demand. GENERALIZED SUBJECT, then, instantiates the general requirement to create potential subjects in clausal extended projections, while remaining mute in any other context.

GENERALIZED SUBJECT is fairly abstract in its definition of 'subject'. That is, the constraint is not about demanding a nominative case-marked subject or an argument with a specific subject-2-role. Rather, GENERALIZED SUBJECT is about creating *syntactic positions* – i.e. specifiers –, which can become, or provide grammatical subjects. It is precisely because of this structural abstractness that GEN SUBJECT is able to have a general impact on directionality.

Let us return to our triplet of choices to obey LEX HEAD EDGE in a HEAD LEFT >> HEAD RIGHT -grammar to see what GENERALIZED SUBJECT has to say about these configurations. Needless to say, GENERALIZED SUBJECT is violated in the 'head movement'-configuration, but not in the 'right-peripheral specifier'- nor in the 'right-peripheral head'-candidate. Furthermore, we should keep the following in mind. The 'head movement'-choice, which now becomes, in clauses, the product of violating GENERALIZED SUBJECT in order to obey LEX HEAD EDGE, is solely a matter of VP-structure. It does not concern the functional projections of a clause; here,

---

head constitutes a clause (category of Pred, cf. Bowers 1993, 2001, Baker 2003). For now, we can simply take for granted that all verbal extended projections constitute clauses. Thus, each projection in a verbal extended projection must have a specifier, or else GEN SUBJECT is violated.

the existence of a specifier does better on GENERALIZED SUBJECT without harming LEX HEAD EDGE. Therefore, if nothing else is said (see more on this point in chapter 3), then a clausal functional head that has a specifier is more harmonic than a functional head that has none, and consequently, clausal functional heads become the preferred targets for specifier movement/filling. Importantly, this even holds in a language which is willing to violate GENERALIZED SUBJECT for LEX HEAD EDGE. As a matter of fact, the claim to be brought forward below is that the VSO Mixtecan languages allow for a configuration [$_{FP}$ spec [$_{F'}$ F^0 comp]], without any need of moving out the functional head (see section 2.4).

Finally, as suggested above, we have to watch out for possible differences in directionality, between VP on the one hand and non-clausal lexical projections on the other. Since GENERALIZED SUBJECT exclusively refers to clauses, the 'head movement'-choice won't violate GENERALIZED SUBJECT in a non-clausal domain. This means that we cannot expect the 'right-peripheral head'-choice to win in such a non-clausal context (recall table (12)). Rather, we should expect that HEAD LEFT >> HEAD RIGHT -languages, which decide on the 'right-peripheral head'-configuration as their best conflict resolution, nevertheless switch to the 'head movement'-choice in all contexts in which GENERALIZED SUBJECT is mute. This will be the essential key to understand the non-uniform word order of grammars such as German and Persian, which seem to be curiously 'idiosyncratic' by singling out primarily VP/*v*P as the exception of [head - complement] ordering.

Altogether, adding GENERALIZED SUBJECT to the set of constraints, such that we get {HEAD LEFT, HEAD RIGHT, LEX HEAD EDGE, BRANCHING RIGHT, GEN SUBJECT}, we are ready to predict a typology which comprises uniform phrase structure types with a restricted set of non-uniform cases. The following sections, 2.3 to 2.6, will present this typology.

The sections 2.3 to 2.5 discuss the predicted mixed word order types, which are mixed because they implement either the 'right-peripheral specifier'-, the 'head movement'- or the 'right-peripheral head'-choice. Besides understanding exactly which rankings derive these types, what these types' core distinctive properties are and how the rankings accomplish their derivation, we want to also immediately point out the empirical adequacy of these claims. Each mixed type is introduced on the grounds of one primary concrete example – Tzotzil, Yosundùa Mixtec, and German (furthermore Persian). We will continue to use these grammars as

illustrative cases beyond this chapter. In the sections below, we will focus on certain key properties, as well as on why their basic word order suggests the particular *v*P-internal structure proposed here.

The mixed cases in place, we proceed in section 2.6 by asking which other grammars are predicted by a re-ranking of the constraints. We will find two further types, 'uniform [spec [head - complement]]' and 'uniform [spec [complement - head]]', the former supplying the structure for a uniform SVO-grammar, the latter for a uniform SOV-language.

2.3   The 'right-peripheral specifier'-choice and VOS

First, why is it at all sensible to categorize a VOS-language as a grammar with 'mixed' word order? Let us illustrate the answer, already sketched in the introductory chapter, in greater detail. Therefore, let us consider the Mayan language Tzotzil.

2.3.1   Tzotzil

As described by Aissen 1987, 1992, 1996, Tzotzil is a Mayan language of Mexico with the basic word order 'verb - object - subject' (VOS). See a transitive declarative clause in (14):

(14)   Tzotzil (cf. Aissen 1996:450):

      I-s- pas$_V$ mantal$_O$ [li vinik-e]$_S$.

      CP-A3-do   order   the man-ENC

      "The man gave the order."

The [head - complement]-directionality suggested by the VO-order is uniformly maintained throughout the grammar. For example, adpositions are *pre*positions in Tzotzil, meaning that they always precede their complement. (Tzotzil has very few adpositions of which the most common and least specified semantically is *ta*. *ta* is used to express all sorts of relations such as spatial or temporal location or instrumentality).[16]

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[16]Note in the examples in (15) that Tzotzil is a *pro-drop* language. Both subject and object (non-emphatic) personal pronouns can be left un-pronounced (cf. Aissen 1987:2). Back in (14), we should also notice that within the subject noun phrase, the determiner precedes the noun. In a DP-analysis following Abney 1987, this means that D^0

(15)   Tzotzil (cf. Aissen 1996:468):

    a.   I-kom   [**ta** s-na]   b.   I-s-tuch' [**ta** machita]

            cp-remain P   A3-house   cp-A3-cut   P   machete

            "He remained at his house."   "S/he cut it with a machete."

Likewise, both main clause and embedded *yes/no*-questions are introduced by the Q-particle *mi*, assumed by Aissen 1996:450 to occupy C^0, which then precedes its complement. Aissen 1996:451 furthermore reports that declarative CP-complements are generally introduced by the particle *ti*, evidently a complementizer in left-peripheral C^0. One example of an imbedded interrogative is given in (16). (Notice in (16) also the sentence initial negation marker *mu* (cf. Aissen 1987:13), which could be a head in pre-complement position).

(16)   Tzotzil (cf. Aissen 1996:451):

    Mu j-na'   **mi** ch-i-sut   tal.

    NEG A1-know Q   icp-B1-return DIR

    "I don't know if I am coming back."

But if Tzotzil is very strict with respect to its [head - complement]-preference, then where does the aspect of mixed directionality come in? As Aissen 1996:451 observes, the grammar has *right*-peripheral *lexical* specifiers, but *left*-peripheral *functional* specifiers. That is, the basic VOS-order can be straightforwardly explained by analyzing Tzotzil as a grammar with [[head - complement] specifier]-directionality in the verb phrase, implying that the subject surfaces inside the lexical projection (cf. Aissen 1992:46, 1996:449). The point though is that this right-orientation does not carry over beyond LexP, Spec. For example, *wh*-phrases must be fronted into a clause initial position, as such suggesting that they either move to a left-peripheral CP, Spec (cf. Aissen 1992:46, 1996: 451), or, at least, into a left-peripheral adjunct position. The pattern is shown in (17a). (17b) illustrates that the same holds for focused phrases:

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precedes its NP-complement. See more on the internal make-up of Tzotzil noun phrases in chapter 4.

(17)   a.   Tzotzil (cf. Aissen 1996:451):   b.   Tzotzil (cf. Aissen 1996:49):

Buch'u$_{S\text{-}wh}$ s-pas$_V$ mantal$_O$?   Pero chobtik$_{O\text{-}f}$ tztz'un$_V$ un.

who   A3-do   order   but   corn   A3-plant ENC

"Who is giving the order?"   "But it was corn he was planting."

Therefore, VOS Tzotzil does not seem too different from a uniform [spec [head - comp]] - grammar which surfaces with a basic order 'S - V - O'. Only the specifier of the verb phrase takes an unexpected orientation.

Lastly, we should be aware that Tzotzil shares the above directionality contrast with other VOS-languages. That is, while VOS-grammars are usually quite strict with respect to the generation of [head - complement], the right-peripheral orientation of the subject is not mirrored in a parallel right-peripheral alignment of functional specifiers or adjuncts. See, for example, in (18a) how the basic word order 'verb - object - subject' of the western Austronesian language Malagasy is paired with a pre-verbal adverb in a left-peripheral adjunct position. Then, in (18b), we see that Malagasy, just as Tzotzil, fronts *wh*-phrases. In Malagasy, localization of the *wh*-phrase in Spec, CP is even more suggestive, since it is generally followed by the focus particle *no*, which occupies C^0:

(18)   a.   Malagasy (cf. Rackowski & Travis 2000:122):

Efa   nanasa$_V$ lamba$_O$ Rakoto$_S$.

already   PAST.AT.wash   clothes   Rakoto

"Rakoto has already washed clothes."

       b.   Malagasy (cf. Rackowski & Travis 2000:130):

Iza$_{S\text{-}wh}$ **no**   mividy$_V$ [ny vary]$_O$ [ho an' ny ankizy]$_{IO}$

who   FOC   PRES.AT.buy   DET rice   for ACC DET children

"Who bought the rice for the children?"

With these data in mind, let us see how the current system captures them. Under the assumption that a VOS-language indeed leaves the subject inside the lexical layer in basic declaratives (see chapter 3 for the derivation of this syntactic feature), then, the surface order is the result of

choosing the 'right-peripheral specifier'-choice (A) as the optimal resolution in the general constraint conflict of HEAD LEFT/RIGHT, LEX HEAD EDGE, BRANCHING RIGHT and GENERALIZED SUBJECT. But under what conditions exactly is this the case?

2.3.2 Deriving VOS

Let us recapitulate here what the 'right-peripheral specifier'- choice is all about. It is the result of obeying LEX HEAD EDGE in a HEAD LEFT >> HEAD RIGHT -language, at the cost of violating BRANCHING RIGHT. (19) provides another look at the configuration:

(19)   The 'right-peripheral specifier'-choice:

```
                        LexP
                       /    \
                    Lex'     Spec
                   /    \
                Lex⁰    Compl
```
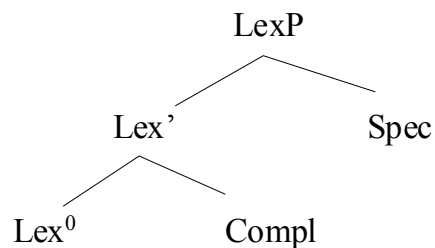
No violation of LEX HEAD EDGE, HEAD LEFT, GENERALIZED SUBJECT
One violation of BRANCHING RIGHT (for the right-peripheral orientation of Spec, LexP)
One violation of HEAD RIGHT (for the left-peripheral orientation of Lex^0)

While violating BRANCHING RIGHT, the 'right-peripheral specifier'-choice in (19) fully obeys not only LEX HEAD EDGE, but also GENERALIZED SUBJECT. HEAD RIGHT is violated once. Now, the configuration is the best choice if and only if it is the optimal conflict resolution. This happens in two possible ranking scenarios:

First, the 'right-peripheral specifier'-choice is optimal if not only the violation of LEX HEAD EDGE but also of both HEAD LEFT and GENERALIZED SUBJECT is more costly than the violation of BRANCHING RIGHT. Second, recall from tableau (12) above that the 'right peripheral specifier'-choice not only avoids violation of GENERALIZED SUBJECT and HEAD LEFT but also incurs *less* violations of HEAD RIGHT than the 'head movement'-choice does (the latter involves a second projection with a second head evaluated on HEAD LEFT/RIGHT). Therefore, choosing the

'right-peripheral specifier'- over the 'head movement'-configuration (and all other competitors) could also be due to ranking HEAD RIGHT higher than BRANCHING RIGHT.

Altogether, the reasoning implies that the 'right-peripheral specifier'-choice is optimal in a language with one of the following rankings. The claim is that a VOS-grammar such as Tzotzil is the outcome of one such ranking:[17]

(20)   Type A – VOS, Tzotzil:

    (i)   **LEX HEAD EDGE, HEAD LEFT, GEN SUBJECT >> BRANCHING RIGHT   &**
                  HEAD LEFT >> HEAD RIGHT

    (ii)   **LEX HEAD EDGE, HEAD LEFT, HEAD RIGHT >> BRANCHING RIGHT   &**
                  HEAD LEFT >> HEAD RIGHT; with GEN SUBJECT ranked anywhere

For a demonstration, let us look at a competition on the directionality of vP. Recall the four logical possibilities of structuring vP (shown in (8)), as well as the structural choices of obeying LEX HEAD EDGE which we have discussed in the previous section 2.2. The tableaux in (21.i) and (21.ii) below show how the $[_{vP} [_{v'}\ v^0$ complement] spec]-configuration becomes the optimal structure. This is either by low ranking of both BRANCHING RIGHT and HEAD RIGHT (cf. 21.i), or *despite* low ranking of GENERALIZED SUBJECT *if* HEAD RIGHT is still in an appropriately higher ranking position (cf. 21.ii). In both cases, with the object in complement position, and the subject surfacing in right-peripheral Spec, vP, the outcome is a basic order 'verb - object - subject'.

First, one general comment on the tableaux: Keep in mind, here and below, that we are mostly ignoring that in all candidates, the object is de facto contained in a root VP-shell which is the actual complement of v^0. As such, all candidates ultimately have one more HEAD RIGHT, or HEAD LEFT violation, depending on whether the V^0-copy/trace is left or right of its complement.

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[17]A comma between two constraints means that the constraints can be ranked either way without changing the choices on which candidate wins a competition.

In this respect, the total sum of logical possibilities to rank a certain set of constraints (here, we have five constraints, hence, we get 5! = 120 distinct possibilities) can collapse into (many) less distinct syntactic types if several ranking possibilities still yield the same grammar (likewise, also (i) and (ii) in (13) yield the same grammar).

This additional violation cannot alter any decision on optimality, as shown in the tableaux (since one such violation is unavoidable across possible candidates). I have omitted it for better readability. The simplification also illustrates that the system's factorial typology of mixed and uniform basic word order typology is *not* contingent upon the theoretical choice of assuming a *v*P-VP-layered structure and generating the subject in Spec, *v*P rather than in Spec, VP. Beyond that, once more for better accessibility, the tableaux in (21) and below show only those candidates relevant to the current discussion. Further candidates which could never win a competition independent of the set's ranking will be separately discussed in section 2.4. Finally, keep in mind that in this chapter, we are ignoring the inflectional layer in the equation of basic word order. We will get to the reason why the subject does not move into IP in VOS-grammars in chapter 3. Then, let us look at the competition:

(21) Mayan Tzotzil (data cf. Aissen 1996:450):

I-s-[$_{vP}$ [$_{v'}$ pas$_v$ mantal] [li vinik-e]$_{Spec}$].

CP-A3-   do   order   the man-ENC

"The man gave the order."

(i) 'Optimal VOS' by low ranking of both BRANCHING RIGHT and HEAD RIGHT:

	LEX HD EDGE	HD LEFT	GEN SUBJECT	BRANCH RIGHT	HEAD RIGHT
☞ a. [$_{vP}$ [$_{v'}$ v^0 object] subject]: VOS				*	*
b. [$_{vP}$ [$_{v'}$ v^0 [$_{vP}$ subject [$_{v'}$ t_V object]]]]: VSO			*!		**
c. [$_{vP}$ subject [$_{v'}$ object v^0]]: SOV		*!			
d. [$_{vP}$ subject [$_{v'}$ v^0 object]]: SVO	*!				*
e. [$_{FP}$ [$_{F'}$ v^0- F^0 [$_{vP}$ subj [$_{v'}$ t_V obj]]]]	*!		*		**

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(ii) 'Optimal VOS' by sufficiently high ranking of HEAD RIGHT:

	LEX HD EDGE	HD LEFT	HEAD RIGHT	BRANCH RIGHT	GEN SUBJECT
L a. [$_{vP}$ [$_{v'}$ v^0 object] subject]: VOS			*	*	
b. [$_{vP}$ [$_{v'}$ v^0 [$_{vP}$ subject [$_v$ t_V object]]]]: VSO			**!		*
c. [$_{vP}$ subject [$_{v'}$ object v^0]]: SOV		*!			
d. [$_{vP}$ subject [$_{v'}$ v^0 object]]: SVO	*!		*		
e. [$_{FP}$ [$_{F'}$ v^0- F^0 [$_{vP}$ subj [$_{v'}$ t_V obj]]]]	*!		***		*

The tableaux in (21) not only demonstrate that, under a type A -ranking, the 'right-peripheral specifier'-candidate (a) wins over both the 'head movement'-candidate (b) and the 'right-peripheral head'-candidate (c); we also see that the winner (a) beats the head-medial configuration (d), since (d) violates LEX HEAD EDGE. If we force the head to be at left of its complement, by HEAD LEFT >> HEAD RIGHT, then aligning the *v*P-specifier left of its sister violates LEX HD EDGE.

The tableaux in (21) include one other candidate, (e), in order to draw attention to an additional issue early on. Candidate (e) is a structure in which the lexical head v^0 has moved into a functional projection. The candidate loses, not only due to its GENERALIZED SUBJECT violation in combination with additional HEAD RIGHT violations,[18] but furthermore, because it violates LEX HEAD EDGE. The latter is the case despite the fact that, in absence of a functional specifier, the v^0-F^0-complex is at the edge of FP. The point is precisely that it doesn't matter for LEX HEAD EDGE, where in FP the verbal head surfaces. Recalling the exact definition of LEX HEAD EDGE, the constraint can only be obeyed by edge alignment with a *perfect* maximal projection of a *lexical* head. FP cannot satisfy these requirements per se. Now, (e) seems to do fatally worse than all its competitors in (21). However, it would be quite premature to infer that movement of a lexical head into a functional projection is never a possibility and couldn't be forced by additional constraints (any such additional constraint would bring (e) and related candidates back

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[18]See chapter 3 for why the candidate has two (instead of just one) more HEAD RIGHT violations.

into the competition). As already suggested above, we will come back to this issue in chapter 3, when we discuss the inflectional layer. At this point, we just want to explicitly acknowledge the fact that satisfaction of LEX HEAD EDGE can only be accomplished inside the lexical domain itself. That said, we can infer and preview that any clause with 'basic VOS'-order must be a clause in which not only the subject is in a vP-internal base position (a right-peripheral specifier), but also the verbal head is inside that same vP.[19]

More generally, we can infer that a language with a ranking that favors satisfaction of LEX HEAD EDGE will try to resist lexical-head movement into a functional projection.

Now, how does a type A-ranking manage to derive a grammar with the particular kind of mixed directionality we have depicted above? That is, why exactly are lexical specifiers the only phrases (besides complements) that can be on the right of their sisters. Why are functional specifiers and, in general, adjuncts always on the left side? The answer is already at hand: we just highlighted that LEX HEAD EDGE is only relevant inside a lexical XP. Consequently, the directionality of both the lexical specifier and the complement has an impact on the satisfaction of LEX HEAD EDGE, but no adjunct or functional specifier has. In a type A-language, this means that the choice of violating BRANCHING RIGHT for the sake of LEX HEAD EDGE becomes irrelevant in the functional domain, and in turn, satisfaction of BRANCHING RIGHT is possible. That is, in all contexts in which LEX HEAD EDGE is mute, BRANCHING RIGHT directs the alignment. This is one of the essential aspects of an Optimality theoretic framework: lower ranked constraints are never completely 'silent', but rather co-determine grammatical structure whenever the context allows it. Consider first a demonstration on XP-adjuncts, which picks up the Malagasy example we have seen in (18a) above. In the structure in (22), the pre-verbal adverb is adjoined to vP, but the ultimate adjunction site is not essential to the point at stake. What is crucial is rather the optimality of the left- as opposed to a right-peripheral orientation. At the same time, we have to recognize that the left-periphery is even optimal if a phrase adjoins to

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[19]In a scenario in which the subject has moved out of vP and the verb remains inside that vP, the trace of the subject will still align right-peripherally in type A, in order to ensure satisfaction of LEX HEAD EDGE. This is the aspect that a trace of a lexical head is not evaluated on LEX HEAD EDGE, but *surrounding* traces nevertheless *hinder* a lexical head from surfacing at an edge of its perfect maximal projection (see 2.2, and there, the introduction of LEX HEAD EDGE).

lexical vP:

(22)   Malagasy (cf. Rackowski & Travis 2000:122):

        [$_{vP}$ efa [$_{vP}$ nanasa$_v$ lamba$_O$ Rakoto$_S$]]

         already   PAST.AT.wash   clothes   Rakoto

         "Rakoto has already washed clothes."

(i)-ranking of type A – Phrases adjoined to vP or any other XP align left-peripherally:

	LEX HEAD EDGE	HEAD LEFT	GEN SUBJECT	BRANCH RIGHT	HEAD RIGHT
L a. [$_{vP}$ Adj [$_{vP}$ [$_{v'}$ v^0 object] subject]				*	*
b. [$_{vP}$ [$_{vP}$ [$_{v'}$ v^0 object] subject] Adj]				**!	*

(ii)-ranking of type A – Phrases adjoined to vP or any other XP align left-peripherally:

	LEX HEAD EDGE	HEAD LEFT	HEAD RIGHT	BRANCH RIGHT	GEN SUBJECT
L a. [$_{vP}$ Adj [$_{vP}$ [$_{v'}$ v^0 object] subject]			*	*	
b. [$_{vP}$ [$_{vP}$ [$_{v'}$ v^0 object] subject] Adj]			*	**!	

In (22), candidate (a) adjoins an XP left-peripherally to vP, candidate (b) chooses a right-peripheral orientation. Both (a) and (b) share the [$_{vP}$ [$_{v'}$ v^0 complement] spec]-order, which, we know, is the optimal vP-internal organization for type A. Both (a) and (b) satisfy LEX HEAD EDGE. To see why, recall the exact definition of LEX HEAD EDGE. It is satisfied as long as lexical v^0 aligns at an edge of a perfect vP. This is the case in both (a) and (b): v^0 aligns with the left edge of the smaller vP node, regardless of the fact that XP-adjunction creates a *second* larger vP-node. Proper edge alignment holds, even if we are taking into account that the two vP-nodes are two segments of the same maximal projection such that, being precise, we have to take them as one 'inseparable' unit. The verbal head v^0 aligns with an edge of this unit. Compare the adjunction configuration with a thick wall: we would evaluate the alignment of that wall with some element without considering how thick the wall is and what kind of pipes might be pressed

inside it. Of course, it is certainly still a stipulation to define proper edge alignment in the above way. As a matter of fact, *any* definition is a kind of stipulation. The comparison only reveals that there is a natural way to think about the formulation put forward here.

If the presence and location of the XP-adjunct has no impact on the violation profile of LEX HEAD EDGE, it still does matter for BRANCHING RIGHT. As we have seen in the previous section, any right-peripheral adjunction violates BRANCHING RIGHT. Henceforth, candidate (a) wins over (b) in (22); neither one violates LEX HEAD EDGE, but (b) violates BRANCHING RIGHT, and (a) does not.

The same logic – violation of BRANCHING RIGHT is accepted if it prevents violation of LEX HEAD EDGE but not otherwise – determines the left-peripheral orientation of any XP that is a functional specifier. We always have the same conflict. In (23), we see the *wh*-question from (17a). The structure with the *wh*-phrase in Spec, CP (and an abstract C^0)[20] follows Aissen 1996. That the specifier precedes its C'-sister, despite the fact that we are looking at a VOS-grammar, is explained by the general influence of BRANCHING RIGHT and the silence of LEX HD EDGE:

(23)   Mayan Tzotzil (cf. Aissen 1996:451):

$[_{CP}$ Buch'u C^0 $[_{IP}$ s-pas$_v$ mantal]]?

          who   A3-do   order

          "Who is giving the order?"

Functional specifiers are on the left of their sister nodes ((i)-ranking; (ii)-ranking same output):

	LEX HEAD EDGE	HEAD LEFT	GEN SUBJECT	BRANCH RIGHT	HEAD RIGHT
☞ a. $[_{CP}$ Wh-spec $[_{C'}$ C^0 IP]]					*
b. $[_{CP}[_{C'}$ C^0 IP] Wh-spec]				*!	*

One additional factor is worthwhile to point out: The dynamics of BRANCHING RIGHT and LEX HEAD EDGE not only predict that any phrasal adjunct above *v*P and any *functional* specifier

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[20]Aissen 1996:449-452 implicitly, though not explicitly, suggests that C^0 is abstract in Tzotzil *wh*-questions.

preferably precedes its sister node; they also predict that, in a transitive structure in which the verb is in v^0, and as such has left the root VP, the lexical specifier of this root VP does not align right-, but rather left-peripherally. Obviously, where the lexical head surfaces at an edge of perfect lexical vP, there is no need for the lower lexical shell to adjust the position of its specifier. Since LEX HEAD EDGE is already satisfied, BRANCHING RIGHT can once more determine the directionality. What does this mean in terms of word order? It means that if we have two object arguments linked into VP, then, the one in Spec, VP, usually the THEME, is expected to precede the one in complement position, cf. [$_{vP}$ v_v^0 [$_{VP}$ object$_{THEME}$ t_V object$_{GOAL}$/PP] subject]. This gives us 'verb - direct object - indirect object - subject' word order:

(24)   a.   Tzotzil (cf. Aissen 1987:105):

7i- j- meltzan-be$_V$ [j- p'ej na]$_O$ [li Xun-e]$_{IO}$.

cp A1 make-*io*   one *nc* house the Xun-*cl*

"I made a house for Xun."

b.   Malagasy (cf. Guilfoyle, Hung & Travis 1992:380):

manasa$_V$ [ny lamba]$_O$ [amin'ny savony]$_{IO}$ [ny zazavavy]$_S$.

AT.wash   the clothes   with the   soap   the girl

"The girl washes the clothes with the soap."

As illustrated in (24), both Tzotzil and Malagasy confirm this expectation (note that in Tzotzil the addition of a second object argument requires the occurrence of the suffix *-be* on the verb; for more details on ditransitives, see Aissen 1987:ch.7). Nevertheless, we have to take the observed facts with a grain of caution. This is because we introduced the linking hierarchy as a working hypothesis, conceding that grammars might differ with respect to the hierarchical mapping of their objects (either across the board or depending on context). If they do differ in this way, then the system predicts that surface order will be reversed. For this reason, we won't dive deeper into this issue, as it would ultimately take us too far away from our primary concerns. But it is important to be aware of the prediction, since it opens an interesting terrain for further research.[21]

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[21]Just one example: Malagasy shares with other Austronesian languages the possibility of a particular kind of

Altogether, let us conclude this section by summarizing what we have derived so far. The rankings of type A generate a grammar with the following core properties. The claim is that these properties match those of VOS-languages such as Tzotzil and Malagasy, which have a mixed, but *systematically* mixed, word order:

(25)   Core properties of type A:
  i.   Every projection has a [head - complement]-order.
  ii.   A *lexical* head that surfaces inside a lexical shell has a *right*-peripheral specifier if that specifier exists.

    Basic 'V - O - S'-order corresponds to a *v*P containing both the verb in head position and the subject in a right-peripheral specifier position.

  iii.   Any *v*P (and VP) preferably has a specifier (possibly a copy/trace).
  iv.   Phrases that are adjoined to a lexical XP or to any functional projection align *left*-peripherally.
  v.   Functional specifiers align *left*-peripherally.

2.4   The 'head movement'-choice and strict VSO

Let us start this section by introducing one empirical example of a strict VSO-language, to illustrate what I mean by 'strict' and, furthermore, how the aspect of mixed directionality plays a role in VSO-languages. Consider therefore Yosondúa Mixtec.

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passive formation (depending on a morphological change on the verb). Here, a THEME or also an oblique can be promoted to take the subject position. Meanwhile, the AGENT is not suppressed but rather demoted to the position of the THEME (yielding in Malagasy either a 'verb - AGENT - oblique - THEME$_{Subj}$'-, or a 'verb - AGENT - THEME - oblique$_{Subj}$' -order).

One could explore whether such passive formation is in fact rooted in a change of linking hierarchy, meaning that the promoted argument is base generated in Spec, *v*P, whereas the AGENT has to take the next highest linking position, Spec, VP. Beyond accounting for the distinct word order, the localization of the demoted AGENT into a position which c-commands V^0's complement would explain that the AGENT still maintains certain subject properties such as reflexivization and control. See Guilfoyle, Hung & Travis 1992 for an analysis which entirely matches the hierarchy and directionality of the structures envisaged here, with the only difference that Guilfoyle, Hung & Travis identify the right-peripheral specifier hosting the subject as Spec, IP, and not Spec, *v*P as in my proposal.

2.4.1   Yosondúa Mixtec

Following the description of Farris 1992, Yosondúa Mixtec is a Mixtecan language with the basic word order 'verb - subject - object' (VSO). See a declarative transitive clause in (26):

(26)   Yosondúa Mixtec (cf. Farris 1992:10):

shíkó$_V$ ñ~$_S$ nãni$_O$

CON:sell   she   corn

"She is selling corn."

Since Koopman & Sportiche 1991, who elaborated upon Chung & McCloskey 1987 on Irish and Welsh, much generative work has been done in order to establish that VSO-languages are 'SVO-grammars in disguise' (see in particular McCloskey 1991, 1996; McCloskey 1997 for an overview). That is, the 'V - S - O' -surface order is a result of leftward verb movement, out of a verb phrase with [spec$_S$ [head$_V$ - complement$_O$]]-order: 'V$_i$ - S - t_i - O'.

Now, the first thing to notice about Yosondúa Mixtec is that the grammar is truly strict with respect to the preference of a [head - complement]-order. For example, adpositions are necessarily prepositions:

(27)   Yosondúa Mixtec (data cf. Farris 1992:10):

xáhnja$_V$ ná$_S$ ndãku$_O$ [**xíín**$_P$ d~]

CON:cut   I:RES   firewood   with   him

"I am cutting firewood with him."

Likewise, embedded declarative clauses are introduced by the complementizer *x~*and embedded *yes/no*-questions by the complementizer *nú*, suggesting that C^0 precedes its complement. Two examples are given in (28a) and (b); in (b), we should further notice the negation marker *tu*, which could be, once more, a head in pre-complement position:

(28)   a.   Yosondúa Mixtec (cf. Farris 1992:29):

kánúú   x~   k§h§n   d~

CON:be:important   that   POT:go   he

"It is important that he goes."

       b.   Yosondúa Mixtec (cf. Farris 1992:42):

tu xín§   ná   **nú**   k§h§n   d~

NEG CON:know   I:RES   if   POT:go   he

"I don't know if he will go."

Now, what is 'strict' about Yosondúa Mixtec? The point is that VSO-languages like Yosondúa
Mixtec never depart from the VSO-order in declarative clauses, no matter what the higher
functional context is.

We have to review here the standard view about the Celtic type of VSO: The leftward
verb movement which yields the V-first pattern targets the functional Infl-head. Evidence for this
comes from complex verb constructions, in which the tense is picked up by an auxiliary,
resulting in an 'Aux - S - V - O'- surface order. Crucially, Yosondúa Mixtec does not allow such
a configuration. On the contrary, in complex verb constructions, the surface order is still
'V_1 - $V_{2\text{-main}}$ - S - O'. The following shows two examples, one with a clause initial modal, the
other with a finite directional (Yosondúa Mixtec has many such directionals, which are reduced
forms of motion verbs (Farris 1992:52)):[22]

(29)   Yosondúa Mixtec (data cf. Farris 1992:29, 53):

   a.   Kúã   sáh~$_V$ d~$_S$ Nn§ã$_O$.   b.   Kw~n k§hin$_V$ d~$_S$ nãni$_O$.

        POT:be:possible POT:do   he   work   INC:go POT:take   he   corn

        "He can work."   "He has gone to get corn."

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[22]See chapter 3 for further evidence that 'Yosondúa Mixtec VSO' cannot be the outcome of verb-to-I^0
movement.

Yosondúa Mixtec is not the only VSO-language which shares this kind of strictness. Another example is Greek, for which Alexiadou 1999:53 claims that its 'Aux - V - S - O'-orders are the result of leftward $V_{participle}$ -movement happening *below* AgrSP/TP (= IP):[23]

(30)   Greek (Alexiadou 1999:51):

An **ehun$_{Aux}$** idhi **mathi$_V$** kala [i Kokini]$_S$ [to sistima tus]$_O$.
if   have   already learnt well   the-Reds-nom   the system cl-gen-pl
"If the Reds have already learnt their system well..."

In chapter 3, we will see that the Mixtecan kind of strict 'verb - subject - object'-order, which is indifferent to the representation of the Infl-node, appears to be rather common, while, potentially surprising, the Celtic type is particularly rare. Therefore, it might very well be the case that most VSO-languages can be grouped under the type exemplified here by Yosondúa Mixtec

This pattern is straightforwardly explained by correlating it to the 'head movement'-choice mentioned above. That is, the 'VSO'-order is still recognized as the outcome of leftward verb movement out of a verb phrase with [spec [head - complement]]-directionality. But the target of the movement is, like the source, a lexical projection, and the movement is driven by purely structural needs: to align the lexical head at an edge of a perfect LexP.

It is important to be aware that these structural needs do not extend into the functional layer, and that this is empirically desirable as well. Here, we get to the point of why we want to talk about 'mixed' directionality in a strict VSO-grammar. The following illustrates that, despite the fact that the verb apparently dislikes to surface under the roof of a lexical specifier hosting the subject, there is no reluctance for higher left-peripheral adjuncts or functional specifiers to occur. No head has 'jumped over' the adverb *xa* 'already' in (31); and (32) exemplifies that *wh*-phrases must be fronted in Yosondúa Mixtec into a clause-initial position, which is not preceded

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[23]Greek shows 'S - V - O'- and 'V - O - S'-orders alongside with (strict) 'V - S - O'. Alexiadou 1999:49, following Alexiadou 1994, 1996, Alexiadou & Anagnostopoulou 1995, 1998, identifies 'SVO' to be the result of left dislocation, the subject here in fact being a topic which sits in a specifier of a Topic phrase above IP. Similarly, 'VOS' is recognized as the result of leftward object movement serving informational needs (that is, a non-focal object is forced to move out of the focus domain; cf. Alexiadou 1999:59).

by any complementizer head.

(31)   Yosondúa Mixtec (cf. Farris 1992:56):

     Xa   yáxí$_V$ d~$_S$ nd$\S$~$_O$.

     already CON:eat he   banana

     "He is already eating a banana."

(32)   Yosondúa Mixtec (cf. Farris 1992:36):

     [N~ã chaa]$_{S\text{-}wh}$ ni xahan$_V$ [xíín ní]?

      what man   COM COM:go   with you:RES

     "Which man went with you?"

Altogether, I propose that Yosondúa Mixtec is the outcome of a grammar which systematically applies the 'head movement'-choice in verbal extended projections. But under exactly what conditions does the 'head movement'-choice become the optimal configuration?

2.4.2   Deriving strict VSO

The 'head movement'-choice is the choice of obeying LEX HEAD EDGE through violation of HEAD RIGHT and, in a clause, GENERALIZED SUBJECT. Therefore, it is the choice of a grammar which prefers [head - complement] over [complement - head] (by HEAD LEFT >> HEAD RIGHT). Second, the grammar must prefer to satisfy LEX HEAD EDGE. Third, it must be willing to violate both GENERALIZED SUBJECT and HEAD RIGHT, but neither HEAD LEFT nor BRANCHING RIGHT, for satisfaction of LEX HEAD EDGE. Such a grammar will break up any
[$_{LexP1}$ spec [$_{Lex'}$ Lex^0 complement]]-configuration by moving the lexical head out and creating a second lexical projection, LexP2, above LexP1, in order to allow the lexical head to align with an edge of its lexical domain. LexP2, then, necessarily lacks a specifier or nothing is gained with respect to alignment. The complete configuration is shown in (33).

(33)   The 'head movement'-choice:

LexP2
   |
Lex'
    /   \
Lex⁰   LexP1
         /   \
    Spec   Lex'
            / \
          t   Compl
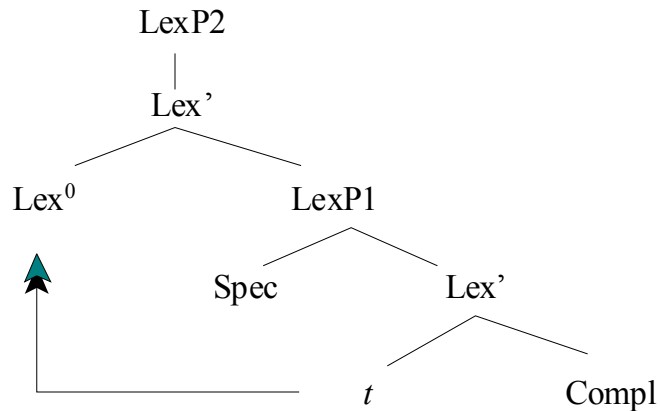
No violation of LEX HEAD EDGE, HEAD LEFT, BRANCHING RIGHT

Two violations of HEAD RIGHT (for the left-peripheral orientation of Lex⁰ and its copy)

One violation of GEN SUBJECT in clauses (for the missing Spec, LexP2)

Given what we just said, the 'head movement'-choice is always optimal if and only if a language has a ranking that matches one of the options given in (34) below. That is, the triple LEX HEAD EDGE, HEAD LEFT and BRANCHING RIGHT must be ranked above both HEAD RIGHT and GENERALIZED SUBJECT. The claim is that Yosondúa Mixtec, and any language with the same 'strict' version of VSO, has one of these rankings:

(34)   Type B – strict VSO, Yosondúa Mixtec:

LEX HEAD EDGE, BRANCHING RIGHT, HEAD LEFT >> HEAD RIGHT, GENERALIZED SUBJECT

The surface 'verb - subject - object'-order is strict in type B, since the ranking never allows a verb to surface between its specifier and its complement, hence, between subject and object. Instead, the main verb always moves to the left, across the subject-specifier, yielding VSO. Given the current reasoning, the main verb does *not* raise in order to fulfill the needs of some (functional) target position, but rather to satisfy the desire to align at an edge of its lexical domain. That is why the movement systematically happens regardless of what else is contained

in the clause.[24]

To get a grasp on the ranking dynamics, let us look again at a *v*P-competition, this time under the type B ranking. The tableau in (35) shows how the promotion of BRANCHING RIGHT to a higher ranking position changes the output choice and elects the 'head movement'-candidate (b) as optimal. Keep in mind that we are presently ignoring the inflectional layer, and assuming that, in strict VSO-grammars, neither the verb nor the subject moves into IP (chapter 3 will explain why this is the case).

(35)   Yosondúa Mixtec (data cf. Farris 1992:29):

Kúã   [$_{vP}$ [$_{v'}$ sáh~$_{v}$ [$_{vP}$ d~ [$_{v'}$ t_V Nn§iã]]]].
POT:be:possible POT:do   he   work
"He can work."

'Optimal strict VSO' by low ranking of both GEN SUBJECT and HEAD RIGHT:

	LEX HD EDGE	HD LEFT	BRANCH RIGHT	GEN SUBJECT	HEAD RIGHT
a. [$_{vP}$ [$_{v'}$ v^0 object] subject]: VOS			*!		*
☞ b. [$_{vP}$ [$_{v'}$ v^0 [$_{vP}$ subject [$_{v'}$ t_V object]]]]: VSO				*	**
c. [$_{vP}$ subject [$_{v'}$ object v^0]]: SOV		*!			
d. [$_{vP}$ subject [$_{v'}$ v^0 object]]: SVO	*!				*
e. [$_{FP}$ [$_{F'}$ v^0-F^0 [$_{vP}$ subject [$_{v'}$ t_V object]]]]	*!			*	**

If we compare candidates (b) and (e), we see that the system really interprets the Mixtecan kind of VSO as due to a verb movement that takes place inside the lexical layer. Moving the verb into a functional projection isn't of much help if the motivation is to be at an edge of perfect LexP.

---

[24]The verb movement is predicted to happen even if the subject has actually left its base position. This is due to the fact that surrounding traces still hinder a lexical head from proper edge alignment (recall again the introduction of LEX HEAD EDGE in section 2.2). The projection of a second *v*P would only become obsolete if the verb completely left *v*P, moving into some higher functional projection.

Thus, (b) beats (e), since (e) incurs a violation of LEX HD EDGE that (b) does not share.

Besides making sure that the 'head movement'-choice is optimal inside the lexical layer, the type B grammar also accounts for the fact that XP-adjuncts can and do precede a lexical or functional head, and so do functional specifiers. This is another consequence of the fact that LEX HEAD EDGE is mute outside LexP. Therefore, just as the 'right-peripheral specifier'-choice of type A could only win inside a lexical projection, so the 'head movement'-choice of type B can only succeed inside that same domain.

We see in (36) the situation for a single functional head that has a specifier, which satisfies GENERALIZED SUBJECT without violating LEX HEAD EDGE. Consequently, the need for head movement vanishes, and so does the optimality of the 'head movement'-choice. On the contrary, transforming $[_{FP1}$ spec $[_{F'}$ F^0 compl]] into $[_{FP2}$ $[_{F'}$ F^0 $[_{FP1}$ spec $[_{F'}$ t_F comp]]]] costs an additional HEAD RIGHT violation plus a violation of GENERALIZED SUBJECT with no compensating advantages. In tableau (36), it is the head-medial FP, candidate (a), which wins over candidate (b) with functional head movement. As an illustration, recall the Mixtecan *wh*-question seen in (32) above, repeated here as (37):

(36)   No 'head movement'-choice in the functional domain:

	LEX HEAD EDGE	HEAD LEFT	BRANCH RIGHT	GEN SUBJECT	HEAD RIGHT
L a. $[_{FP1}$ spec $[_{F'}$ F^0 compl]]					*
b. $[_{FP2}$ $[_{F'}$ F^0 $[_{FP1}$ spec $[_{F'}$ t_F comp]]]]				*!	**(!)

(37)   Yosondúa Mixtec (cf. Farris 1992:36):

[N~ã chaa]$_{S-wh}$ **ni** xahan$_V$ t_S [xíín ní]?

what man   COM COM:go   with you:RES

"Which man went with you?"

Attention should be given to the aspect particle *ni* (expressing completive aspect) in (37), which intervenes between the verb and the fronted *wh*-phrase. In chapter 3, *ni* will be recognized as a head occupying T^0. This entails that the *wh*-phrase must be at least as high as Spec, TP. It could

also be adjoined to TP, or it could be located in Spec, CP. In the latter scenario, it could be the case that the T-head has in fact moved to C^0. All these interpretations of the data are compatible with the current classification of Yosondúa Mixtec as a type B -grammar. Given (36), we do not expect any functional head to cross the *wh*-phrase, yielding something like '*ni - N~ã chaa ...'.

Furthermore, be aware that the general preference for unbroken Spec-head-configurations in functional projections remains unchanged even if FP contained a lexical head as a result of movement and head-to-head-adjunction of Lex^0. We cannot exclude the possibility that further, higher ranked, constraints force the movement of a lexical head into a functional projection. In such a situation, of two candidates, one, (a), with FP1 only, $[_{FP1}$ spec $[_{F'}$ Lex^0+F^0 comp]], the other, (b), with FP1 plus FP2, $[_{FP2}$ $[_{F'}$ Lex^0+F^0 $[_{FP1}$ spec $[_{F'}$ t_F comp]]]], *both* (a) and (b) violate LEX HEAD EDGE. The point is once more that a lexical head can never satisfy LEX HEAD EDGE inside a functional projection, given that FP is not a perfect projection of a lexical head. Hence, even if the complex head Lex^0+F^0 aligns at an edge of FP (which it does in (b)), LEX HEAD EDGE is still violated. At the same time, only (b), which contains the specifier-less FP2, violates GENERALIZED SUBJECT, and, (b) incurs an additional HEAD RIGHT violation inside FP2 to boot.[25] Altogether, (b), representing the 'head movement'-choice, is less harmonic than (a). This is shown in tableau (38), with '+ Lex move' representing a hypothetical constraint that forces the movement of the lexical head into FP1. Correspondingly, a candidate (c) which avoids the movement is kicked out of the competition, and the ultimate winner is (a):

(38)   No 'head movement'-choice in the functional domain, even if a lexical head is involved:

	+ Lex move	LEX HEAD EDGE	HEAD LEFT	BRANCH RIGHT	GEN SUBJECT	HEAD RIGHT
L a. $[_{FP1}$ spec $[_{F'}$ Lex^0- F^0 compl]]		*				**
b. $[_{FP2}$ $[_{F'}Lex^0$-F^0 $[_{FP1}$ spec $[_{F'}$ t_F compl]]]]		*			*!	**(!)*
c. $[_{FP1}$ spec $[_{F'}$ F^0 compl]]	*!					*

---

[25] See chapter 3 for the details of how HEAD RIGHT violations accumulate.

We have seen that a functional specifier does not need to be crossed by the corresponding functional head, whether or not that head has a lexical head adjoined to it. We have also already discussed in the previous section that phrases can adjoin to VP/*v*P or higher without any distinctive impact on LEX HEAD EDGE. Consequently, in type B-languages, XP-adjuncts are not an occasion for the 'head movement'-choice either. Then, data of the kind seen in (31), with an adverb preceding a plain 'V - S - O'-sequence, could perfectly well be cases of *v*P-adjunction. Tableau (39) shows how simple adjunction (in (a)) wins over an 'additional head movement'-application (candidate (b)):

(39)   No head movement in order to cross an XP-adjunct:

	LEX HEAD EDGE	HEAD LEFT	BRANCH RIGHT	GEN SUBJECT	HEAD RIGHT
L a. [$_{vP2}$ Adj [$_{vP2}$ v^0 vP$_1$]]				*	*
b. [$_{vP3}$ [$_{v'}$ v^0 [$_{vP2}$ Adj [$_{vP2}$ t_V vP$_1$]]				**!	**(!)

Summarizing this section, we have derived the following core properties of type B. This makes it possible to explain the emergence of a basic strict VSO- order in languages like Yosondúa Mixtec:

(40)   Core properties of type B:

i.   Every projection has a [head - complement]-order.

ii.   Under the assumption that the subject is base generated in a *v*P-internal specifier position, the corresponding verbal head always crosses the specifier and surfaces in an additional *v*P, projected above the original one.
        Basic 'V - S - O'-order corresponds to two *v*Ps: the lower one contains the subject (remaining in situ), followed by the verb copy, followed by the object; the higher one contains the raised verb followed by the *v*P-complement.

iii.   VSO is strict, since movement of the main verb happens independently of the co-presence of further (auxiliary/modal) verbs, or functional heads.

iv.   Specifiers, both lexical and functional, align left-peripherally.

v.   Adjuncts align left-peripherally.

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vi.   Whereas the main verb obligatorily moves to the left of the subject's base position, it does not cross any functional specifier, nor any adjunct. Likewise, functional heads do not move to the left of their specifiers without additional independent motivation.

2.5   The 'right-peripheral head'-choice and SOV despite preference for [head - comp]

As a last mixed type with a default preference for [head - complement]-order, let us discuss how an SOV-language can be a grammar with mixed directionality. Consider first the Germanic language German.

2.5.1   German

German, in many respects, can be described as a grammar that prefers a [head - complement]-order (for a complete comparison of the basis word order in German and six other Germanic languages, see, for example, Webelhuth 1992:ch.2). For example, as illustrated in (41), adpositions are *pre*positions. In (42), we see that nouns can take PP-complements, which then have to follow the nominal head. In both (41) and (42), notice that the determiner is in pre-nominal position. In a DP-analysis following Abney 1987, this indicates that D^0, hosting the determiner, is left of its NP-complement:[26]

(41)   German:

    a.   **unter$_P$** dem Druck   b.   **mit$_P$** der Welt

        under   the   pressure   with   the   world

        "under the pressure"   "with the world"

(42)   German:

    die **Angst$_N$** [$_{PP}$ vor dem Krieg]

    the fear   before the war

    "the fear of the war"

---

[26]German has a few postpositions. See section 5.4 for discussion thereof. See more on noun phrases in chapter 4. On adjectives, see sections 5.1-5.2.

Furthermore, complementizers, such as the declarative *dass* 'that' or the causative *weil* 'because, since', precede the clause, indicating that they are to the left of their complements:

(43)   German:

    ..., **weil**$_C$ [er nicht glauben wollte], **dass**$_C$ [es schlecht ausgehen wird].

      since he not believe wanted   that   it bad   end   will

    "... since he didn't want to believe that it will end badly."

Then, there is the phenomenon of Verb Second, which German shares with all other Germanic languages except English. We will discuss Verb Second in section 3.5.2; at this point we just want to be aware that, in all main clauses, the finite verb surfaces in second position, following an arbitrary constituent:

(44)   German:

    a.   Leider$_{Adv}$ **hat**$_{V\text{-}F}$ [er nicht über die Konsequenzen nachgedacht].

          unfortunately have-PRESENT he not   about the consequences   thought

          "Unfortunately, he hasn't thought about the consequences."

    b.   [Die Gräfin]$_S$ **verehrte**$_{V\text{-}F}$ [.. [den Butler]$_O$ ..]

          the countess admire-PAST   the butler

          "The countess admired the butler."

While there is still a dispute in the generative literature on what the target projection of Verb Second is, we can probably say that there is a consensus with respect to the following claim: a Verb Second structure is the result of *moving* the finite verb into a *functional* projection, the phrase in initial position occupying the specifier thereof. This assumption of a derived position goes back to Bach 1962, Bierwisch 1963, Klima 1975, Koster 1975, den Besten 1977, Thiersch 1978. Koster, den Besten and Thiersch identified the target projection as CP, based on the fact that, in most Verb Second languages (see Vikner 1995 for the exceptions of Icelandic and Yiddish), Verb Second never occurs under a complementizer, but only in root clauses in which

the complementizer is absent.[27] The fact that is relevant at present is that the functional head targeted by the verb movement whatever it is likewise precedes its complement.

Then, where is the aspect of mixed directionality? It concerns the position of the verb in all non-Verb Second contexts: the verb surfaces on the *right* of the object, which itself follows the subject. We thus get a basic order 'subject - object - verb'; for the object to follow the verb is ungrammatical. Some of the verb-finality is already visible in the subordinated clauses in (43), with the finite verb following the infinitive, and in (44a), with the main verb participle following the PP. Here is an embedded declarative transitive clause:

(45)   German:

    a.   ..., dass [der Butler]$_S$ [die Gräfin]$_O$ küsste$_V$.

            that   the butler   the countess   kissed

          "... that the butler kissed the countess."

    b.   *..., dass [der Butler]$_S$ küsste$_V$ [die Gräfin]$_O$.

Taken at face value, the OV-order suggests that, in the syntactic structure of sentences such as in (45), the verbal head follows its complement, disregarding the otherwise preferred [head - complement]-order. This is precisely the analysis adopted here, with the verbal head surfacing in a head-final VP/*v*P in all non-Verb Second contexts.[28]

Given the overwhelming body of generative work on German (and the Germanic languages), one comment is in order. The assumption that the verb phrase is head-final in German has a long tradition, see for example Bach 1962, Bierwisch 1963:34ff, Bartsch & Vennemann 1972, Esau 1973, Klima 1975, Koster 1975, den Besten 1977, Thiersch 1978, Reis 1985, Haider 1986, Grewendorf 1988, Webelhuth 1992, Vikner 1995, Büring 1996, Müller 1999, to name only a few. Nevertheless, since Kayne 1994 proposed the idea of anti-symmetry,

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[27]German has five coordinating conjunctions (*aber* 'but', *denn* 'because (of)', *oder* 'or', *sondern* 'but on the contrary', *und* 'and'), which connect two main clauses such that each one has Verb Second.

[28]On the exact structural integration of the finite auxiliary (and modal), see section 3.5.

followed by the 're-analysis' of the Germanic languages by, for example, Zwart 1993, Zwart 1997, Hoekstra 1997, Hinterhölzl 2000, Koopman & Szabolcsi 2000, it is not so uncontroversial anymore to assume a [complement - head] -order in the German VP. At the same time, there is still a strong party in defense of the earlier view, see in particular Haider 1993, 2000, Haider & Rosengren 1998, Büring & Hartmann 1997a, b, Vikner 2001, Morimoto 2002, Bobaljik 2002a.

The current goal is not to prove that a [head - complement]-analysis can by no means be the correct approach to the German verb phrase, or that a [complement - head]- analysis is. Rather, the goal is to *explain* the possibility of a head-final directionality in combination with a preference for the reverse elsewhere. That is, the goal is to provide the theoretical grounds to understand why this particular kind of directionality *is* a valid option granted by universal grammar (while others are not). The overall proposal as such offers a new conceptual justification of the standpoint that the German verb phrase is head final. As noted in the introductory chapter, the point is not so much that we couldn't derive grammars like German and Tzotzil within a purely LCA-based approach. The point is that we are then still left with the question of why universal typology includes precisely these kinds, but not other logically possible alternatives.

That said, I will, at this point (see also the discussion in section 5.1) address one aspect of the discussion. As Hinterhölzl 2000:§2.3 observes, a strong argument in favor of a [head - complement] -analysis for German is the fact that manner adverbs such as *sorgfältig* 'carefully', *genau* 'exactly', *gut* 'well', *schlecht* 'badly', in many contexts, intervene between the (definite or indefinite) object and the verb. Under the assumption that manner adverbs have to be adjoined to VP, this indicates that the object must have left its VP-internal base position in any case, so the assumption of a post-verbal base position is empirically harmless:

(45)   German (cf. Hinterhölzl 2000:304):

a.   ..., weil Hans$_S$ [das Buch/ein Buch]$_O$ **sorgfältig** gelesen$_V$ hat$_{Aux}$

             since Hans   the book / a   book   carefully   read   has

        "... since Hans has read the book/a book carefully."

b. $^{??}$..., weil Hans$_S$ **sorgfältig** [das Buch/ein Buch]$_O$ gelesen$_V$ hat$_{Aux}$

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At the same time, Hinterhölzl admits in footnote 3 that (b) in fact yields a perfectly grammatical sentence, but it has a different interpretation ("it was careful of Hans to read the book"). Note in the following example that we can obtain a distinction between a generic and an existential reading of the bare plural *Bücher* 'books', by placing the adverb either in a pre- or post-object position:

(45)　German:

    a.　　…, weil Lola$_S$ Akten$_O$ **sorgfältig** liest$_V$.

       since Lola　files　carefully　reads　　　　　　　GENERIC reading

      "… since with respect to files, Lola reads them carefully."

    b.　　…, weil Lola$_S$ **sorgfältig** Akten$_O$ liest$_V$.

       since Lola　carefully　files　reads　　　　　　　EXISTENTIAL reading

      "… since Lola is reading files carefully."

We will come back to the distinction between existential and generic readings in section 3.5.1 (with specific discussion of Diesing 1992). At the moment, we want to emphasize that the object *can* surface after the manner adverb. It is just that there is a potential to impose meaning differences on the distinct ordering. Furthermore, as pointed out by Hinterhölzl himself, in idiomatic expressions, the object strongly *prefers* to follow the manner adverb; see an example in (46). The same holds for directional PP-complements (which are here assumed to be linked below a THEME-object; cf. (3) in 2.1); this is illustrated in (47) (other PP-complements can either follow or precede, without meaning differences):

(46)　German:

    a.　　…, weil er$_S$ ihr diesmal sehr **sorgfältig** einen Bären$_O$ aufgebunden$_V$ hat$_{Aux}$

       since he　her　this-time　very　carefully　a　bear　tied-on　　has

      "… since he has fooled her very carefully this time."

    b.　　*…, weil er$_S$ ihr diesmal einen Bären$_O$ sehr **sorgfältig** aufgebunden$_V$ hat$_{Aux}$

(47)   German:

    a.   ..., weil sie_S **schnell** [_PP_ auf den Stuhl] gestiegen_V ist._Aux

            since she   fast   on   the   chair   climbed   is

        "... since she climbed on the chair fast."

    b.   *..., weil sie_S [_PP_ auf den Stuhl] **schnell** gestiegen_V ist._Aux.[29]

Now, Hinterhölzl explains the different orders by distinguishing multiple landing sites for the objects and PPs: [_TP_ T^0 [specifics [_oft_ [Neg [Focus [AgrNom [AgrDat [AgrAcc [_manner adverb_ [_PredP_ $Pred^0$ [_VP_ V^0 ....]]]]]]]]]]]] (cf. Hinterhölzl 2000:309, 311; with PredP the landing site for idiomatic expressions and directional PPs). While this is certainly a valid approach, there seems to be a much simpler solution, which, over the course of this dissertation, will find further support (see in particular the discussion in chapter 3, 3.5.1, as well as in chapter 4 on the distribution of adjectives in noun phrases). This solution is, following Haider & Rosengren 1998:55, to allow (a), adverbs to be adjoined to either VP or V-bar (as well as _v_P or _v_-bar), and to allow (b), for a potentially _variable_ adjunction site for particular adverbs.

    Such variability seems empirically suitable for German especially in light of examples like the following. In (48a) and (b), the bare plural object _Fragen_ 'questions' is squeezed between the two manner adverbs _gut_ 'well' and _schnell_ 'fast'. In (a), it is _gut_ that leads the sequence, while in (b), it is _schnell_. There is no way to derive both clauses without allowing _gut_ and _schnell_ to take two different positions in the syntax:

(48)   German:

    a.   ..., weil Lola_S **gut** Fragen_O **schnell** beantwortet_V.

            since Lola   well   questions   fast   answers

        "... since Lola does it well to answer questions fast."

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[29]The current order is in fact also possible if _schnell_ is stressed. We can then obtain a contrastive reading, in a context like "she climbed on the chair FAST – not slowly".

b.   ..., weil Lola$_S$ **schnell** Fragen$_O$ **gut** beantwortet$_V$.

              since Lola   fast   questions well answers

          "... since Lola is fast in answering questions well."

I wish to highlight that giving adverbs the freedom to either adjoin to an XP- or to an X-bar-node, and to furthermore allow one grammar to exploit both options, is more than just a convenient way to open the door for a simpler structure. We have to keep in mind that adverbs have syntactically quite a different status than arguments. Only the latter are governed by the thematic hierarchy, which can force two arguments into a particular relative order at least in terms of base generation. There is no such pressure between an argument and an adverb. Two different kinds of adverbs might be bound by an *adverbial* hierarchy (cf. Cinque 1993, 1999), such that, for example, manner adverbs cross-linguistically occur low in the syntactic tree, but it is an independent question of whether grammars in fact enforce a particular way of syntactically representing this hierarchy and whether they tie a specific adverb cross-linguistically to one particular position. Recognizing that adverbs do not participate in thematic linking, one might rather expect that grammars allow for some greater leeway in this domain. This opens a door to inducing meaning distinctions (by different scope relations) in the most economic way, without burdening the syntax with an extra movement operation.[30]

Returning to head-final verb phrases with an otherwise [head - complement]-grammar, German (and some of its Germanic siblings) is not the only language that shows this kind of mixed directionality. Another example is Persian based on the structural description by Karimi 1994, Ghomeshi 1996, 1997. Here, the contrast of the (surface) head orientation is even more obvious than it is in German, since Persian has no Verb Second. (49) illustrates the basic 'subject - object - verb'-order of declarative transitive clauses. (50) gives a first glance at the elsewhere preferred left-orientation of X^0: adpositions are prepositions (cf. (50a)), and

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[30]Be aware that the general left-orientation of the adverbs across different contexts follows from the strength of BRANCHING RIGHT. See more on this below. On the point that adverbs are not forced into a unique base position by thematic hierarchy or alike, see also Ernst 2002 who likewise adopts the hypothesis that adverbs can have multiple base positions and who proposes a theory of adverbial distribution which correctly predicts the possible positions of any adverbial (with a given interpretation) in any given sentence.

complementizers such as the declarative *ke* 'that' precede their complement (cf. (b)).

(49)   Persian (cf. Karimi 1994:50):

man$_S$ ketâb-o$_O$ mixunam$_V$.

  I   book-râ   read

"I read the book."

(50)   Persian (cf. Karimi 1994:50, 52):

a.   man$_S$ [$_{PP}$ **bâ** sâsân]   raqsidam$_V$ b.   ... **ke** [sepide$_S$ pirhan$_O$ xarid$_V$].

      I   with Sasan   dance   that Sepide   shirt   bought

      "I dance with Sasan"   "... that Sepide bought shirts."

Let us then investigate how the system explains the possibility of a grammar which projects a [complement - head]-order inside the lexical verb phrase but [head - complement] elsewhere. The claim is that in all contexts in which the verb does not leave the lexical layer (see chapter 3 for derivation of this aspect in all clauses in Persian, in all non-Verb Second contexts in German), 'S - O - V'-order is the result of electing the 'right-peripheral head'-choice as the optimal resolution in the conflict of HEAD LEFT/RIGHT, LEX HEAD EDGE, BRANCHING RIGHT and GENERALIZED SUBJECT. Under exactly which rankings, then, is the 'right-peripheral head'-choice the optimal one?

2.5.2   How heads can be final in the verb phrase alone

The 'right-peripheral head' choice is the choice of satisfying LEX HEAD EDGE by projecting a lexical head on the right of both complement and specifier. In a [$_{LexP}$ [complement Lex^0]]-configuration, the specifier can be aligned left-peripherally, and the entire lexical projection still obeys LEX HEAD EDGE. For LEX HEAD EDGE, it doesn't matter if the head is at the left or the right edge of LexP, as long as it surfaces at *some* edge. The only harmonic disadvantage of the structure is that it violates HEAD LEFT, which makes it a marked choice in a language with HEAD LEFT >> HEAD RIGHT-ranking. Any such grammar would usually prefer to obey HEAD LEFT rather than HEAD RIGHT. Thus, it would usually prefer to have the head left of its complement. Let us have another look at the 'right-peripheral head'-choice whose harmonic advantage is the

accomplishment of obeying LEX HEAD EDGE, BRANCHING RIGHT, GENERALIZED SUBJECT and HEAD RIGHT all at once:

(51)   The 'right-peripheral head'-choice:
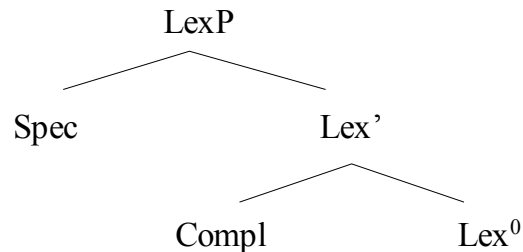
```
                        LexP
                       /    \
                    Spec     Lex'
                            /    \
                        Compl     Lex⁰
```

No violation of LEX HEAD EDGE, BRANCHING RIGHT, GEN SUBJECT, HEAD RIGHT
One violation of HEAD LEFT (for the right-peripheral orientation of Lex^0)

If a language ranks HEAD LEFT >> HEAD RIGHT, the only chance that it ever uses the 'right-peripheral head'-choice is to have not only LEX HEAD EDGE ranked above HEAD LEFT, but also GENERALIZED SUBJECT and BRANCHING RIGHT. The claim is that the mixed word order of SOV-languages such as German and Persian corresponds to a certain degree of underlying non-uniformity, caused by one of the following ranking-options:

(52)   Type C – SOV in a [head - complement]-oriented grammar, German, Persian:
         LEX HEAD EDGE, BRANCHING RIGHT, GENERALIZED SUBJECT >> HEAD LEFT   &
         HEAD LEFT >> HEAD RIGHT

Let us first see how the ranking derives the head-finality of *v*P. The tableau under (53) considers once more the competition, this time under a type C ranking. Here, the 'right-peripheral head'-candidate (c) for ordering *v*P wins over both the 'right-peripheral specifier'-candidate (a) and the 'head movement'-candidate (b). The shortcoming of (a) is its violation of BRANCHING RIGHT; (b), on the other hand, violates GENERALIZED SUBJECT. (d), the head-medial VP with left specifier and right complement, fails on LEX HEAD EDGE:

(53)   German:[31]

..., dass [$_{vP}$ [der Butler]$_S$ [$_{v'}$ [die Gräfin]$_O$ küsste$_v$]].

          that   the butler   the countess   kissed
"... that the butler kissed the countess."

'Optimal SOV' by ranking HEAD LEFT >> HEAD RIGHT below the rest:

	LEX HD EDGE	GEN SUBJECT	BRANCH RIGHT	HEAD LEFT	HEAD RIGHT
a. [$_{vP}$ [$_{v'}$ v^0 object] subject]: VOS			*!		*
b. [$_{vP}$ [$_{v'}$ v^0 [$_{vP}$ subject [$_{v'}$ t_V object]]]]: VSO		*!			**
⌐ c. [$_{vP}$ subject [$_{v'}$ object v^0]]: SOV				*	
d. [$_{vP}$ subject [$_{v'}$ v^0 object]]: SVO	*!				*
e. [$_{FP}$ [$_{F'}$ v^0-F^0 [$_{vP}$ subj [$_{v'}$ t_V obj]]]]	*!	*			**

We see that one crucial factor in causing the head-finality of the verb phrase is the existence of a specifier, here hosting the subject (or its copy/trace). The existence of this phrase is forced by the ranking of GENERALIZED SUBJECT. The point is that if it is less costly to violate HEAD LEFT than to dispense with the specifier, then there is no chance for the lexical head to escape the specifier by projecting an additional lexical shell and moving the verb to the left (i.e. the 'head movement'-choice). Given that BRANCHING RIGHT is also important to obey, there is also no chance to switch the specifier to the right. Consequently, there is only one way to obey LEX HEAD EDGE, that is, by switching the head directionality.

Let us pause here for a second, to emphasize the following. In a default transitive context, it is indeed the existence of the nominative (or ergative) case marked subject, carrier of the subject-2-role such as AGENT, which ensures, either by its surface occupation of the verb's

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[31]Even if one assumed that the subject *der Butler* has moved out of *v*P, the output would still be a head-final *v*P. Imperative is the assumption that any *v*P or VP contains at least a specifier-trace, in order to push the lexical head to the right edge (cf. the introduction of LEX HEAD EDGE in section 2.2). Keep in mind that we are presently ignoring the inflectional layer, which is discussed in chapter 3.

specifier, or by its movement through this specifier (leaving a copy/trace), the head-finality of the verb phrase. Note on the second option that even if the subject does not move into the inflectional layer, in complex verb constructions, it might move into the VP of a second verb, as such successively pushing both verbal heads to the right and yielding a clause final verb cluster (see section 3.5.2 for details).

Nevertheless, we have to keep in mind that it does not need to be the actual grammatical subject of the clause which causes a right-orientation of the clause's verbal head(s). GENERALIZED SUBJECT, as noted in its introduction, is not about a specific type of subject but rather it is about providing a *syntactic specifier position* regardless of what fills it. Imagine therefore a context without a subject-2-role, or a VP without any *v*P-layer, and the VP contains nothing but an object in complement position. The pressure of GENERALIZED SUBJECT will force this object to move into the specifier, as such ensuring satisfaction of the constraint. This yields head-finality as long as the verb doesn't leave that VP.

GENERALIZED SUBJECT is literally *general*, meaning that it cares only about the provision of a position for a subject, i.e. a specifier, but is little concerned about the actual content of that specifier. It is precisely for that reason that VPs in type C can be head-final even in the absence of a nominative/ ergative case marked subject or in the absence of an argument with a subject-2-role. On some level, GENERALIZED SUBJECT is about the prioritization of the subject over the object. That is, we have recognized before that, by the strength of HEAD LEFT and HEAD RIGHT, single arguments are linked into complement position. So, in terms of head alignment it is better to create an object position first, before creating any specifier. GENERALIZED SUBJECT however pushes in the opposite direction. Here, it is better to create a specifier, hence a subject position, regardless of whether there is a complement or not.

This result is by no means that puzzling: Arguments carrying an object-2-role sometimes indeed become surface subjects. The most common case that comes to mind are unaccusatives with the THEME argument receiving nominative case; see section 5.3 for discussion. In German, we even find cases in which a dative-case-marked object steps up to be the thematically highest argument in the clause such that we might call it the grammatical subject (see 5.3 for discussion as well).

Finally, I wish to point out that there might be one potential problem with the above reasoning, which concerns the analysis of impersonal passives in German. Impersonal passives constitute a subset of passive configurations, in which an unergative verb is passivized, resulting in the suppression of the external argument much as in transitive passives. But since the verb is unergative, there is no internal argument, meaning that, at least overtly, no arguments are present. Nevertheless, the auxiliary *werden* 'will', which is obligatory in passives in general, as the *be*-auxiliary is in English passives, surfaces in the final position in its projection. Now, in chapter 3, we will see that the German finite auxiliary in fact occupies a clause-final T-head in non-Verb Second contexts. But significantly, *werden* cannot be equated with T in all contexts. For example, in present perfect tense, T is occupied by an additional finite auxiliary, and *werden*, in participle form, is still obligatory and final in its projection. That is, we get the surface order 'main-V-past participle - worden$_{participle}$ - T'. This is illustrated in (54b). Note here also that the past participle form of *werden* occurring in passive constructions differs from the past participle form occurring elsewhere: the former is just *worden*, elsewhere, we get *geworden*, with the *ge-*prefix, which is obligatory in all other formations of past participle throughout the grammar. (54a) shows a simple past example, with 'main-V-past participle - (finite form of) *werden*':

(54)   German:

     a.   ..., weil hier geraucht wurde.

          since here   smoked   will-PASSIVE-PAST

          "..., since one smoked here."

     b.   ..., weil hier geraucht worden   ist.

          since here   smoked   will-PASSIVE-PART is

          "..., since one has smoked here."

Hence the question is, what is the projection of *worden* and what is in its specifier? I will leave the question for further research, for the following reasons. First, there is something irregular happening in the morphology of the *werden* passive participle; second, passive configurations are the only verbal constructions in German in which there is the possibility of having, on the surface, not even one single argument present. Elsewhere, German is particularly strict in the

necessity of putting up at least one argument. Even 'weather' verbs, which seemingly thematically lack a 2-role, and can, as such, appear in many languages completely 'stripped' in the syntax, require an expletive in German. Compare German in (55) with the 'argument-less' verb from Icelandic in (56).

(55) German:

    a.   ..., weil **es** regnet.   b.   *...., weil regnet.

          since it   rains

          "..., since it rains."

(56) Icelandic (cf. Bondre-Beil 1994:70):

Rignði?

 rains

"Does it rain?"

Similarly, intransitive active verbs might allow for a semantically vacant expletive subject. Significantly, though, this expletive cannot be dropped:

(57) German:

    a.   ..., weil **es** hier duftet.   b.   ..., weil **es** juckt.

          since it here   smell-good   since it itches

          "..., since it smells good here."   "..., since it itches."

    a'.   *...., weil hier duftet.   b'.   *...., weil juckt.

(58) German:

*..., weil **es** geraucht wurde.

        since it smoked   will-PASSIVE-PAST

"..., since one smoked here."

As illustrated in (58), surprisingly, in passives, that same expletive is impossible to add, even if there is no 'overt' argument. This might indicate that there is in fact an abstract thematic position

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already present, which corresponds to a suppressed external argument, and which, as such, not only bans the insertion of the thematically empty expletive but also pushes the *werden*- verbal head to the right (see here also Baker, Johnson & Roberts 1989 on the syntactic presence of the suppressed external role cross-linguistically). It is important to be aware in this respect that, in active contexts, as soon as a thematically non-empty (nominative case marked) argument is present, then it is likewise impossible to add an expletive. Expletive – associate-constructions are possible in German only in the main clause and seem therefore contingent upon the (contextually- dependent) availability of a particular *functional* specifier (see 3.5.1, 3.5.2 for discussion). Thus, there is an apparent difference in German between, on the one hand, the use of a thematically empty purely 'functional' expletive *es*, and on the other, a thematically empty 'lexical' expletive *es*. The latter comes to the rescue if no argument is present to fill the specifier of the *lexical* verb phrase, and only then, in order to satisfy GENERALIZED SUBJECT in that domain. Since there is more to be understood about the syntax of passive as such, I take this as an indication that the construction at stake does not necessarily undermine the current proposal on German's VP-head-finality; rather, my proposal might offer a tool for further research to advance the understanding of passives in general.[32]

Let us go back to the consequences of a type C ranking. What else does it determine besides the head-finality of the verb phrase if the verb surfaces therein? First, consider once more BRANCHING RIGHT: given that BRANCHING RIGHT is not violated in order to satisfy LEX HEAD EDGE, not only lexical specifiers but also functional ones should preferably precede their sister nodes, as should phrasal adjuncts. This, then explains, why, in German, the Verb Second specifier aligns left-peripherally; and why, recalling the examples seen in (45)-(48), adverbs adjoin on the left, whether to the *v*P-node or lower down inside the verb phrase. On the latter possibility, the assumption that German allows adjunction at a *v*- or V-bar node is compatible with the associated ranking. Be aware that not only a lexical specifier but also a *v*P-internal

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[32]One possible line of approach could be, for example, to investigate whether the *v*P-shell is in fact still projected in German passives, only that (a), *werden* lexicalizes v^0 (instead of the root verb; see Bowers 2002:210 for *be*-insertion into $Pred^0$ (- Bower's equivalent to v^0)), and (b), the specifier is filled by some kind of abstract copy/trace of the suppressed external role.

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adjunct can be a threat for LEX HEAD EDGE, if it hinders a lexical head from surfacing at an edge of a perfect lexical projection. In a head-final verb phrase though, in which the verbal head aligns at the right edge, no threat arises, neither from a specifier nor from an internal adjunct, as long as they both align left-peripherally, which they do in German.

Furthermore, both of our examples of a type C language, German and Persian, are scrambling languages. If scrambling is movement (cf., for example, Büring 1996:5, Haider & Rosengren 1998:5, Müller 1999:780 for German; Ghomeshi 1997:148 for Persian), then it is movement to the *left*. Given the strength of BRANCHING RIGHT, this is clearly expected, since leftward movement results in a left-peripheral adjunct (or specifier), which obeys BRANCHING RIGHT, as opposed to rightward movement. Given BRANCHING RIGHT, leftward scrambling is expected to be the default.[33]

But, now, how exactly does a type C ranking derive the occurrence of the particular kind of mixed head directionality we have discussed above? Looking at the higher functional projections in a clause, why do they have [head - complement]-order, where this linear organization is independent of the presence or absence of an adjoined lexical head?

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[33]This doesn't mean BRANCHING RIGHT couldn't be violated in a grammar like type C; it still could if an independent higher ranked constraint forces right-alignment. Evidently, this is the case in German extraposition. See Büring & Hartmann 1997a, b for convincing arguments from binding relations that extraposition of clauses is movement to the right, adjoining the clause to the right of I-bar, IP or higher.

In terms of pure word order, the strongest indication that clauses are not base-generated in a right peripheral complement position comes from 'doubly embedded' clauses containing complex verb constructions. In (i) below, the deeper embedded *dass*-clause must follow the last, finite, verb of the embedded *weil*-clause and does not align at the right of the corresponding main verb *überzeugt* 'convinced':

(i)   ..., [weil sie ihn hoffentlich **überzeugt haben wird**] [dass Nebensätze nicht basisgeneriert sind].

           since she him hopefully convinced have   will   that sub-clauses not   base-generated are

       "... since, hopefully, she will have convinced him that subordinated clauses aren't base generated."

(i')   *..., [weil sie ihn hoffentlich **überzeugt** [dass Nebensätze nicht basisgeneriert sind] **haben wird**].

See more remarks on extraposition in chapter 3 (3.5), chapter 5 and chapter 6.

See first how a head-medial FP with a single functional head wins over the head-final alternative. The reason why type C switches from the 'right-peripheral head'-choice to a [head - complement]-configuration is the same as type A's and type B's reason for not switching specifiers or moving heads in functional projections. LEX HEAD EDGE is vacuously satisfied in an FP projected by a simple functional head, and therefore, there is no motive to violate HEAD LEFT, BRANCHING RIGHT, or GENERALIZED SUBJECT. Consequently, type C chooses to violate the lower ranked HEAD RIGHT instead, and the head-medial FP wins:

(59)   'Head-medial' wins over the 'right-peripheral head'-choice in FP:

	LEX HEAD EDGE	GEN SUBJECT	BRANCH RIGHT	HEAD LEFT	HEAD RIGHT
☞ a. [$_{FP}$ spec [$_{F'}$ F^0 compl]]					*
b. [$_{FP}$ spec [$_{F'}$ compl F^0]]				*!	

This choice for [head - complement] instead of [complement - head] remains unaltered in any context that has forced a lexical head to move into the functional projection. As we know by now, LEX HEAD EDGE can never be satisfied inside FP. Thus, if an additional constraint conflict compels a lexical head to surface inside FP, LEX HEAD EDGE is unable to have any impact on the directionality. In chapter 3 (3.5.2), we will discuss German Verb Second as one such context. At present, we just want to recognize that, whichever functional projection the lexical head moves into and whichever cause may drive Verb Second, the target FP is expected to have [head - complement]- order, regardless of the presence of a lexical item inside its head. The point is that both directionalities violate LEX HEAD EDGE, and thus, HEAD LEFT takes over and makes the decision. On the following German example, notice furthermore that an un-pronounced copy of the verb precedes its complement. Since the un-pronounced copy does not violate LEX HEAD EDGE, here too, HEAD LEFT >> HEAD RIGHT determines the order. (On 'separable prefixes', which one might take as evidence that a verbal copy follows its complement, see section 5.4).

(60) German:

[FP [Die Gräfin]S verehrte$_{v-F}$ [$_{vP}$ t_S t_V [den Butler]O]]

    the countess admire-PAST   the butler

"The countess admired the butler."

No 'right-peripheral head'-choice in FP, even if a lexical head is involved:

	LEX HEAD EDGE	GEN SUBJ	BRANCH RIGHT	HEAD LEFT	HEAD RIGHT
L a. [FP spec [F' Lex^0- F^0 complement]]	*				*
b. [FP spec [F' complement Lex^0- F^0]]	*			*!	

Hence, type C makes a systematic cut between the lexical and the functional domain, just as type A does. In type A, the cut concerns the directionality of the specifier: a lexical projection that contains its head has a right specifier, but functional projections consistently have left specifiers, no matter what the head contains. Type C makes a parallel cut concerning the directionality of the head: lexical heads surfacing in their lexical domain are on the right of their complement, but functional heads are on the left, independent of what else is adjoined to them. Notice that type A, which allows an ordering variation for the specifier, consistently projects left-peripheral heads. Type C, on the other hand, accepting an ordering variation for the head, has systematically left-peripheral specifiers. Both types pick *one* domain of variation, leaving the other domain 'uniform'. We will soon come back to this point, in section 2.5, where we will discuss the system's derivation of impossible patterns.

Altogether, recognize that the introduction of LEX HEAD EDGE really imposes a certain bi-directional connection onto type C, a connection between V surfacing inside VP, and V following its complement. Satisfaction of LEX HEAD EDGE involves being inside its own lexical domain. Consequently, the fine print of the system is not so much that type C-VPs are head-final, but rather that (a), a verbal head (and in general a lexical head) which follows its complement must be inside vP/VP (LexP); and (b), a verbal head which precedes its complement must be outside vP/VP, in a functional projection.

Finally, be aware that just as any FP of a verbal extended projection is expected to have [head - complement]-order in type C, so will any FP in a non-clausal extended projection. This is why type-C languages have prepositions, left-peripheral determiner heads and so on (see more on German adpositions in section 5.4). In addition, we will see in chapter 4 why even the *lexical* noun phrase has consistently [head - complement]- order. As one might suspect, the reason lies in the fact that nominal extended projections do not constitute clauses, and thus, even if Spec, NP is possible, it is not demanded by any structural constraint; that is, GENERALIZED SUBJECT is silent. As a result, a type C-grammar is able to escape a head-medial NP by leftward noun movement, and there will be no motivation for the 'right-peripheral head'-choice inside NP. For more on German adjectival extended projections, and whether they constitute clauses, see sections 5.1-5.2.

In general, the ultimate prediction is that type C allows for right-peripheral lexical heads in clauses, but non-clausal lexical heads precede their complement. We can summarize the core properties of type C as follows. Once again, the claim is that these properties are essential for causing the mixed word order visible in languages like German and Persian:

(61) Core properties of type C:
    i.   Specifiers and adjuncts align left-peripherally.
    ii.   Any *v*P (and VP) has a specifier (possibly a copy/trace).
    iii.   In clausal projections: a lexical head which surfaces inside a lexical shell *follows* its complement; we have [complement - head]-order.

               Basic 'S - O - V', then, corresponds to a head-final *v*P containing the verb in a head position which is right of its complement.

    iv.   A verbal head which surfaces in a position that *precedes* the corresponding complement is inside a *functional* projection.
    v.   Non-clausal lexical projections have [head - complement]-order.
    vi.   Functional projections have [head - complement]-order.

We have now discussed all three *mixed* types predicted by the system, and we have recognized that they all share the same crucial involvement of LEX HEAD EDGE, only in different ways. Let

us next see how the system derives grammars with cross-categorical uniformity.

2.6   Predicting cross-categorical uniformity

One of the main objectives we set in the beginning was the following. We wanted to explain the possibility of a *restricted* set of mixed word order cases *without* losing the account of languages that order their phrases uniformly across different categories. Aiming for a restricted overall typology has not only the advantage of avoiding the derivation of too many unattested patterns; it also matches more accurately the fact that a high percentage of the world's natural languages do have uniform directionality (cf. Greenberg 1963, 1966, Dryer 1992, Hawkins 1988). The more distinct types a typology includes, the more the existence of a uniform language becomes an accident. This should make us start wondering if our theory could possibly be right, given that there are so many languages that pattern in these ways.

Now, the outlined objective had a sub-clause: following the early parameter-approach (cf. Chomsky 1981) and its Optimality theoretic development (cf. Grimshaw 1997, 2001), the system should predict two kinds of uniform languages, that is, a uniform '[spec [head - complement]]'-grammar, and a uniform '[spec [complement - head]]'-grammar. Acknowledging a pair, instead of just one possible underlying form '[spec [head - complement]]', has the advantage of allowing us to analyze uniform 'subject - verb - object'- (SVO) languages (such as, English, French, Mainland Scandinavian...) and uniform 'subject - object - verb'- (SOV) languages (such as Japanese, Korean, Turkish, Basque....) as simple mirror images of each other within X'-projections. We can say that they differ in only one structural respect, the order of head and complement.[34]

Let us see how the system succeeds in predicting these two language types. We are aiming for a type D language which prefers a [spec [head - complement]]-directionality in both the lexical and the functional domain; and a type E language which favors a

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[34]We don't need to find *several* different movement triggers in order to derive the complete surface order that classifies a uniform SOV-language (e.g. a trigger for remnant VP-movement, for IP-movement to CP, Spec, for noun-movement or remnant NP-movement, for NP-movement to PP, Spec etc.). Recall that this opens a backdoor for over-generalization. It furthermore adds back on explanatory baggage one might wanted to avoid through the assumption that there exists only one possible underlying form.

[spec [complement - head]]-order for both the lexical and the functional domain. Notice that both types not only share the aspect that they are uniform with respect to the order of head and complement. This, actually, is also true for the two mixed types A and B. The uniform types furthermore share a uniform treatment of specifiers (and adjuncts), which are preferably on the left of their sister nodes in both grammars. They also both lack systematic fronting of the verb past the subject.

Significantly, the system {LEX HEAD EDGE, GENERALIZED SUBJECT, BRANCHING RIGHT, HEAD LEFT, HEAD RIGHT} shows a particular contrast in how to derive type D vs. type E, which has an impact on the totality of types predicted. This desirably minimizes the options, as we will prove shortly in the next section (2.7). Let us think first about type D.

2.6.1 Uniform SVO

Type D will generally favor [head - complement]-orders if and only if HEAD LEFT >> HEAD RIGHT. Furthermore, going back to the *v*P-competition, we must ensure that the *head-medial v*P, with left specifier and right complement, is more harmonic than each of the three choices that would yield a grammar with mixed word order. That is, we want the $[_{vP}$ spec $[v^0$ complement]]-configuration to win over the 'right-peripheral specifier'-choice, the 'head movement'- and the 'right-peripheral head'-choice:

(62)   The 'uniform [spec [head - complement]]'-choice:

```
                    LexP
                   /    \
                Spec     Lex'
                        /    \
                     Lex⁰     Compl
```
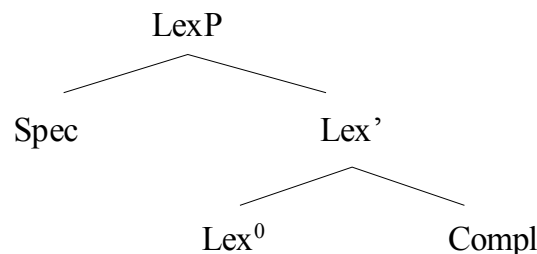
No violation of BRANCHING RIGHT, GEN SUBJECT, HEAD LEFT
One violation of HEAD RIGHT (for the left-peripheral orientation of Lex^0)
One violation of LEX HEAD EDGE (for the missing edge alignment of Lex^0)

If type D prefers a head-medial configuration inside *v*P, it will do so anywhere else as well, in contexts which violate LEX HEAD EDGE, and in those that do not. The result is a uniform SVO-language. Altogether, then, the claim is that languages like English have one of the ranking options given in (63). The triple {GEN SUBJECT, BRANCH RIGHT, HEAD LEFT} must be ranked above LEX HEAD EDGE, and HEAD LEFT must be ranked above HEAD RIGHT:

(63)   Type D – Uniform SVO, English:
        HEAD LEFT, BRANCHING RIGHT, GENERALIZED SUBJECT >> LEX HEAD EDGE   &
        HEAD LEFT >> HEAD RIGHT

For a brief demonstration, compare the two tableaux in (64) and (65) below. First, regarding the *v*P-competition in (64), it is now candidate (d), the head-medial *v*P with left specifier and right complement, which beats the three competitors (a), (b) and (c), despite the fact that (d) has a shortcoming with respect to LEX HEAD EDGE. The 'right-peripheral specifier'-candidate (a) fails on BRANCHING RIGHT, the 'head movement'-candidate (b) loses over GENERALIZED SUBJECT, and the 'right peripheral head'-choice (c) goes under due to its HEAD LEFT violation.

Furthermore, as insinuated in the English example English will be recognized as an SVO-grammar which moves the subject into the inflectional layer, but not the verb (see chapter 3). Despite the fact that the verb thus surfaces inside a lexical projection, the [spec [head - complement]]-directionality is maintained:

(64)   English:
             ..., that [the butler]$_S$ [$_{vP}$ t_{Subj} cherishes$_v$ [the countess]$_O$].

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'Optimal SVO' by ranking LEX HEAD EDGE low:

	HEAD LEFT	GEN SUBJECT	BRANCH RIGHT	LEX HD EDGE	HEAD RIGHT
a. [$_{vP}$ [$_{v'}$ v^0 object] subject]: VOS			*!		*
b. [$_{vP}$ [$_{v'}$ v^0 [$_{vP}$ subject [$_{v'}$ t_V object]]]]: VSO		*!			**
c. [$_{vP}$ subject [$_{v'}$ object v^0]]: SOV	*!				
☞ d. [$_{vP}$ subject [$_{v'}$ v^0 object]]: SVO				*	*

Similarly, any FP-competition, such as the one in (65), picks the head-medial configuration (d), over the 'right-peripheral specifier'-candidate (a), the 'head movement'-candidate (b), and the 'right-peripheral head'-choice (c). (a), (b), (c) all fail for the same individual reasons as they did inside *v*P:

(65)   English:

[$_{CP}$ What have**Aux-C** [you done...]]?

[spec [head - complement]] *also* wins in FP:[35]

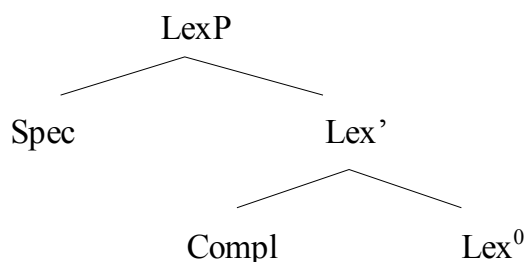|	HEAD LEFT	GEN SUBJECT	BRANCH RIGHT	LEX HD EDGE	HEAD RIGHT
a. [$_{FP}$ [$_{F'}$ F^0 complement] spec]			*!		*
b. [$_{FP2}$ [$_{F'}$ F^0 [$_{FP1}$ spec [$_{F'}$ t_F comp]]]]		*!			**
c. [$_{FP}$ spec [$_{F'}$ complement F^0]]	*!				
☞ d. [$_{FP}$ spec [$_{F'}$ F^0 complement]]					*

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[35] If a lexical head is forced to adjoin to the functional head (considering the data example, one could for example argue that the English auxiliary has the status of a lexical head; though see chapter 3), then, the winning candidate would have an additional LEX HEAD EDGE -violation. This wouldn't change the optimal choice.

Let us recapitulate what we have seen in the previous sections. *Outside* the lexical domain, type A generally gives up on the 'right-peripheral specifier'-choice, type B does so for the 'head movement'-choice, and type C for the 'right-peripheral head'-choice. Putting it all together, we can conclude the following. Concerning the directionality outside the lexical domain, not only do all three mixed types share one structural favorite, but they select the structure which is favored by type D all along. All four types, A, B, C and D, select head-medial FPs with left specifiers and right complements, all of them generally prefer left-peripheral adjuncts, and only inside the lexical domain do they disagree with respect to their optimal choices. All four types also coincide with respect to the ranking HEAD LEFT >> HEAD RIGHT. It is in this sense, that we can identify the lexical domain as the domain in which marked word order patterns can emerge. The functional domain, on the other hand, is the domain of unmarked directionality.

2.6.2   Uniform SOV

Finally, what about uniform SOV-languages and type E? Here, we see a preference for [complement - head]-orders not only inside *v*P, but everywhere. Obviously, such a general favoritism is given if and only if HEAD RIGHT >> HEAD LEFT. Consider the following LexP, which matches the 'right-peripheral head'-choice of type C:

(66)   The 'uniform [spec [complement - head]]'-choice = the 'right-peripheral head'-choice:

```
                    LexP
                  /      \
              Spec        Lex'
                        /      \
                    Compl       Lex⁰
```

       No violation of LEX HEAD EDGE, BRANCHING RIGHT, GEN SUBJECT, HEAD RIGHT
       One violation of HEAD LEFT (for the right-peripheral orientation of Lex⁰)

Choosing a configuration in which the lexical head is on the right of its complement *and* the specifier is on the left of its sister clearly satisfies HEAD RIGHT. However, aligning the specifier on the other side would also satisfy HEAD RIGHT, as long as we do not change the relative order of head and complement. Nevertheless, the key point is that the specifier's left-peripheral alignment not only guarantees satisfaction of HEAD RIGHT, but furthermore it enables obedience to BRANCHING RIGHT, GENERALIZED SUBJECT and LEX HEAD EDGE all together. The same would not be the case for a right-peripheral alignment of the specifier. Not only would this violate BRANCHING RIGHT, but also LEX HEAD EDGE (given that the head is on the right of its complement). Finally, if LEX HEAD EDGE is already satisfied in (66), there is no reason to move the head out of the configuration into a specifier-less lexical projection and risk a GENERALIZED SUBJECT violation. What we see here is that any grammar with HEAD RIGHT >> HEAD LEFT - ranking has an easy ride with respect to satisfaction of all three additional constraints that are in the system so far. As long as type E aligns specifier and adjuncts left-peripherally, it is in the best position to combine its preferred head-orientation with obedience to BRANCHING RIGHT, GENERALIZED SUBJECT *and* LEX HEAD EDGE. Therefore, given the current set of constraints, the prediction is that a type E with HEAD RIGHT >> HEAD LEFT ranking prefers [complement head]-orders everywhere and aligns specifiers and adjuncts left-peripherally everywhere, regardless of the ranking of BRANCHING RIGHT, LEX HEAD EDGE and GENERALIZED SUBJECT. The claim, then, is that a uniform SOV-language such as Japanese (or Turkish, Korean etc.) is given as soon as the ranking is HEAD RIGHT >> HEAD LEFT.[36]

(67)   Type E – Uniform SOV, Japanese:
        HEAD RIGHT >> HEAD LEFT;
        with BRANCHING RIGHT, GENERALIZED SUBJECT, LEX HEAD EDGE ranked anywhere

For a short demonstration, consider the tableau in (68) below which shows a *v*P-competition under the type E-ranking. We see that the optimal candidate is (c), the 'right-peripheral head'-

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[36]Here, I abstract away from the fact that, under a more exact reading of BRANCHING RIGHT, its ranking *is* distinctive in a HEAD RIGHT >> HEAD LEFT -grammar. This will lead to the derivation of yet another mixed type (once we introduced one further constraint, CASE LEX, in chapter 3). See chapter 6.

choice; (c) only violates HEAD LEFT but neither BRANCHING RIGHT nor GENERALIZED SUBJECT nor LEX HEAD EDGE (the example is provided by Koichi Nishitani).

(68)   Japanese :[37]

[$_{vP}$ Watashi-wa$_S$ [$_{NP}$ [$_{PP}$ ku-koozoo -ni-kansuru$_P$] sotsugyoo-rombun-wo$_N$]$_O$ **kaku$_v$**]
        I   phrase structure   about   graduate-essay   write
        "I write a thesis about phrase structure."

'Optimal SOV' by ranking HEAD RIGHT >> HEAD LEFT:

	HEAD RIGHT	HEAD LEFT	BRANCH RIGHT	GEN SUBJECT	LEX HD EDGE
a. [$_{vP}$ [$_{v'}$ v^0 object] subject]: VOS	*!		*		
b. [$_{vP}$ [$_{v'}$ v^0 [$_{vP}$ subject [$_{v'}$ t_V object]]]]: VSO	*!*			*	
☞ c. [$_{vP}$ subject [$_{v'}$ object v^0]]: SOV		*			
d. [$_{vP}$ subject [$_{v'}$ v^0 object]]: SVO	*!				*

Type E picks the same winner as type C did. The only difference is that type E will make the [complement - head]-choice in any other XP as well, on the basis of HEAD RIGHT >> HEAD LEFT. Thus, uniform SOV-languages like Japanese not only have a head-final verb phrase, but, for example, adpositions are post-positions and nouns follow their (PP-)complement, as illustrated in the object argument in the Japanese example in (68).

Furthermore, if XP contains a specifier or an adjunct, type E will align that specifier or adjunct left-peripherally. For type E, inside *and* outside the lexical domain, right-peripheral alignment incurs a violation of BRANCHING RIGHT without harmonizing the structure in any other way (that is, to be precise, not concerning the current set of constraints). Consequently, left-peripheral alignment is optimal.

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[37]On the Japanese example, once more, keep in mind that we are currently ignoring the inflectional layer.

Finally, compare the ranking of type D and type E. We have seen that both uniform types differ from each other only with respect to the order of head and complement, while sharing their linear organization of specifiers and adjuncts. This asymmetric aspect of the system is due to the singleness of BRANCHING RIGHT, which has no opposite correspondent like HEAD LEFT has in HEAD RIGHT. Now, importantly, the existence of LEX HEAD EDGE, in combination with BRANCHING RIGHT, HEAD LEFT and HEAD RIGHT imposes a particular structural pressure on any HEAD LEFT >> HEAD RIGHT -grammar, but it doesn't do so in a HEAD RIGHT >> HEAD LEFT -language. The central point, then, is that, in the absence of equivalent power over a HEAD RIGHT >> HEAD LEFT -constellation, LEX HEAD EDGE -re-ranking does *not* create any additional mixed word order type. This, together with the overall architecture of the system – which allows only the most *minimal* ways of resolving the conflict infected by LEX HD EDGE – results in the system's exclusion of further, unattested, mixed types. Let us now demonstrate this point more systematically.

2.7   What is excluded

Let us recapitulate for a moment the general characteristics of the uniform and mixed word order cases that the system predicts, focusing on verbal extended projections (= clauses):

(69)   The proposed system allows:

i.   Uniform [spec [complement - head]]-directionality (type E – uniform SOV)

ii.   Uniform [spec [head - complement]]-directionality (type D – uniform SVO)

iii.   Grammars which project in a clause *right*-peripheral *lexical* heads and *left*-peripheral *functional* heads; specifiers and adjuncts are always on the left
(type C – Germanic OV, Persian...)

iv.   Grammars with *right*-peripheral specs in *lexical* projections and *left*-peripheral specs in *functional* projections; heads, and adjuncts, are always on the left
(type A – VOS, Tzotzil, Malagasy...)

v.   Grammars that systematically move lexical heads to the *left* of a left-peripheral lexical spec; heads, specifiers and adjuncts are always on the left
(type B – VSO, Mixtecan, Greek...)

Logically, and if our objective were to seek symmetry, we could easily extend this typology by adding several 'mirror'-types to the list.

For a start, we could expect a type 'anti-C' with left-peripheral lexical heads and right-peripheral functional heads. From a linguistic perspective, such a type seems extremely odd. Besides Kaynians, who won't even accept the possibility of a right-peripheral lexical head, some analyses axiomatically assume that, while the linear orientation of lexical heads might be variable, the directionality of functional heads is not; rather, functional heads are universally on the left of their complements. See for example Kiparsky 1996:169, or Vikner 2001:143; Sells 2001:114ff derives this universal left-orientation of F by the Optimality theoretic system of alignment constraints he proposes. The current proposal makes a stand *for* the possibility of right-peripheral functional heads. I claim that there is a most adequate line via which to allow them: right-peripheral functional heads are possible if and only if they are projected *above* right-peripheral lexical heads. Left-peripheral functional heads, on the other hand, are possible above both left- and right-peripheral lexical heads. A system so designed can explain the possibility of uniform SOV-languages with right-peripheral functional heads, as well as the occurrence of German-type languages. It also captures Dryer 1992:102's observation that (surface)OV-languages with sentence-initial complementizers exist, but VO-languages with sentence-final complementizers apparently do not. See in this respect also Holmberg 2000, who argues for the need of a system that excludes grammars with left-peripheral lexical but right-peripheral functional heads.[38]

The proposed system predicts the lack of a type 'anti-C'. If it did exist, 'anti-C' would be a grammar which projects functional heads systematically on the right of their complement.

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[38]Homberg, however, differs from the current proposal by accounting for the generalization "if a phrase " is head-initial, then the phrase $ immediately dominating " is head-initial. If " is head-final, $ can be head-final or head-initial". This generalization still does not seem to be absolutely accurate, since it excludes grammars of the Kru-kind, in which $Infl^0$ precedes but C^0 follows its complement (cf. Koopman 1984. This is acknowledged by Holmberg 2000:150, fn.17 himself. See here also chapter 6, which supports Koopman's description). The generalization accounted for by the current system makes the occurrence of right-peripheral functional heads contingent upon the head-finality of the corresponding lexical base. This is true also in the Kru languages, in which the verb phrase is head-final. See chapter 6 for the derivation of the Kru languages by the current system (after adding CASE LEX to the constraint set).

Given the set at hand, {LEX HEAD EDGE, BRANCHING RIGHT, GENERALIZED SUBJECT, HEAD LEFT, HEAD RIGHT}, we can get this outcome only through ranking HEAD RIGHT >> HEAD LEFT. Once we do this, the default is a preference for right-peripheral heads in general, including lexical heads. Now, the only constraint in the set that introduces a further kind of 'directionality pressure' to the lexical domain is LEX HEAD EDGE. Imagine we wanted type 'anti-C' to satisfy LEX HEAD EDGE through aligning lexical heads on the left of their complements. Then, inside the verb phrase, type 'anti-C' must violate either BRANCHING RIGHT or GENERALIZED SUBJECT. This is because the only way to align the verb at the left edge of *v*P is to either switch the specifier to the right (in violation of BRANCHING RIGHT), or to have no specifier (in violation of GENERALIZED SUBJECT). But even if we ranked one or both constraints below all other constraints in the set, we won't succeed in making such a candidate a winner in type 'anti-C'.

The point is that type 'anti-C' must be a HEAD RIGHT >> HEAD LEFT -grammar, in order to ensure right-peripheral functional heads. As such, there is always a more optimal candidate, namely the 'right-peripheral head'-choice, which can satisfy *all* constraints but HEAD LEFT. The problem is that any possible competitor which satisfies LEX HEAD EDGE due to a [head - complement]-order not only violates either BRANCHING RIGHT or GENERALIZED SUBJECT: such a competitor also violates HEAD RIGHT.

(70)   **No way to pick a candidate with head-initial lexical projections if HEAD RIGHT >> HEAD LEFT:**

	LEX HD EDGE	HEAD RIGHT	HEAD LEFT	GEN SUBJECT	BRANCH RIGHT
☞ a. [$_{vP}$ [$_{v'}$ v^0 complement] spec]		*!			*
☞ b. [$_{vP}$ [$_{v'}$ v^0 [$_{vP}$ spec [$_{v'}$ t_V comp]]]]		*!*		*	
L c. [$_{vP}$ spec [$_{v'}$ complement v^0]]			*		
☞ d. [$_{vP}$ spec [$_{v'}$ v^0 complement]]	*!	*			
☞ e. [$_{vP}$ __ [$_{v'}$ v^0 complement]]		*!		*	

Aiming for a type 'anti-C', we cannot give up on HEAD RIGHT >> HEAD LEFT, since the system offers no other way of ensuring that functional heads are systematically on the right. But

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assuming HEAD RIGHT >> HEAD LEFT, there is still no way to get to 'anti-C'. No matter how we rank the constraints, all that we get is type D.[39]

Importantly, this style of reasoning also means that the system does not allow any 'mixed' types which combine a VOS-lexical base, or a strict VSO-lexical base, with a functional layer that has only right-peripheral functional heads. Any type that systematically chooses a [head - complement]-order in the lexical domain, must choose a [head - complement]-order in the functional domain as well, and any type that systematically elects head-final FPs must project head-final LexPs as well. The only bi-polar head-combination that the system allows is a head-final LexP below an FP with [head - complement]-order.

The system also desirably predicts the absence of a mixed word order type that would be the reverse of type A. Why don't we expect a type 'reverse-A' which combines *left*-peripheral *lexical* with exclusively *right*-peripheral *functional* specifiers? Why couldn't there be a language that has a verb phrase with [spec [head - comp]]-order, but aligns all structurally 'higher' phrases (*wh*-phrases, topic, focus) systematically at the *right* periphery? Given the proposed system, we obtain an explanation, based on the interaction of LEX HEAD EDGE and BRANCHING RIGHT.

The impact of BRANCHING RIGHT makes a right-peripheral specifier more marked than the opposite linear orientation. Consequently, given the existence of a better choice, that is, left-peripheral alignment, there is no way to force a specifier onto the right, unless the system contains another harmonic reason to do so. The current constraint set includes only one such cause, LEX HEAD EDGE. But as we have seen many times before, LEX HEAD EDGE applies exclusively to the lexical domain. Hence, given the right ranking, the system can produce right-peripheral lexical specifiers but not right-peripheral functional ones. Therefore, the combination of left lexical and right functional specifiers is out. Indeed, any type that has *only* right-peripheral specifiers is predicted to be impossible as well.

The system furthermore does not include any variant of type B. Type B yields, through leftward head movement out of a [spec [*v* - complement]]-configuration, a strict VSO-order on

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[39]The additional mixed type introduced in chapter 6 (which captures grammars such as the Kru) has a HEAD RIGHT >> HEAD LEFT -ranking, but it is likewise a type that combines right-peripheral lexical heads with left-peripheral functional heads and not vice versa.

the surface. Why is that the only kind of 'head movement'-choice? First, there is no way of obtaining optimality of a *right*ward head movement out of a head-medial *v*P. Obviously, having the lexical head at the right edge of *v*P would likewise satisfy LEX HEAD EDGE, LEX HEAD EDGE being the reason why head movement takes place. Nevertheless, the corresponding candidate is fatally beaten by the alternative which applies leftward head movement. See in tableau (71) how candidate (b), the 'rightward head movement'-choice, fails on its HEAD LEFT violation, not shared by the winner (a):

(71)   No chance for a 'rightward head movement'-choice:

	LEX HEAD EDGE	HEAD LEFT	BRANCH RIGHT	GEN SUBJECT	HEAD RIGHT
∟ a. [$_{vP}$ [$_{v'}$ v^0 [$_{vP}$ spec [$_{v'}$ t_V comp]]]]				*	**
; b. [$_{vP}$ [$_{v'}$[$_{vP}$ spec [$_{v'}$ t_V comp]] v^0]]		*!		*	*

The above tableau evaluates its winner under a type B-ranking. But note that candidate (b) could never win, no matter how we rank the current set of constraints. The same holds for a structure (c), which would result by rightward head movement out of a head-final *v*P. Nor could any attempt (d) of satisfying LEX HEAD EDGE by moving the head to the left of a head-final *v*P ever be optimal. The reason is that all variants of the one 'head movement'-choice which wins under a type B-ranking have a lethal competitor that throws them out no matter what. This is shown in the table in (72) ((72) is not a tableau, because the constraints are not ranked.). It is the 'right-peripheral head'-choice, here represented by candidate (a), which manages to satisfy LEX HEAD EDGE with only one HEAD LEFT violation. All the alternative head movement-structures shown in table (72) share this violation *and* have further violation marks. Consequently, they can never win; under the appropriate ranking, it will be (a) that wins. Elsewhere, (a) will still be able to block the others; if (a) violates too many constraints to win, then certainly, any *worse* alternative will as well. (If one candidate blocks another candidate in such a way that the latter can never win, no matter how one ranks a set of constraints, this is called 'Harmonic Bounding'; see Prince & Smolensky 1993:176ff.):

(72)   No other 'head movement'-choices besides the one that wins in type B

	LEX HEAD EDGE	HEAD LEFT	BRANCH RIGHT	GEN SUBJECT	HEAD RIGHT
) a. [$_{vP}$ spec [$_{v'}$ complement v^0]]		*			
; b. [$_{vP}$ [$_{v'}$ [$_{vP}$ spec [$_{v'}$ t_V comp]] v^0]]		*		*	*
; c. [$_{vP}$ [$_{v'}$[$_{vP}$ spec [$_{v'}$ comp t_V]] v^0]]		**		*	
; d. [$_{vP}$ [$_{v'}$ v^0 [$_{vP}$ spec [$_{v'}$ comp t_V]]]]		*		*	*
original 'head movement'-choice: [$_{vP}$ [$_{v'}$ v^0 [$_{vP}$ spec [$_{v'}$ t_V comp]]]]				*	**

The only head movement-structure that can win against the 'right-peripheral head'-choice is the original one which does not violate HEAD LEFT at all. It is the winner under a type B-ranking.

We should also be aware of the broader generality of the point just made. Comparing, for example, candidate (a) and (c) in (72) above, we see that any combination of 'strategies' to obey LEX HEAD EDGE, – (c) has v already aligned with an edge of the lower vP but still moves v at the edge of the higher vP –, must be less harmonic than one of the choices instantiated by type A, B and C. What we can note here in general is that A, B, and C are the only mixed word order types produced by the impact of LEX HEAD EDGE, because they are the *minimal* ways of obtaining edge alignment in a HEAD LEFT >> HEAD RIGHT -grammar within this framework of assumptions. Together with the fact that a HEAD RIGHT >> HEAD LEFT -grammar can satisfy LEX HEAD EDGE without producing any mixed directionality, the result is a typology which includes only a very restricted set of non-uniform grammars.

There is another benefit to the typology of the proposed system. What about a type that prefers [[comp - head] spec]-configurations, either generally or only in the lexical domain? Such a type would yield the basic word order 'object - verb - subject' (OVS). Now, basic OVS-languages are extremely rare (cf. Dryer 1992:125). There are only a few attested (cf. Derbyshire & Pullum 1981), the most famous of which is Hixkaryana (cf. Derbyshire 1979). Hixkaryana's most common variant order is, however, SOV (cf. Derbyshire 1985:97), and the grammar has throughout a "strongly OV character" (cf. Derbyshire 1985:110). Therefore, it would be a

positive feature for the system to exclude this as a basic order as well. Let us see why it does:

Outside the lexical domain, it is clearly BRANCHING RIGHT which bans right-peripheral specifiers, even in type A. Type A accepts a right specifier only in LexP. However, once a system allows for that possibility, even if it is in a particular domain, why should it obligatorily pair this with a [head - complement]-order? The explanation within the current system is that right-peripheral specifiers are solely acceptable on the grounds of achieving obedience to LEX HEAD EDGE. Head-medial LexPs do not accomplish this per se, be it with 'spec - head - comp'- or with 'comp - head - spec'-order. A lexical projection that corresponds to an 'SVO'-order still has a chance to succeed, under a type D-ranking. The $[_{vP}$ [object v^0] subject]- configuration, in contrast, has no chance, given that it can be blocked by the 'right-peripheral head'-choice under *any* ranking. See the table in (73):

(73) The 'right-peripheral head'-choice harmonically bounds an 'OVS'-base:

	HEAD RIGHT	HEAD LEFT	BRANCH RIGHT	GEN SUBJECT	LEX HEAD EDGE
a. $[_{vP} [_{v'} v^0$ object] subject]: VOS	*		*		
; b. $[_{vP} [_{v'}$ object v^0] subject]: OVS		*	*		*
) c. $[_{vP}$ subject $[_{v'}$ object v^0]]: SOV		*			
d. $[_{vP}$ subject $[_{v'} v^0$ object]]: SVO	*				*

If $[_{vP}$ [object v^0] subject] is never optimal, this means that the system knows only one head-medial XP: X^0 between a *left* specifier and a *right* complement. The result is the claim that any 'object - verb - subject'-surface order is derived; there is no underlying form for it, such as there is for 'SVO', 'SOV' and 'VOS'.

Altogether, the highlights of the system's restrictiveness are summarized in (74):

(74)   The proposed system desirably excludes:

    i.   Uniform and non-uniform [[complement - head] spec]-directionality

                (Surface 'OVS' must be derived and cannot correspond to a [$_{vP}$ [object v^0] subject]-base.)

    ii.   Uniform [[head - complement] spec]-directionality

                (Surface 'VOS' can correspond to an underlying form, but can only be the basic order of a language with mixed directionality.)

    iii.   Grammars with *left*-peripheral *lexical* heads below *right*-peripheral *functional* heads (No 'anti-German'; and right-peripheral functional heads must be projected above right-peripheral lexical heads.)

    iv.   Grammars with *left*-peripheral *lexical* specs and *right*-peripheral *functional* specs (No 'reverse-Tzotzil'; a right-peripheral specifier must be a lexical one)

    v.   'Strict VSO' has no variant

                (No 'Mixtecan' without systematic [head - comp]-order and there is no mirror-type '[SO *t*] V]')

2.8   Comparing the current system with alternatives

Before we move on to chapter 3, it is crucial to recognize the key role of LEX HEAD EDGE in the explanation of the mixed word order cases at stake. So far, we have seen that LEX HEAD EDGE does the job. However, one might legitimately wonder how *necessary* its introduction is, and if some alternative couldn't have achieved the same outcome. For reasons of space, it is obviously not possible to discuss *all* the different options that are logically possible (not even all those that I have tried to consider before deciding on the current proposal...), but it is worthwhile to discuss a few well-chosen alternatives.

       First, if we want to account for the possibility of languages with left-peripheral functional heads but right-peripheral lexical heads (the 'German SOV-kind', type C), suppose we replaced LEX HEAD EDGE by a pair of constraints LEX HEAD RIGHT and LEX HEAD LEFT. We leave the residual set as proposed, and define LEX HEAD RIGHT/LEFT such that to obey them, a lexical head must right-/ left-align with LexP. We could then derive the directionality of type C in clauses by ranking LEX HEAD RIGHT >> HEAD LEFT >> HEAD RIGHT, LEX HEAD LEFT. HEAD LEFT >> HEAD RIGHT guarantees the preference for left-peripheral functional heads, and the ranking of LEX HEAD RIGHT ensures the right-orientation in the lexical base. The overall typology would

still include the types with uniform head directionality, now dependent on the ranking of the two pairs LEX HEAD LEFT/RIGHT, HEAD LEFT/RIGHT. We would still have a window in order to derive the mixed types A (Mayan VOS) and B (Mixtecan VSO), by bringing in BRANCHING RIGHT and GENERALIZED SUBJECT.

The problem with such an approach is the following. It easily predicts not only a type C language but also a type 'anti-C' language. Type 'anti-C' comes as the result of ranking LEX HEAD LEFT >> HEAD RIGHT >> HEAD LEFT, LEX HEAD RIGHT. We then get a preference of *right*-peripheral functional heads, by HEAD RIGHT >> HEAD LEFT. At the same time, lexical heads would be *left*-peripheral, due to LEX HEAD LEFT >> HEAD RIGHT.

Furthermore, type 'anti-C' would actually split into two subtypes depending on the ranking of GENERALIZED SUBJECT and BRANCHING RIGHT. This is true as long as LEX HEAD LEFT is violated in the presence of a left-peripheral lexical specifier, which we want in order to derive type A and type B. Basically, the overall typology would include two 'sisters' of type A and B, which only differ from their siblings by having *right*-peripheral functional heads instead of left ones. Type A's sister would combine a VOS -base order with right functional heads, and Type B's sister would be a strict VSO-language with functional heads likewise on the right side.[40]

In the above scenario, there would be two ways to eliminate type 'anti-C'. One possibility would be to stipulate that functional heads are universally (ergo, by GEN) on the left of their complements. This solution seems simple, but it has the immediate consequence that we no longer can analyze uniform SOV-languages as having right-peripheral functional heads. We must then introduce additional mechanisms in order to derive (for example) 'SOV - C^0'-surface.

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[40]Type A's sister results by ranking GEN SUBJECT, LEX HEAD LEFT >> HEAD RIGHT >> HEAD LEFT, LEX HEAD RIGHT, BRANCHING RIGHT; type B's sister by BRANCHING RIGHT, LEX HEAD LEFT >> HEAD RIGHT >> HEAD LEFT, LEX HEAD RIGHT, GEN SUBJECT.

A further note: If we defined LEX HEAD LEFT in a way that it is *not* violated by a left specifier (but only by a [complement - Lex^0]-order), we would lose the ability to derive type A and type B, without gaining much instead. The ranking LEX HEAD LEFT >> HEAD RIGHT >> HEAD LEFT, LEX HEAD RIGHT would still derive a type which combines left lexical with right functional heads. The only difference is that it would be a grammar with 'SVO' inside *v*P.

This could again problematically extend the typology: any movement operation that can shift an 'SOV'-constituent in front of a complementizer can potentially do so with an 'VSO'-, 'VOS'- or 'SVO'-constituent as well. (Recall that cf. Dryer 1992:102, there are no verb-initial languages with clause-final complementizers.). We have to back up those mechanisms with additional mechanisms to rule out the problematic cases.

The other possibility would be to suspend LEX HEAD LEFT, arguing that there is just a single LEX HEAD RIGHT constraint, in parallel to my claim of a single BRANCHING RIGHT constraint. Here we face the following problems. First, the ranking LEX HEAD RIGHT >> HEAD LEFT >> HEAD RIGHT correctly explains the directionality in the verbal extended projections of the Germanic SOV-languages. However, it wrongly predicts that, for example, nouns should follow all their arguments as well. We could accommodate this by making LEX HEAD RIGHT one degree more specific, for example, by replacing it with a PREDICATE HEAD RIGHT constraint. This is basically the route taken by Vikner 2001:145. His PREDICATE RIGHT doesn't go all the way down to referring to specific categories, but it comes close quantifying over heads that are 'predicates'. It is based on the assumption that the lexical pie can be split into two halves, the predicates, that is, verbs and adjectives, on the one side and the non-predicates, nouns and prepositions, on the other. Ranking PREDICATE RIGHT >> HEAD LEFT >> HEAD RIGHT forces underlying head-finality of both VP and AP; NP and PP have [head - complement]-order, since their directionality is determined by HEAD LEFT >> HEAD RIGHT only.

As an 'in depth'-analysis of Germanic SOV, an approach based on a PREDICATE RIGHT constraint definitely has some advantages;[41] as we have pointed out above (section 2.3.3), the current proposal requires a certain amount of abstractness in order to cover all the data without any exceptions. That is, we have to grant the assumption that every German VP/*v*P which contains a verb on the surface has a specifier. This specifier may be abstract at times (– especially in the case of impersonal passives). A PREDICATE RIGHT -approach has easier time on some of these language-internal details.

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[41]Even if, at least in German, AP is only *in part* systematically head-final on the surface. This differs from the situation in *v*P. See sections 5.1 – 5.2.

On the other hand, looking at the 'bigger picture', trading LEX HEAD EDGE for PREDICATE RIGHT, we would crucially lose the account of both VOS-languages and strict VSO-languages. Since PREDICATE RIGHT cannot be satisfied by aligning the lexical head on the left, neither a right-peripheral specifier nor leftward movement of a lexical head could possibly harmonize a structure. Consequently, both type A and type B either disappear from the typology, or they have to be the outcome of other conflicts between further, not independently motivated, constraints.

Now, one might argue that losing a unified cause for all three mixed word order cases at stake is primarily a conceptual flaw; it doesn't hurt in terms of 'typological promise', as long as we can come up with an alternative explanation for the occurrence of both 'VOS' and 'strict VSO'. In favor of LEX HEAD EDGE, this isn't all that easy. The main obstacle is an adequate derivation of what it means to be 'basic VOS': the Mayan languages and Malagasy not only have a basic VOS-surface order, but they also have a *mixed* word order. That is, functional specifiers, and adjuncts, are on the left. The current proposal makes the mixed directionality an essential part of the analysis and an essential part of type A.

Consider next the alignment system proposed by Grimshaw 2001a, which assumes a triple of {SPECIFIER LEFT, HEAD LEFT, COMPLEMENT LEFT}, each one lacking a polar opposite constraint. HEAD LEFT, in opposition to the definition chosen by the current proposal, is violated by the presence of a specifier, and all three constraints are gradient (cf. Grimshaw 2001a:5)[42]. This system not only derives uniform SVO- and uniform SOV-languages, it furthermore derives VOS, by ranking HEAD LEFT >> COMPLEMENT LEFT >> SPECIFIER LEFT. However, just as SVO and SOV are expected to have uniform directionality, so is VOS. What we get here is a grammar that not only has right-peripheral lexical specifiers but *consistently* has right-peripheral specifiers. This is not the VOS-pattern encountered in the empirical typology: *wh*-phrases, focus- and topic-phrases do not follow their complement, but rather precede it. Consequently, we need some additional factor(s) in order to make a difference between uniform and mixed

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[42]In footnote 2, Grimshaw 2001a:5 notes that the gradient interpretation is not required if head alignment is relative to X-bar rather than to XP. However, only if the constraints are gradient is a [[X^0 complement] spec]-grammar included in the factorial typology.

directionality, in order to capture which kind of 'mixed' structures are possible and which are not.

One side remark: The prediction of a uniform VOS-type is still maintained if we merely added LEX HEAD EDGE to Grimshaw's triple {SPECIFIER LEFT, HEAD LEFT, COMPLEMENT LEFT}, or, alternatively, if we tried to combine LEX HEAD EDGE with HEAD LEFT, HEAD RIGHT as they were originally defined in Grimshaw 1997:374. As long as HEAD LEFT is violated by the presence of a specifier, ranking HEAD LEFT higher than the other constraints (more generally, ranking it higher than *whichever* constraint forces left-peripheral specifiers) will have the outcome of a uniform VOS-language. (The same holds for the prediction of a uniform OVS-type; see below.) It is mainly for that reason that the current proposal has adapted an alternative definition of HEAD LEFT and HEAD RIGHT.

The above prediction of allowing 'uniform VOS' is also shared by the Optimality theoretic system proposed by Morimoto 2002, who adopts Broadwell 2001, 2002, in a development of Sells 2001. Here, we find the slimmed down set of three alignment constraints HEAD LEFT ("every projecting X^0 is left of its immediate constituent"), SPEC LEFT ("specifier of XP is leftmost in XP"), and BRANCHING UNIFORMITY ("directionality of X and all of its extended heads and their projections must be uniform") (cf. Morimoto 2002:24). BRANCHING UNIFORMITY is unviolated in either a head-final grammar which is fully right-branching (meaning that it has only left-peripheral specifiers and adjuncts), or in a head-initial grammar which is fully left-branching (meaning that is has only right-peripheral specifiers and adjuncts). Now, Morimoto's factorial typology includes a VOS structure, by HEAD LEFT >> BRANCHING UNIFORMITY >> SPEC LEFT (cf. Morimoto 2002:27), but significantly, it is once more a grammar which aligns specifier and adjuncts right-peripherally across the board. Morimoto acknowledges this problem in footnote 26, referring to discourse constraints such as TOPIC-LEFT, FOCUS-LEFT etc. to overcome the shortcoming. But the more fundamental problem is the one that concerns factorial typology. Ranking the discourse constraints on top of the VOS-ranking, we might be able to derive Tzotzil or Malagasy, but we still predict the *possibility* of 'uniform VOS'-languages, as a result of ranking the discourse constraints below BRANCHING UNIFORMITY.[43]

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[43]Morimoto's system furthermore does not allow any head-final grammar to project functional heads in the

But the problem is how could we push only the lexical specifier to the right without using LEX HEAD EDGE? Recall that the assumption of a LEX HEAD LEFT constraint is problematic, due to its questionable typological impact. We have discussed this just above. So, what about the possibility of a LEX SPEC RIGHT constraint?

We could combine a constraint that specifically asks for a right-peripheral lexical specifier with the set {HEAD LEFT, HEAD RIGHT, BRANCHING RIGHT, PREDICATE RIGHT} (definitions of HEAD RIGHT/LEFT as in the current proposal). The ranking **LEX SPEC RIGHT >> BRANCHING RIGHT; HEAD LEFT >> HEAD RIGHT, PREDICATE RIGHT** manages to derive the mixed directionality of type A. Type C could be captured by ranking **LEX HEAD RIGHT >> HEAD LEFT >> HEAD RIGHT; BRANCHING RIGHT >> LEX SPEC RIGHT**. Only type B would be left uncovered, but, importantly, no re-ranking would yield a type 'anti-C' with left-peripheral lexical but right-peripheral functional heads. Unfortunately, we still do not achieve the same restrictedness as we do with LEX HEAD EDGE. LEX SPEC RIGHT perturbs the overall typology in yet another way.

Recall that LEX HEAD EDGE not only predicts type A, and thus allows [[head - complement] spec] in LexP, it also *excludes* [[complement - head] spec] as an underlying basic form, be it inside or outside the lexical domain. This corresponds to the empirical contrast between a moderate frequency of VOS-languages and the extreme rareness of OVS. Now, replacing LEX HEAD EDGE by LEX SPEC RIGHT (plus PREDICATE RIGHT), we are unable to predict this contrast. On the contrary, the overall typology would include *three* types. On the one hand, it would include type A, as desired. But on the other hand, it would also

syntax, neither right-peripheral *nor* left-peripheral ones (cf. Morimoto 2002:27). That is, any SOV-pattern must correspond to a syntactic structure with just one "single right-headed V^0 at the bottom". Here is why this is eventually a shortcoming as well: First, as in fact featured by Morimoto, tense, aspect and complementizers must be affixal in any uniform SOV-language, inserted under the V^0-node together with the verb. See chapter 3 for reasons against such approach (see also chapter 6 for examples of *non*-affixal complementizers in SOV-languages).

Second, in order to derive a grammar like German (which is classified by Morimoto 2002:27 as a head-final grammar as well), left-peripheral functional heads must be forced by additional constraints. Morimoto 2002:29, for example, proposes a Verb Second constraint "the inflected verb must be in second position in main clauses, and it occupies a functional head position". Even with this addition, we still need at least a constraint to derive the directionality of the complementizer and of prepositions. Beyond that, there is the fact that German noun phrases are not head-final, a fact which is impossible to derive with Morimoto's system.

contain *two* variants of what we could call a 'basic OVS'-language. First, the ranking Lᴇx Sᴘᴇᴄ Rɪɢʜᴛ, Pʀᴇᴅɪᴄᴀᴛᴇ Rɪɢʜᴛ >> Hᴇᴀᴅ Lᴇꜰᴛ, Bʀᴀɴᴄʜɪɴɢ Rɪɢʜᴛ >> Hᴇᴀᴅ Rɪɢʜᴛ would give us a type which prefers [spec [head - comp]] inside functional projections, but [[comp - head] spec] inside the lexical, verbal domain. This is basically a parallel to the Mayan-VOS-directionality, but with 'OVS' inside *v*P. Second, the ranking Lᴇx Sᴘᴇᴄ Rɪɢʜᴛ, Hᴇᴀᴅ Rɪɢʜᴛ >> Hᴇᴀᴅ Lᴇꜰᴛ, Pʀᴇᴅɪᴄᴀᴛᴇ Rɪɢʜᴛ, Bʀᴀɴᴄʜɪɴɢ Rɪɢʜᴛ leads us to expect that a language could also generally favor right-peripheral heads (lexical and functional) *and* combine this with a preference for [[comp - head] spec] inside LexP. This is a uniformly head-final language, but with 'OVS' inside *v*P. In total, the typology would include more OVS-types than VOS-types, contrary to the empirical facts.[44]

Finally, notice that we have avoided any appeal to alignment constraints that are truly category-specific. One should be aware that any account based on a set of category-specific constraints would result in a possible explosion of different mixed word order types. Considering only the set of four categories {N, V, A, P}, and assuming a pair of X-Hᴇᴀᴅ Lᴇꜰᴛ, X-Hᴇᴀᴅ Rɪɢʜᴛ for each of them, already gives us a typology of 14 different types with mixed head directionality, plus only two in which all categories agree with respect to either [head - comp] or [comp - head]-order. Thus, on this view, un-supplemented by extrinsic constraints (cf. Hawkins 1988), mixed word order languages should be statistically common, and uniform languages rare. But the opposite is closer to the truth. Moreover, due to the much higher number of mixed cases, it degrades the occurrence of a language with uniform word order to a mere 'accident'. What is even worse is the fact that any such approach entirely misses the recognition of any systematic aspect in the phenomenon of mixed directionality.

In summary, this discussion has hopefully shown that it is far from easy to find a simple replacement for Lᴇx Hᴇᴀᴅ Eᴅɢᴇ, and to still maintain the same typological results.

Therefore, the essential outcome of this section is the following. The recognition of Lᴇx Hᴇᴀᴅ Eᴅɢᴇ is important because it notices an additional demand on directionality in the *lexical*

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[44]To further elaborate upon the side remark on Grimshaw 2001a made above: Just as a system that combines Lᴇx Hᴇᴀᴅ Eᴅɢᴇ with Grimshaw's triple {Sᴘᴇᴄ Lᴇꜰᴛ, Hᴇᴀᴅ Lᴇꜰᴛ, Cᴏᴍᴘʟ Lᴇꜰᴛ} cannot exclude a *uniform* VOS-type, so it can also not exclude the derivation of a *uniform* OVS-language which might be even more controversial. Ranking Cᴏᴍᴘʟᴇᴍᴇɴᴛ Lᴇꜰᴛ >> Hᴇᴀᴅ Lᴇꜰᴛ above the other constraints, we get a type that prefers [[complement - head] spec] across all categories, including the functional domain.

domain. This brings in a certain amount of specificity, just enough to open up for an approach to mixed word order, which is still general enough to recognize how systematic the phenomenon is.

The current system draws a clear cut between the functional and the lexical domain. If a grammar has mixed directionality, then it is necessarily the lexical layer in which a marked pattern emerges. The functional layer tends to be the domain of unmarked directionality. On the other hand, not just any kind of logically possible marked pattern is an option. While there are in principle two unmarked orderings, 'spec - head - complement' and 'spec - complement - head', still, there are systematic limitations regarding which kind of marked pattern each unmarked one can be combined with.

Another important aspect of the LEX HEAD EDGE proposal is the fact that it targets *edges*. We have seen that, as soon as one operates with lexical alignment, if one considers constraints which target a specific side of the phrase, *left* or *right*, the predicted typology substantially changes, and not for the better.

Thus, we can conclude: If we recognize the concept of *edges* as relevant in the *lexical* domain of syntax, we benefit. Only then are we able to produce the typology we have introduced in this chapter, a typology of basic phrase directionality which is promising with respect to both its scope and its restrictedness.

This chapter has introduced a system of phrase structure directionality which allows, besides uniform basic word order types, the occurrence of a few non-uniform cases. All of them are systematic in their non-uniformity. Focusing on variation in directionality of the underlying form, the main theme was the proposed main cause of this variation, the constraint LEX HEAD EDGE.

The focus of the chapters 3 and 4 will be the variation of systematic movement out of the lexical layer. Beyond extending the established constraint set {HEAD LEFT, HEAD RIGHT, LEX HEAD EDGE, BRANCHING RIGHT, GENERALIZED SUBJECT} by adding one new constraint, both chapters will demonstrate that none of the constraints stops the influence on directionality. Rather each constraint furthermore co-determines the distribution of systematic movement of 'lexical base'-material. As such, we see how grammatical principles that come in the shape of general, conflicting and violable constraints are usually 'multi-functional', since they can have an impact on a grammar in more than one way.