

A microparametric approach to the head-initial/head-final parameter

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Abstract: The fact that even the most rigid head-final and head-initial languages show inconsistencies and, more crucially, that the very languages which come closest to the ideal types (the “rigid” SOV and the VOS languages) are apparently a minority among the languages of the world, makes it plausible to explore the possibility of a microparametric approach for what is often taken to be one of the prototypical examples of macroparameter, the ‘head-initial/head-final parameter’. From this perspective, the features responsible for the different types of movement of the constituents of the unique structure of Merge from which all canonical orders derive are determined by lexical specifications of different generality: from those present on a single lexical item, to those present on lexical items belonging to a specific subclass of a certain category, or to every subclass of a certain category, or to every subclass of two or more, or all, categories, (always) with certain exceptions.¹

Keywords: word order, parameters, micro-parameters, head-initial, head-final

1. Introduction. An influential conjecture concerning parameters, subsequent to the microparametric approach of Government and Binding theory (Chomsky 1981, 6ff and passim), is that they can possibly be “restricted to formal features [of functional categories] with no interpretation at the interface” (Chomsky 1995, 6) (also see Borer 1984 and Fukui 1986). This conjecture has opened the way to a microparametric approach to differences among languages, as well as to differences between related words within one and the same language (Kayne 2005, §1.2). It also prompted the idea that macroparameters may possibly be reinterpreted as the concerted action of some number of microparameters (Legate 2002, Kayne 2005, Adger, Harbour and Watkins 2009, Rizzi 2009, among others), even though the question remains open to some extent (see Baker 2008; and Roberts 2012 for an attempt at reconciling the two approaches).

Here I want to explore the possibility of analyzing what is often considered a prototypical macroparameter (the head-initial/head-final parameter) in microparametric terms, “generalizing to the worst case” (to use Richard Montague’s strategy) of lexically encoded instructions.² This is

¹ I wish to thank Klaus Abels, Daniel Büring, Richard Kayne, Ad Neeleman, Massimo Piattelli Palmarini, Ian Roberts, Luigi Rizzi and Jan-Wouter Zwart for discussions on aspects of this analysis, as well as the audiences of the CamCos5 Conference in Cambridge (5-7 May 2016), and of my classes at Tel Aviv University (May-June 2016), especially Alex Grosu, Julia Horvath, Roni Katzir and Tal Siloni. I also wish to thank Mark Baker and an anonymous reviewer for their detailed comments on a previous draft of the paper.

² An important precedent of the microparametric approach to word order typology explored here is Webelhuth’s (1992) restrictive notion of possible parameter of natural language, modulo internal Merge in place of specification of direction: “if no lexical entry can refer to feature F, then no parameter can refer to F” (Webelhuth 1992, 31), which amounts to saying that the “parameters of natural language are nothing but generalized versions of lexical statements”

rendered plausible by at least two considerations: 1) the fact that no language is totally consistent (Smith 1981,39) and that even the most rigid head-final and head-initial languages display a number of inconsistencies, and, more importantly, 2) the fact (actually, a paradox) that the languages which come closest to the ideal types (the “rigid” SOV and the VOS languages) are apparently a minority among the languages of the world (cf. Dryer 1992,fn.17 and section 4 below).

Before addressing the question of how to express the word order parameter(s) in microparametric terms (section 4), I will consider some general issues of the head-final and head-initial orders.

In Cinque (2009b, 2013a) I had suggested that we should try to reconstruct the two *ideal* head-final and head-initial orders that transpire from the most rigid SOV and VOS languages, even if each of these may depart from such ideal orders in one or more ways (see section 4.1 below for relevant evidence and references). The reason for taking this position is threefold: first, because fairly clear patterns, or at least clear tendencies pointing to such patterns, are recognizable, as already observed in the works of Greenberg (1963), Vennemann (1973), Lehmann (1978), Hawkins (1983) and Dryer (1992); second, because the reconstruction of such ideal orders and, in particular, the way in which they are derived may constitute a ‘metric’ on the basis of which one can measure the distance of each language from a ‘standard’, and in principle determine the place that each language occupies in the space of admitted variation (the fact that the ‘standard’ may be perfectly instantiated by no single language should not matter)³; third, because the Merge structure and derivational options admitted by UG may provide a plausible account of acquisition in that they allow the child to reconstruct on the basis of the primary linguistic data the language particular options that derive his/her language (see section 4.4 below).

Of course, a full reconstruction of the ideal head-final and head-initial orders is out of the question here, as was in Cinque (2013a) (see the Appendix there, as well as Lehmann 1978, Dryer 1992, and Primus 2001,856 for partial lists of the correlation pairs of each ideal order, still a long way from representing the *total* orders of the clause and its major phrases in the two ideal language types). In

(Webelhuth 1992,30), only differing in the number of categories to which they apply (in English, for example, to a single adjectival degree modifier, *enough* (*long enough* vs. *very/too/quite/etc. long*), or to all adjectival measure modifiers (*two feet (too) long/high/etc.*)). On the lexical locus of parameters as instructions for syntactic actions see the discussion in Rizzi (2014,2016, and this volume).

³ Deviations from the uniform application of the derivational mechanism that yields the ideal head-initial and head-final orders not only characterize, say, “how head-final language X is”, but, more crucially, set specific restrictions on what variations are admitted and what variations are excluded (say the order Numeral Adjective Demonstrative Noun in the DP of a head-final language or the order C ASP_{progressive} T_{past} V in the clause of a head-initial language).

any event the basic generalizations are discernible and they raise the question of how they should be derived.⁴

2. The two ideal types.

2.1 The “head-initial” type.

The generalization concerning the ideal head-initial word order type appears to be that **all higher (functional) heads precede V/N/etc. in their (hierarchical) order of Merge, and phrasal specifiers (arguments, circumstantials, and modifiers) follow V/N/etc., in an order which is the reverse of their (hierarchical) order of Merge.**⁵ See (1)a and (2)a, with some representative examples:

(1)a. C° T° Asp° V PP/AdvP DP AdvP⁶

b. **Malagasy** (Malayo-Polynesian, VOS - Rackowski and Travis 2000,125)

Tsy manasa intsony mihitsy ny lamba Rakoto
Neg Pres.AT.wash no longer at all det clothes Rakoto
‘Rakoto does not wash at all any longer the clothes’

c. **Chol** (Mayan, VOS - Coon 2010,241, from Vázquez Alvarez 2009,19)

Tyi k-sub-u [che` mi i-bajb-eñ ts`i` aj-Wǎn].
PRFV A1-say-TV COMP IMPF A3-hit-D.NML dog CL-Juan
‘I said that Juan hits the dog.’

d. **Sakun (Sukur)** (Chadic, VOS – Thomas 2014,88)

a dǎ-r kərá=j nə dʒíf Lawu
PFV hit-EXT dog=REL with stick Lawu
‘Lawu hit the dog with the stick.’

⁴ Section 2. draws from Cinque (2013a). Section 3. refines the derivational account proposed there.

⁵ But see fn.8 below on the possibility that overt ‘heads’ be actually specifiers of silent heads (Kayne 2016).

⁶ On the general order in (1)a, see sections 1 and 2 of Rackowski and Travis (2000) on Malagasy (VOS) and Niuean (VSO), respectively: “there [...] seems to be a correlation between preverbal elements which appear in their hierarchical order and postverbal elements which are in the reverse order” (p.127). On what appears preverbally in “verb initial languages” see the first part of Greenberg’s (1963) Universal 16: “In languages with dominant order VSO, an inflected auxiliary always precedes the main verb.”. Carnie and Guilfoyle’s (2000b,10) also state that a trait of VSO languages is represented by “preverbal tense, mood/aspect, question, and negation particles”. Also see the Konstanz Universals Archive, no. 501 and 1553, Dryer (1992a, §4.3 and §4.5) and Hendrick (2000). On the phrasal, rather than head, status of the verbal, adjectival, nominal, prepositional predicate following the preverbal particles in a number of V-initial languages, see Massam (2000, §2), Lee (2000), and Cole and Hermon (2008).

(2)a. Case° D° PL° N AP* NumP RC DemP⁷

b. **Tukang Besi** (Malayo-Polynesian, VOS - Donohue 1999,307, adapted from ex. (20))

[na wowine mandawulu dua-mia [umala te pandola]_{RC} [meatu'e ai]_{Dem}]_{KP}

NOM woman beautiful two-CLF [fetch.SI art eggplant] REF-that ANA

‘those two beautiful women who were bringing eggplants’

c. **Sakun (Sukur)** (Chadic, VOS – Thomas 2014,84)

jím mǝ-dʒamak-ón xá=j pǝka kí tʃitʃiji ná

stone HAB-big.PL-NOM PL=REL collect 2PL DEM TOP

‘These big stones that you collect..’

d. **Tongan** (Oceanic, VSO/VOS - Ball 2009,116; also see Macdonald 2014,§1.1)

Na'e kamata [langa 'e Sione 'a e ngaahi fale].

Pst begin build erg (name) Case_{abs} D PL house

‘Sione began building the houses.’

2.2 The head-final type.

The generalization concerning the ideal head-final word order type appears to be that **all higher (functional) heads follow the lexical V/N/etc. in an order which is the reverse of the (hierarchical) order of Merge, and phrasal specifiers (arguments, circumstantials, and modifiers) precede V/N/etc. in their (hierarchical) order of Merge.** See (3)a, and (4)a, followed by some illustrative examples:⁸

⁷ On the order **article (D°) > N** in all VOS languages (except Toba Batak), in his sample, see Keenan (1978,G15,p.298), and more generally in head-initial languages Dryer (1989b,1992,§4.6). On the order **PL > N** in VO languages, see Dryer (1989a, 1992,§4.7).

⁸ A particularly striking case is provided by Kiowa, which shows a mirroring effect around the axis of the verb, with preverbal evidential, epistemic, negation and aspectual (phrasal) particles co-occurring with (head) suffixes of the corresponding type in the reverse order after the verb (see Adger, Harbour and Watkins 2009, Chapter 3). For the time being I will keep to the tradition that takes complementizers, tense and aspect morphemes, determiners, Case markers, etc. (whether free or bound), to be heads, and arguments, circumstantials, adverbial and adjectival modifiers, etc. to be phrases. If Kayne (2016) is right in arguing that all heads are silent and that all overt elements are phrases, some other way will have to be found to draw the distinctions reported in 2.1 and 2.2. One possibility that I explore later is to think that what are traditionally assumed to be heads are XPs which, differently from argumental, circumstantial and adverbial phrases, share with lexical V(P)s, N(P)s, etc. the property of selecting for a specific complement category and of labeling structures resulting from Merge (see below). In fact, we shall see that the derivation of the two ideal orders are possibly best formulated in term of a generalized movement of phrases.

(3)a. AdvP DP AdvP/PP V Asp° T° C°

b. **Japanese** (SOV – Endo Yoshio, p.c.)

Watasi-wa [kare-ga osoraku sore-o zyoozuni okona-e-ru to] it-ta.
I-Top [he-Nom probably it-Acc well do-Mod-Present COMP] say-Past
‘I said that probably he can do it well’

c. **Evenki** (Tungusic, SOV – Nedyalkov 1997,256)

Nunqan ulle-ve tulile lo:van-d’e-ngne-re-n
She meat-ACC outdoors hang-IMPRF-HAB-PAST-AGR
‘She usually hangs meat outdoors for some time (for drying)’

d. **Maranungku** (Australian, Daly, SOV – Tryon 1970,46)

yer ngeti tyapat me tu
tomorrow I sit.swim PROG FUT
‘Tomorrow I shall be swimming’

(4)a. DemP RC NumP AP* N PL° D° Case⁹

b. **Wolaytta** (West Cushitic, SOV – Lamberti and Sottile 1997,215)

he [taa- w kuttuw^a ehida] iccash^u adussa laagge-t-I
those me-dat chicken having-brought five tall friend-PL-NOM
‘those five tall friends who brought me a chicken’

c. **Mangghuer** (Mongolic, SOV - Slater 2003,99)

bi [tuerghang kong ge =ni] ala ge-ba
Isg. [fat person det.indef ACC] kill do-subj:perf
‘I have killed a fat person’

d. **Tsez** (Northeast Caucasian, SOV – Polinsky 2015,41)

yisi Tolstoy-ä cäx-ru(-ni) læna y-exora t’ek
DEM Tolstoy-ERG write-PST.PTCP-DEF five II-long book.ABS.II
‘these five long books written by Tolstoy’

2.3 The over-arching generalization. The property which both the ideal head-initial and head-final word orders have in common is that whatever precedes the V/N/etc. reflects the (hierarchical) order of Merge, and whatever follows is in the mirror image of the (hierarchical) order of Merge (cf. Baker 1985). This, again, is an idealization based on the most rigid head-initial and head-final

⁹ AP* stands for one or more APs. Mallinson and Blake (1981,377) and Dryer (1988) point out that the often-claimed correlation between SOV order and adjective-N order is spurious, but see Cinque (2013a,fn.5) for discussion.

languages. The mirror-image order found postverbally and postnominally is however only the prevalent order, other, non-mirror-image, orders being possible (see Cinque 2005b, 2013a, Koopman 2015b, and references cited there).

3. Deriving the two ideal word order types.

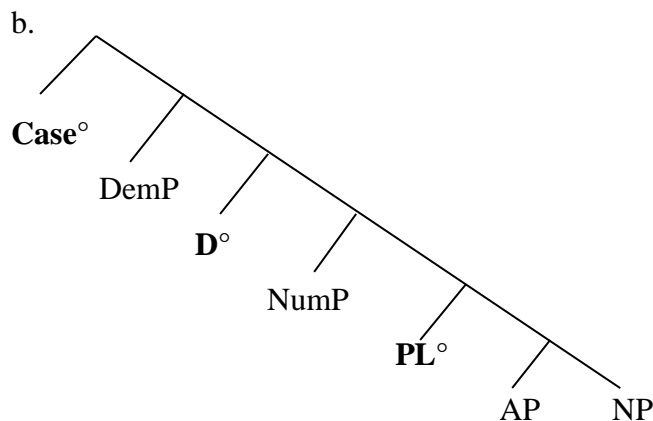
As in Cinque (2013a), I take the two ideal (mirror-image) word order types to be epiphenomenal. They are the product of the consistent application of two different movement options to one and the same structure of Merge, common to all languages. This common structure presumably reflects the relative semantic scope of the elements involved, though it remains to be seen whether the statement of their hierarchy in the extended projections of V, N, etc. can be expunged from narrow syntax and blamed in toto on the conceptual-intentional interface. Even if their hierarchy plausibly complies with the semantic scope of the elements involved¹⁰, two caveats must be taken into account before concluding that it is of no syntactic concern. First, within a single clause the hierarchy of functional projections appears to be generally strict, even though in the semantics nothing precludes reversing their scope as we see whenever two clauses are involved (Cinque 1999, §6.3). A second possible reason why the encoding of such functional elements should not be eliminated from narrow syntax is the fact that our conceptual-intentional module contains many more concepts than those that receive a grammatical expression in the languages of the world (cf. Cinque 2006, 6, and especially 2013b). This means that the inventory of functional/grammatical concepts must presumably be encoded somewhere in UG, possibly in its (functional) lexicon. The striking fact concerning the ideal head-final and head-initial orders reconstructible from the most polarized SOV and VOS languages is the segregation of the heads, which appear on one side of V, N, etc., and of the phrases, which appear on the opposite side (but see fn.8, and below, for a possible phrasal interpretation of traditional heads). Given that a symmetrical merger of heads and phrases, to the left and to the right of V, N, etc., would still need to be supplemented by movement for some of the attested orders (e.g., V Tense Aspect or N Dem Num A), as even the proponents of symmetrical Merge concede (cf. Abels and Neeleman 2012), and given the redundancy that this implies in so far as under symmetrical Merge some of the orders would be derivable by both Merge

¹⁰ In certain cases, such as the arguable hierarchical structure of Augmentative > Pejorative > Diminutive > Endearing ‘heads’ (Cinque 2015b), this still has to be independently determined.

and Move, I will assume here that only movement is involved in deriving the different orders (including those that are not consistently head-final nor consistently head-initial).¹¹

Concerning the two prevalent orders of the demonstrative, the (cardinal) numeral, the adjective(s) and the noun, i.e. the mirror-image orders N A Num Dem and Dem Num A N, in Cinque (2005b) I had assumed that only the former involves movement (raising of the NP plus *whose-picture* or ‘progressive’ pied-piping). In the case of the Dem Num A N order I had instead assumed that no movement was involved in their derivation, given that this order directly reflects the underlying order of Merge of these elements in all languages; but this was wrong, as the N in many languages with such an order is followed by bound or free morphemes expressing gender, number, (diminution,) definiteness and/or Case (cf. (5)a - Svenonius 2008, Myler 2013, Cinque 2013a), which arguably originate as head morphemes interspersed in the base structure with the phrasal modifiers in the extended projection of the noun (as shown in (5)b):¹²

(5)a. DemP NumP AP N PL[°] D[°] Case[°]



See, for example, the cases of the Tupí-Guaraní languages Kokama ((6)a.) and Nheengatú ((6)b.), which are all SOV, Dem Num (A) N PL languages¹³, or those of the South Caucasian language Laz

¹¹ Abels and Neeleman (2012) take the fact that the possible symmetric merger of phrases to the left or to the right of a head are more numerous than those that have to be derived by movement to suggest that learners disprefer movement and posit it only when they have to. Here I stick to a uniform movement derivation for all orders under antisymmetry.

¹² Also see Koopman and Szabolcsi's (2000,24f) arguments that the ‘direct’ order of verbal complexes in Hungarian, not just the ‘inverse’ one, must be derived by movement. As implicit in (5)b I take demonstratives, (cardinal) numerals and adjectives to constitute phrases (for demonstratives see Giusti 1994 and Leu 2015,Chapter 2; for cardinals Kayne 2003b,fn.11, 2006, and for adjectives Cinque 2010a), and, as I said, for the time being I take Case morphemes, Determiners and Number morphemes (whether free or bound) to be heads (but see fn.8 and below).

¹³ This order is the exact mirror image of the head-initial PL N A Num Dem order of Yoruba (Niger-Congo - SVO - Dryer 1989,§2.4 and Oládíípò Ajibóyè, p.c.), and Mwoṭlap (Oceanic - SVO - Crowley 2002,§2.6), which will also necessitate a refinement of the movement account of the N A Num Dem order of Cinque (2005b) (see below). For the

((7)a.), of the Mongolic language Mangghuer ((7)b.), and of the language isolate Burushaski ((7)c.), which are all SOV and Dem Num A N (PL) D Case languages:

(6)a. ca+ yawara kira +nu (Kokama - Cabral 1995,336)

1(FS)+ dog DIM PL
'my little dogs'

b. mukũi tayera ita (Nheengatú - da Cruz 2011,147)

two daughter PL
'two daughters'

(7)a. ham oxorza-lepe-și (Laz - Kutscher 2001,36)

Dem woman-PL-GEN
'of these women'

b. bi [tuerghang kong ge =ni] ala ge-ba (Mangghuer - Slater 2003,99)

Isg. [fat person det.indef ACC] kill do-subj:perf

'I have killed a fat person'

c. hín mapéer-an-e (Burushaski - Yoshioka 2012,141)

one aged-indefDet-ERG
'one old man'

I take this to mean that the NP must move up even in this type of languages to the left of these 'heads' (if they are free morphemes or agglutinative morphemes that can be "suspended"), or move up to the corresponding projections to check the relevant features (if they are inflectional morphemes). In Cinque (2013a) I suggested that this can be achieved if the NP raises via *picture-of-whom* or 'regressive' pied-piping.

relative order of determiner, number and diminutive free morphemes when they co-occur, see example (i) in head-initial Teop (Oceanic - SVO - Mosel (with Thiesen) 2007,§7.6) (and their partial mirror image in head-final Kokama – (6)a.):

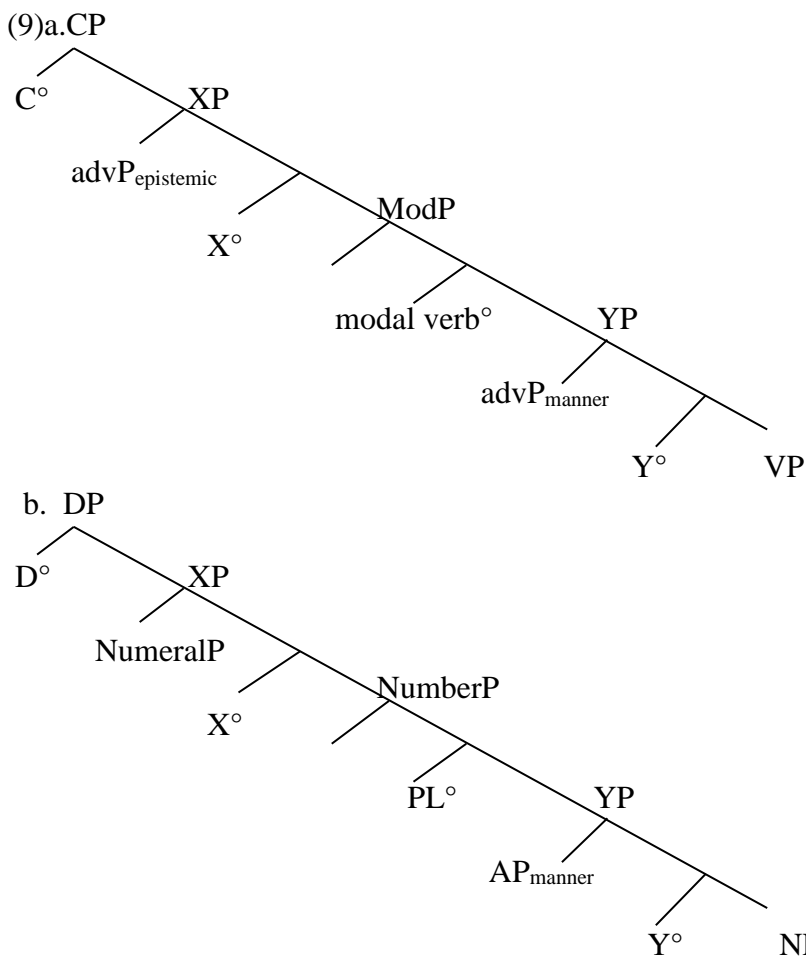
(i) a maa si mono iana
D PL DIM parcel fish
'little fish parcels'

If Case is also present, as in Tongan (ex. (2)d. above and Macdonald 2014,§1.1), it appears to precede article and number (in head-initial languages): CASE D PL N. The head-final mirror-image order N PL D CASE is rarely found as in head-final languages D and Case are often in complementary distribution (for reasons that remain to be fully understood). But see the case of Mangghuer in (7)b, Eastern Burushaski in (7)c., and the examples of N D CASE in the Tibeto-Burman languages Japhug rGyalrong (Jacques 2010,144) and Nar (Noonan 2003,346).

I will now sketch what I take the derivations for the ideal, consistent head-initial and consistent head-final orders to be. Since the more rigid VOS and SOV languages appear to be essentially harmonic across the different extended projections, I will exemplify with the extended projection of the VP (the clause) and the extended projection of the NP, coming back later to the general question of cross-category harmony, and the possible parameters of variation.

The reason to consider the two orders as derived from a common hierarchy is that irrespective of the different orders of the same elements in the two types of languages (see (8)a-a' and (8)b-b') we would like to express the fact that the relative position and scope of these elements is the same, as represented in (9)a. and b.

- | | | |
|-----|---|--|
| (8) | head-initial | head-final |
| | a. C° Mod° V AdvP _{manner} AdvP _{epistemic} | a'. AdvP _{epistemic} AdvP _{manner} V Mod° C° |
| | b. D° PL° N AP _{manner} NumP | b'. NumP AP _{manner} N PL° D° |

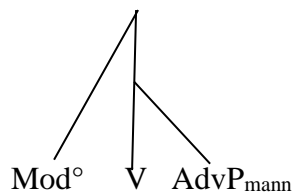


I thus take neither of the two orders in (8)a-a' and (8)b-b' to be more primitive than the other, but to derive from a common structure by blindly applying movement, in the way illustrated below, of the

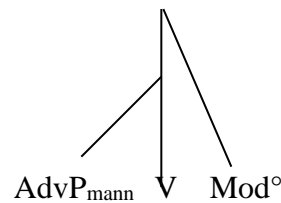
verbal and nominal projections in either of two ways: progressive pied piping for head-initial languages and regressive pied piping for head-final ones.

While a symmetrical generation of the elements could easily capture the identical scope relations of (8)a-a' and (8)b-b' (cf. the simplified structures in (10)), a symmetrical generation could not capture the scope relations of certain other orders without violating the “No-Tangling” principle - see the case of (11).

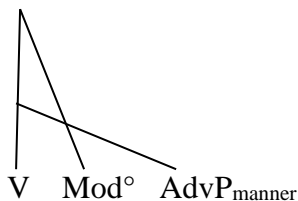
(10)a. head-initial



b. head-final



(11)a.



- b. khun doong phoo **phaasa** thai **dai nit-nooi** (Thai – Simpson 1998, cited in Duffield 1999,118)
 you must suffice **speak** Thai **can a little**
 ‘You must be able to speak a little Thai.’

For (11), movement of VP, in (9)a., above Mod° and AdvP_{manner} in one fell swoop seems to be the only option (but then movement may also derive what could be merged symmetrically, thus avoiding the redundancy of deriving some orders by either movement or base generation).¹⁴

I take (9)a-b above to be antisymmetric Spec > head > complement structures (Kayne 1994) terminating in (or rather originating from) a non branching VP/NP, with complements of V and N merged in specifier positions above VP/NP, to the effect that nothing is merged directly with V or N (to their right), for reasons discussed in Cinque (2009a).¹⁵

¹⁴ I assume that local reordering of morphemes (as in Distributed Morphology) should ideally be avoided. Also see Koopman (2015a,b) for arguments that the same ‘computational engine’ (phrasal movement within an antisymmetric Merge structure) underlies both narrow syntax and word formation.

¹⁵ Namely, to capture the pervasive left-right asymmetry of natural languages. This will also require a different way to distinguish ‘(subcategorized) complements’ from ‘non-complements’. For some discussion see Cinque (2004,note 19, and relative text).

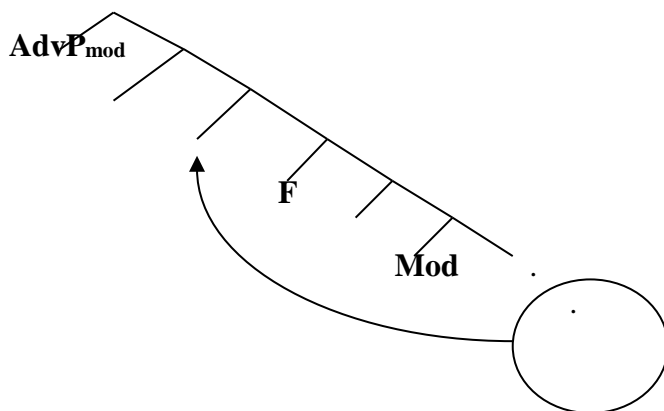
In Cinque (1999), I took AdvPs corresponding to a modal or other functional head to be sitting in the Spec of that head, but this has proven problematic for head-final languages (or constructions), where the AdvP and its head can be separated by material which raises in between them, as in (12):

(12) Er wird *notwendigerweise* [ein Buch schreiben] *müssen* (um die Position zu erhalten)

He will necessarily a book to.write have to (to get the job)
 ‘He will necessarily have to write a book (to get the job).’

This suggests that the correspondence between a head and the matching advP must rather be stated in terms of a “space” made out of more than one projection. One way to retain the basic insight is to assume paired functional projections separated by empty (silent) projections hosting moved constituents, arguably needed, as I discuss later, to derive the canonical word order of languages:¹⁶

(13)



The present proposal shares with Haider (1992,2013,Chapter 3) and Barbiers (2000) the idea that the Merge structure of clauses originates from V and is strictly right branching, though it differs from them in assuming that movement is involved in deriving both head-initial and head-final languages, in the ways sketched below.

¹⁶ This resembles Nash and Rouveret’s (1997) notion of proxy category and Biberauer, Holmberg and Roberts’s (2014,§4.3.1) caret feature (which they postulate just for the derivation of head-final languages) with “no semantic content, and no connection to phonological or morphological properties beyond simply causing movement” (p.209). Quite clearly, the canonical word order(s) of a language must be distinguished from information related (A- and A’-) movements, which have an effect on interpretation (Cf. Chomsky’s 2008,7 idea that linearization “plays no role in core syntax and semantics.”). Possibly relevant is the fact that the two pied piping movement options (*whose-pictures*, or progressive, pied piping and *pictures-of-whom*, or regressive, pied-piping), which are arguably involved in the derivation of head-initial and head-final orders, are known not to affect interpretation (cf. *Who did he see pictures of?* and *Pictures of whom did he see?*). The functional sequence may also have to be modified to make room for Williams’ (2003,174) “subcycles” in specifier position for recursion of adjuncts, as well as for ‘side’ functional sequences within the main one (see Cinque 2015a), though I cannot dwell on these questions here.

One of the paired projections represents the core functional notion and the other a non core, adverbial, modification of the same functional notion. Languages may differ in whether they lexicalize just the core functional projection ((14)a), or just the adverbial functional projection ((14)b), or either one or both ((15)):

(14)a. I'-po'-pîî-tu'ka-'pî-i-ya (Macushi – Abbott, 1991,113ff)

3-whip-Asp_{iter}-**Asp**_{finally}-Past-3-Erg

b. he **finally** whipped him (English)

(15)a. It **may** be worth the risk

b. It's **possibly** worth the risk

c. It **may possibly** be worth the risk

In the present context, whether order is already present in narrow syntax (Kayne 1994) or is introduced in the mapping to PF (Chomsky 1995, §4.8; 2008, 7; 2013) is not crucial. What is crucial, given the LCA (also tentatively taken by Chomsky 2007, 10 to determine linearization “in the mapping to the SM interface”), is that underlying the two linear orders there are two different hierarchical structures built derivationally in narrow syntax.¹⁷

Let us consider the simplified structures of Merge in (9)a-b to tentatively sketch the kind of consistent types of movements which appear to lead to the two ideal head-initial and head-final orders.¹⁸ As noted, actual languages (very possibly, all languages) depart from these ideal types to varying degrees, which are arguably a function of different combinations of the very same types of movements (see below).

¹⁷ Pair Merge, which introduces linear order in narrow syntax (Chomsky 2000), under the Strong Minimalist Thesis (SMT) should perhaps be dispensed with. Cf. Chomsky (2013, 40ff), Oseki (2015). If the LCA is abandoned (as “it involves significant departures from SMT”, Chomsky 2007, 10), it is not clear how the generalizations concerning word order discussed here can be captured.

¹⁸ It is not important here to review the evidence for the richer ordered sequences of elements in the clause and in each of the other phrases discussed in the recent literature. See, for example, the sequencing of different types of complementizers (Rizzi 1997; Benincà and Munaro 2010), that of Mood, Modal, Tense, Aspect and Voice elements in the clause (Cinque 1999, 2006), that of the different functional (including adjectival) projections in the nominal phrase (Scott 2002, Svenonius 2008, Cinque 2005b, 2010), the prepositional phrase (Cinque 2010b and Rizzi and Cinque 2016), and the adjectival phrase (Rizzi and Cinque 2016).

To briefly give ahead the basic idea, the different assumptions involved in the derivation of the two hierarchies (ultimately *orders* under the LCA) are the following (illustrated in section 3.1 with the head-initial type and 3.2 with the head-final one):¹⁹

(16)a. VPs, VoicePs, AspPs, TPs, ModPs, MoodPs, CPs for the verbal extended projection (the clause) and NPs, NumberPs, DPs, CasePs for the nominal extended projection are the functional projections which 1) label the Syntactic Object (SO) in the (External or Internal) {XP,YP} Merge²⁰; 2) select one of the other functional phrases, attract it in the *whose-pictures* pied piping mode (yielding the ideal head-initial type) or the *pictures-of-whom* pied-piping mode (yielding the (ideal) head-final one), and then move with the same pied piping mode.²¹

b. the paired non core adverbial projection of the core projections VoiceP, AspP, etc. is merged on top of the core ones after the movements of the latter.

Let us then consider the two cases in turn (needless to say, at this stage, any proposal can only be programmatic in character, and tentative).

¹⁹ These will be based for simplicity on traditional X-bar representations, where only the higher segment will be labeled: [_{FP} XP [F]]). As far as I can see, the Merge and Move derivations to be proposed are compatible with Kayne's (2016) idea that heads are necessarily silent, and potentially also compatible with a system adopting Merge and Labeling, as that presented in Chomsky (2013) and Rizzi (2016; this volume).

²⁰ This is a minimal extension of the labeling conventions of Chomsky (2013) and Rizzi (2016, this volume) in a system like that of Kayne (2016), where all heads are silent, and yet the segregation of traditional functional 'heads' and traditional phrases in the (ideal) head-initial and head-final languages has to be captured.

²¹ Here I assume a version of the traditional notion of pied piping (Ross 1967, §4.3), "whereby some particular movement operation T, designated to displace an element A, ends up moving some constituent B that properly contains A." (Horvath forthcoming, section 1). There are essentially two types. In one (the *whose-picture* pied piping type), A, the constituent that drives the movement, is the highest specifier of B, the larger constituent that moves. In the other (the *pictures-of-whom* pied-piping type), A, the constituent that drives the movement, is the lowest phrase of B, the larger constituent that moves. It is sometimes assumed that the larger constituent B inherits, by upward percolation, the feature of A that drives the movement. Here what drives the movement is not the *wh-* feature but, we may assume, the +V or +N feature borne by the verbal and nominal functional projections mentioned in (16)a. Later we shall see that the *pictures-of-whom* pied-piping is possibly more marked than the *whose-picture* pied piping. Later I also consider a third (apparently even more marked) type of movement: that of the nucleus (VP or NP) *without pied piping*, which yields such "less popular" (Greenberg 1963,87) orders as N Dem Num A and V Mood Tense Aspect (Cinque 2014,238f). Pied piping is generally optional (unless required to prevent some violation, e.g. of the Left Branch Constraint). In the derivation of all word orders except the "less popular" ones just mentioned it is however obligatory; something that remains to be understood. See fn.32 below for some discussion. For insightful discussion on classical pied piping and more recent alternative formulations which do away with feature percolation, see Horvath (forthcoming).

3.1 The “head-initial” type.

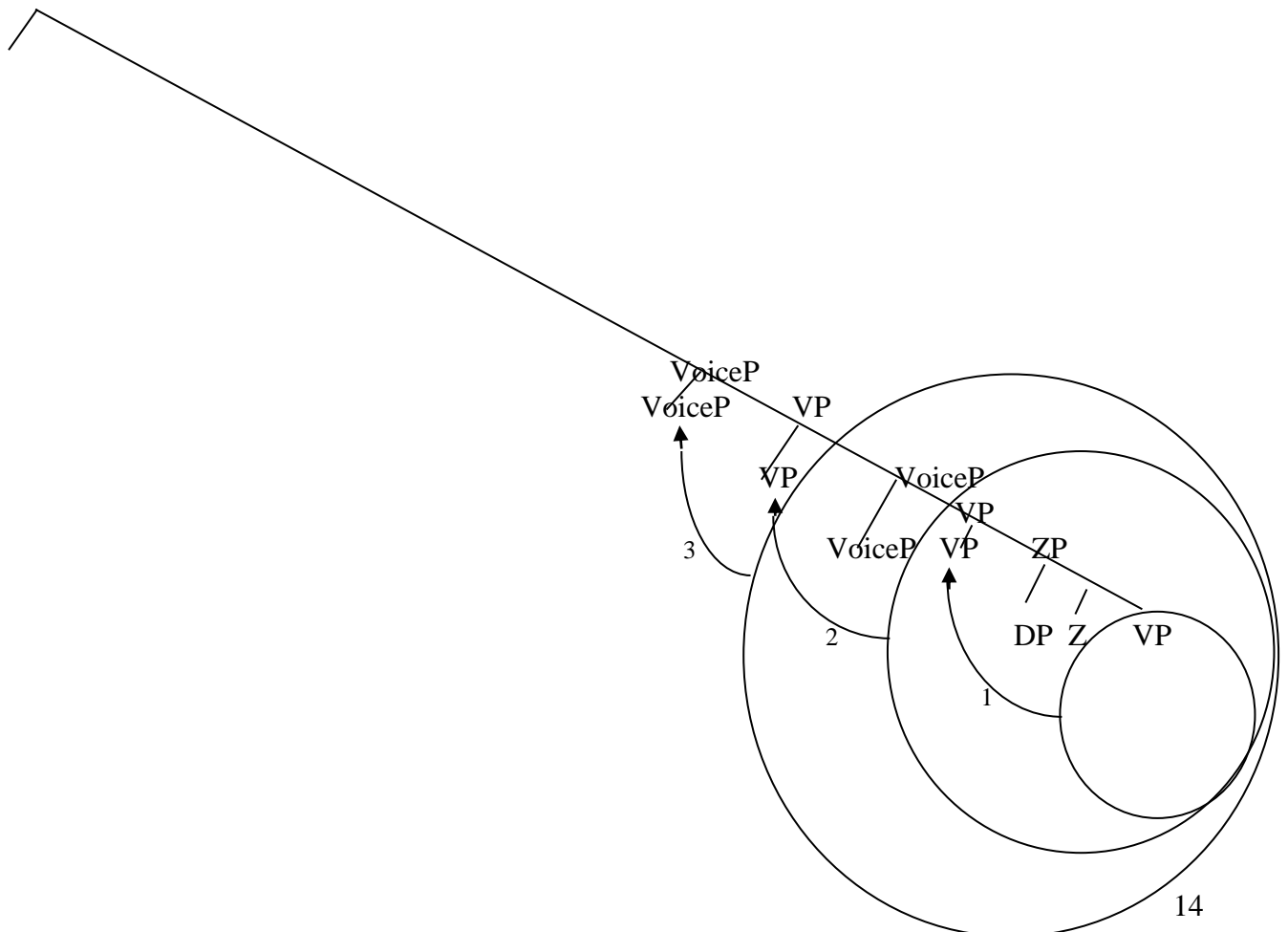
Recall the generalization concerning the “head-initial” word order type: **all higher (functional) heads precede V/N/etc. in their (hierarchical) order of Merge, and phrasal specifiers (arguments, circumstantials, and modifiers) follow V/N/etc. in an order which is the reverse of their (hierarchical) order of Merge. See the simplified (17)a-b:**

(17)a. C Mod_{epistemic} V AdvP_{manner} AdvP_{epistemic}

b. D PL N AP_{manner} NumP

Let’s consider first the order in (17)a. This can be achieved, as shown in (18)-(20). First VP moves with (vacuous) *whose-pictures* pied piping above the (object) DP, and labels the new SO as VP (by (16)a1); then the next functional projection selecting VP (say, VoiceP) is merged, and labels the new SO VoiceP (by (16)a1). This is followed by movement of the selected VP and by the subsequent movement of VoiceP with the same pied piping mode (by (16)a2):

(18)

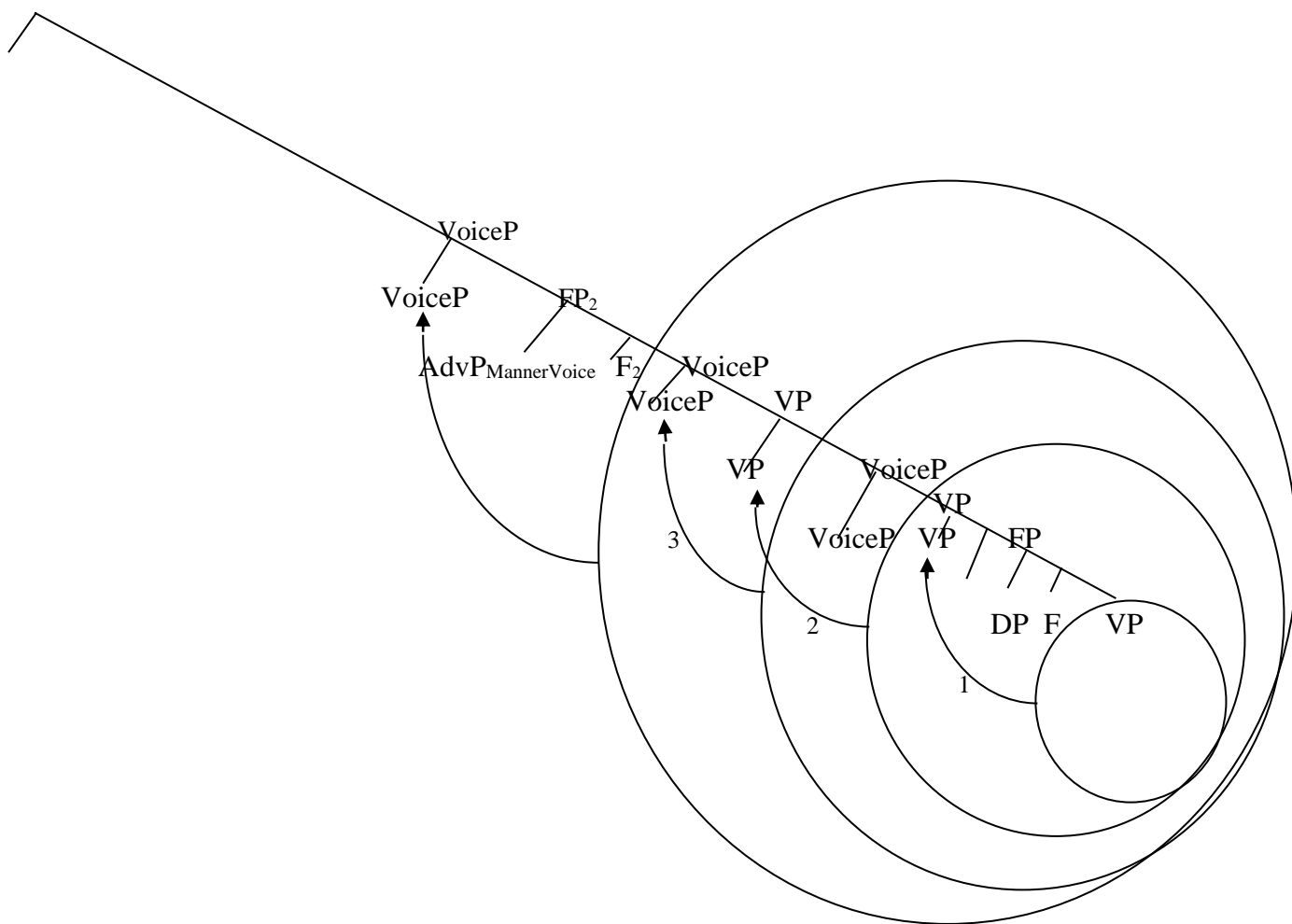


This generalizes Kayne's (1999, 2003a, §4.5) derivation of the infinitival complementation of (functional) verbs like *try* in English, which restores the original hierarchical relation between the functional and the lexical verb (also see Koopman and Szabolcsi 2000):

- (19)a try leave (merger of K) →
- b K try leave (movement of InfinP to Spec,K) →
- c leave_i K try t_i (merger of P/C) →
- d to leave_i K try t_i (movement of VP to Spec,P/C) →
- e [try t_i]_j to leave_i K t_j

At this point the non core adverbial projection paired with VoiceP, AdvP_{MannerVoice},²² is merged, followed by movement of VoiceP above it in the *whose-pictures* pied piping mode, and labeling of the new SO as VoiceP, as shown in (20)a.:

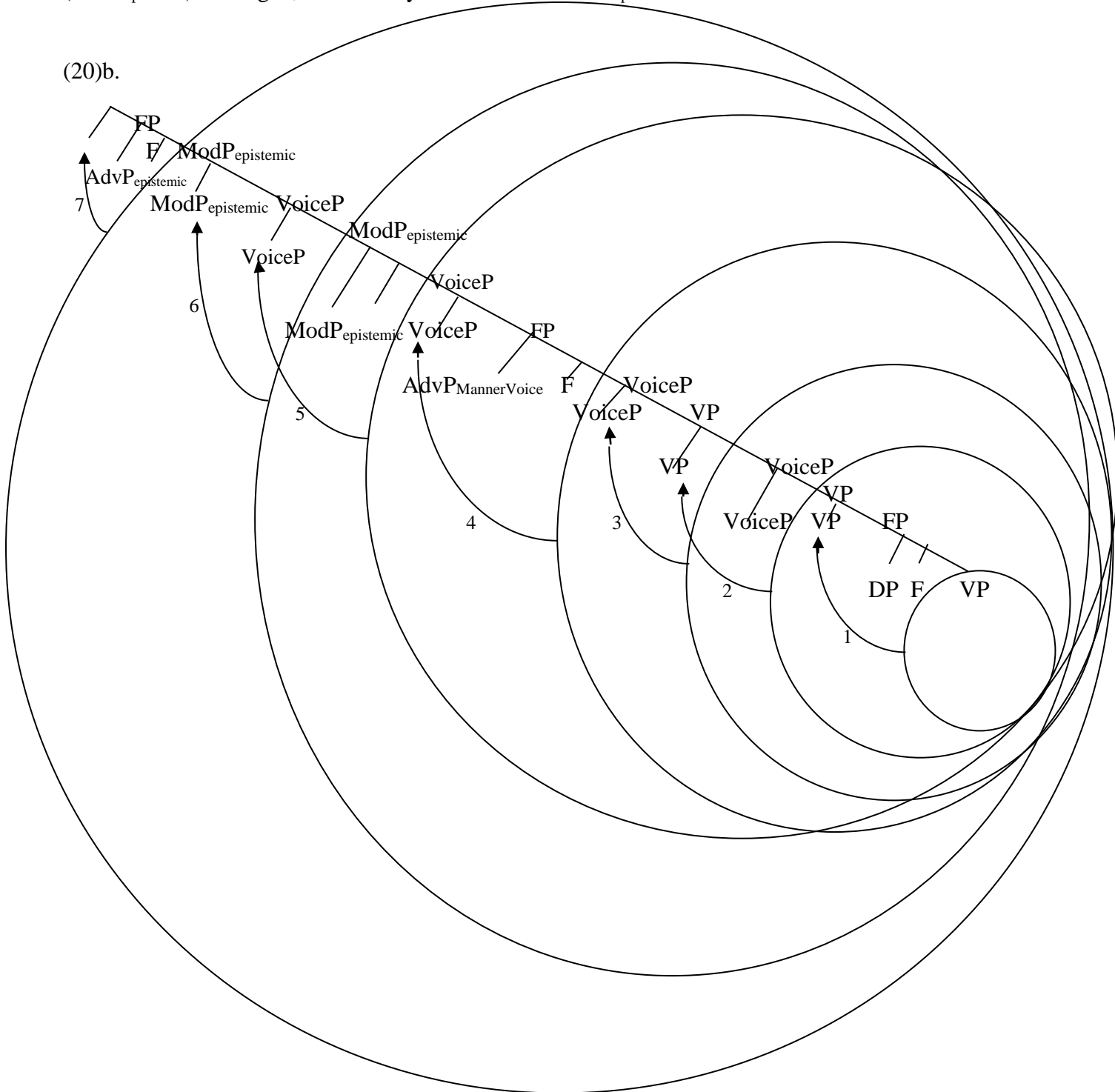
(20)a.



²² Cf. Lees' and Chomsky's "generalization that relates Manner Adverbials to passivization" (Chomsky 1965,218note28) (i.e. "the restriction of passivization to Verbs that take Manner Adverbs freely" - Chomsky 1965,104).

The order that the LCA would obtain from the hierarchical structure built so far is V DP AdvP_{manner}. At this point the functional projection selecting VoiceP (let's say ModP_{epistemic} for simplicity) is merged, followed by movement with *whose-pictures* pied piping of VoiceP above it and movement with *whose-pictures* pied piping of ModP_{epistemic} above VoiceP, restoring their respective hierarchical position. After that the non core adverbial projection paired with ModP_{epistemic} (AdvP_{epistemic}) is merged, followed by movement of ModP_{epistemic} above it:

(20)b.



From the hierarchical structure so far built the order that the LCA would yield is $\text{Mod}_{\text{epist}} \text{V}$ $\text{advP}_{\text{manner}} \text{advP}_{\text{epistemic}}$, which closely corresponds to the order of elements in the VSO language Peñoles Mixtec below (modulo PAST for $\text{ModP}_{\text{epist}}$):²³

- (21) ní šitu baʔa naʔi-d (cf. Daly 1973,15)
 PAST plow well probably-he
 ‘He probably plowed well’

Next, CP is merged, which I take for simplicity to select $\text{ModP}_{\text{epistemic}}$, and the same movements eventually yield the overall order $\text{C Mod}_{\text{epist}} \text{V AdvP}_{\text{manner}} \text{AdvP}_{\text{epistemic}}$, which appears to be the order of consistent head-initial languages.

The derivation of head-initial nominal phrases proceeds similarly, yielding the overall order $\text{D PL N AP}_{\text{manner}} \text{NumeralP}$, which closely corresponds to the order of elements in the nominal phrase of, for example, VSO Tahitian (Oceanic):

- (22) te mau ‘ānani para (Pearce 2012,85)²⁴
 Art PL orange ripe
 ‘the ripe oranges’

²³ If movement obtains without pied piping (an option that is also available in some languages – cf. fn.21 and section 4 below) the illusion is created that a head may cross over another head in apparent violation of the ‘Head Movement Constraint’. This may be welcome for those languages (like Bulgarian) which appear to move an auxiliary over a higher one, in so called “Long Head Movement”, presumably to an \bar{A} -position ((i)) (cf. Embick and Izvorski 1994):

- (i) Bil_i sām t_i kupil knigata
 been am.I bought book.the
 ‘I have allegedly bought the book’

The movement of the second auxiliary (phrase), *bil* ‘been’, in (i), is one of the ways in which one can satisfy the requirement that the clitic auxiliary *sām* not be in first position (other options consist in having another phrase precede it, with different pragmatic effects (cf. Lambova 2004, Chapter 5), as in (ii)).

- (ii)a. Az sām bil kupil knigata
 I am.I been bought book.the
 b. kupil sām bil knigata
 c. knigata sām bil kupil
 ‘I have allegedly bought the book’

²⁴ Numerals in Tahitian follow adjectives. Cf. Ruhlen (2008,1316).

Subject, complements, and circumstantial DPs, which I take to be merged above VP/NP in the order DP_{time} DP_{location} .. DP_{instrument} .. DP_{manner} DP_{agent} DP_{goal} DP_{theme} V^o, in head-initial languages surface in the reverse order, shown in (23), owing to the roll-up derivation (after raising to higher licensing positions):²⁵

(23) V^o DP_{theme} DP_{goal} DP_{agent} DP_{manner} .. DP_{instrument} .. DP_{location} DP_{time}

The order in (23) is again tentatively reconstructed from the order of arguments and circumstantials in more rigid verb-initial languages (see, for example, Massam 2000,98 on Niuean and Sells 2000,124 on Pangasinan).²⁶ There may be more than one (specialized) licensing position for each DP, as shown by the Malagasy example in (24), from Rackowski and Travis (2000, §1.3), where the object DP can occur in different places among the adverbs (depending on the position it reaches before the reversal operated by the raising of the (extended) VP with *whose-pictures* pied piping). These different positions may correlate with distinct semantic interpretations (cf. Diesing 1992).

(24) Tsy manasa tsara foana <ny lamba> intsony <ny lamba> mihitsy <ny lamba> Rakoto
 NEG PRES.AT.wash well always <DET clothes> anymore <DET clothes> at.all <DET clothes> R.
 ‘Rakoto does not wash at all any longer always well the clothes’

3.2 The ideal “head-final” type.

Recall the generalization concerning the ideal head-final word order type: **all higher (functional) ‘heads’ follow the lexical V/N/etc. in an order which is the reverse of the (hierarchical) order of Merge, and phrasal specifiers (arguments, circumstantials, and modifiers) precede V/N/etc. in their (hierarchical) order of Merge (see the simplified (8)a.,a’. and b.,b’).**

The functional projections of the ideal “head-final” languages move with the *pictures-of-whom* pied-piping. Starting from a Merge structure like (9)a., the order in (8)a. can be achieved as indicated in (25).²⁷ After the merger of the complement DP, VP labels the dominating projection FP

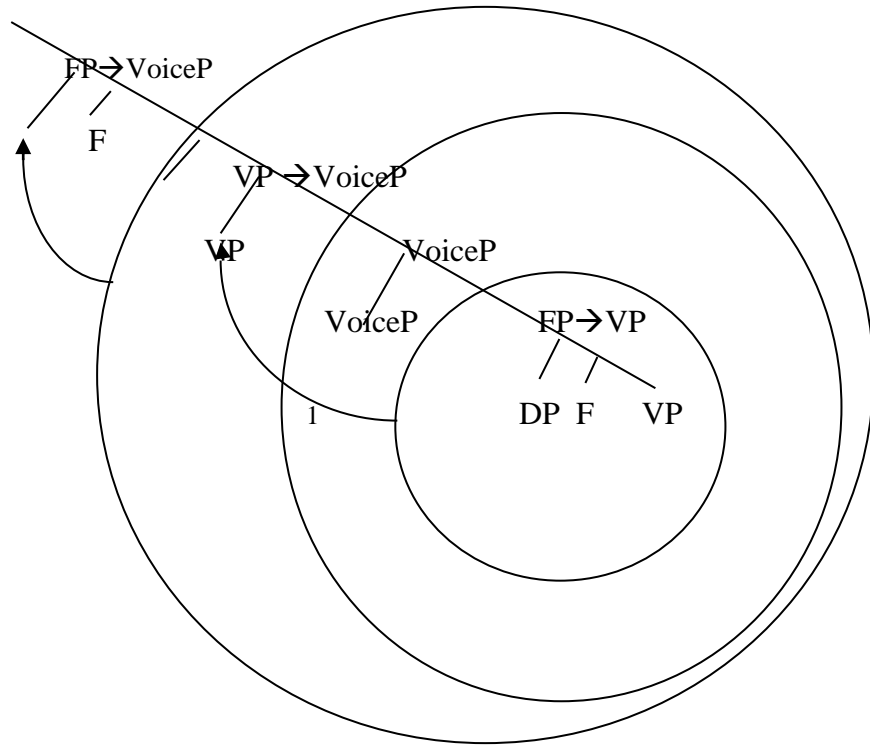
²⁵ It is interesting to note that virtually the same order/hierarchy of (23) appears to hold DP-internally in English complex nominals (Rae 2009) and, modulo the mirror-image order, with Romance relational adjectives (Bortolotto 2015), pointing to deep seated scope relations among these arguments and circumstantials.

²⁶ To judge from Schweikert (2005b) and Takamine (2010) circumstantial PPs are actually merged in specific points within the sequence of the adverbs (... DP_{temporal} AdvP₃ AdvP₂ DP_{locative} AdvP₁ DP_{manner} V^o).

²⁷ This generalizes the derivation of agglutinative morphology in head-final languages sketched in Kayne (1994,§5.5):
 ...X [Y_P... Y ZP]... → ...X [Y_P ZP Y t]... → [Y_P ZP Y t_{ZP}] X t_{YP}

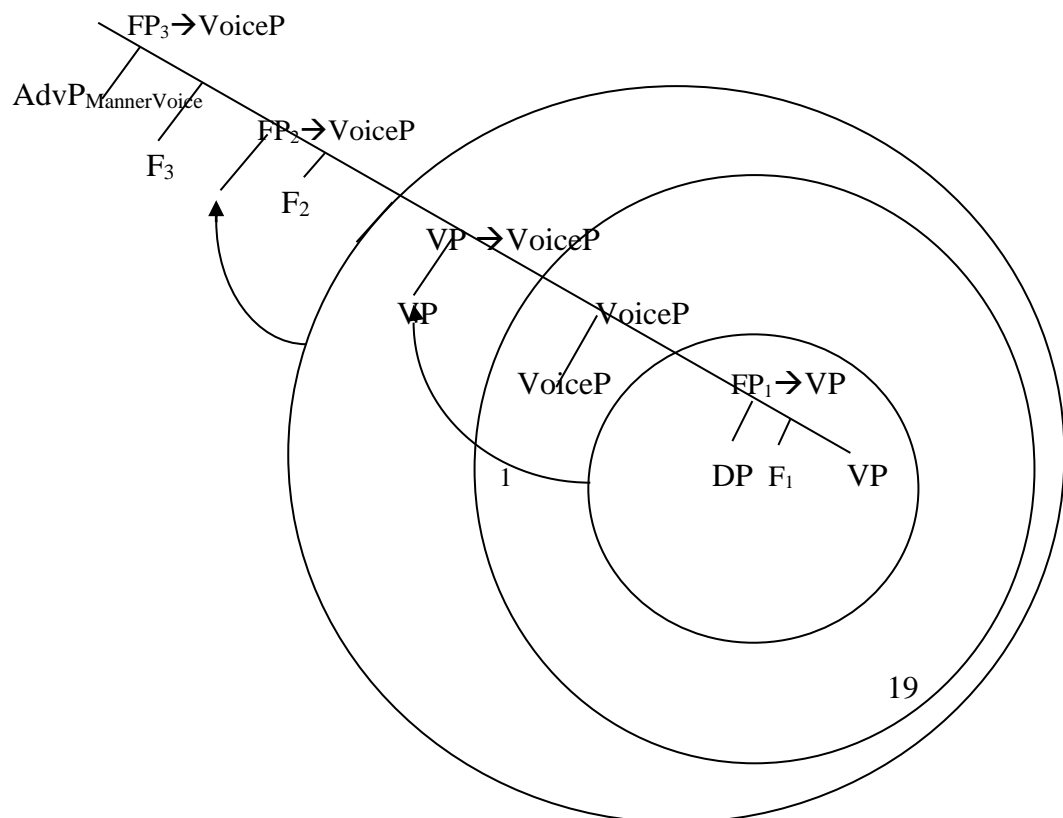
by percolating its label under the *pictures-of-whom* pied piping mode. Then VoiceP is merged and is attracted above it, after which VoiceP percolates its label to VP under the *pictures-of-whom* pied piping mode and moves labeling the new projection as VoiceP:

(25)a.



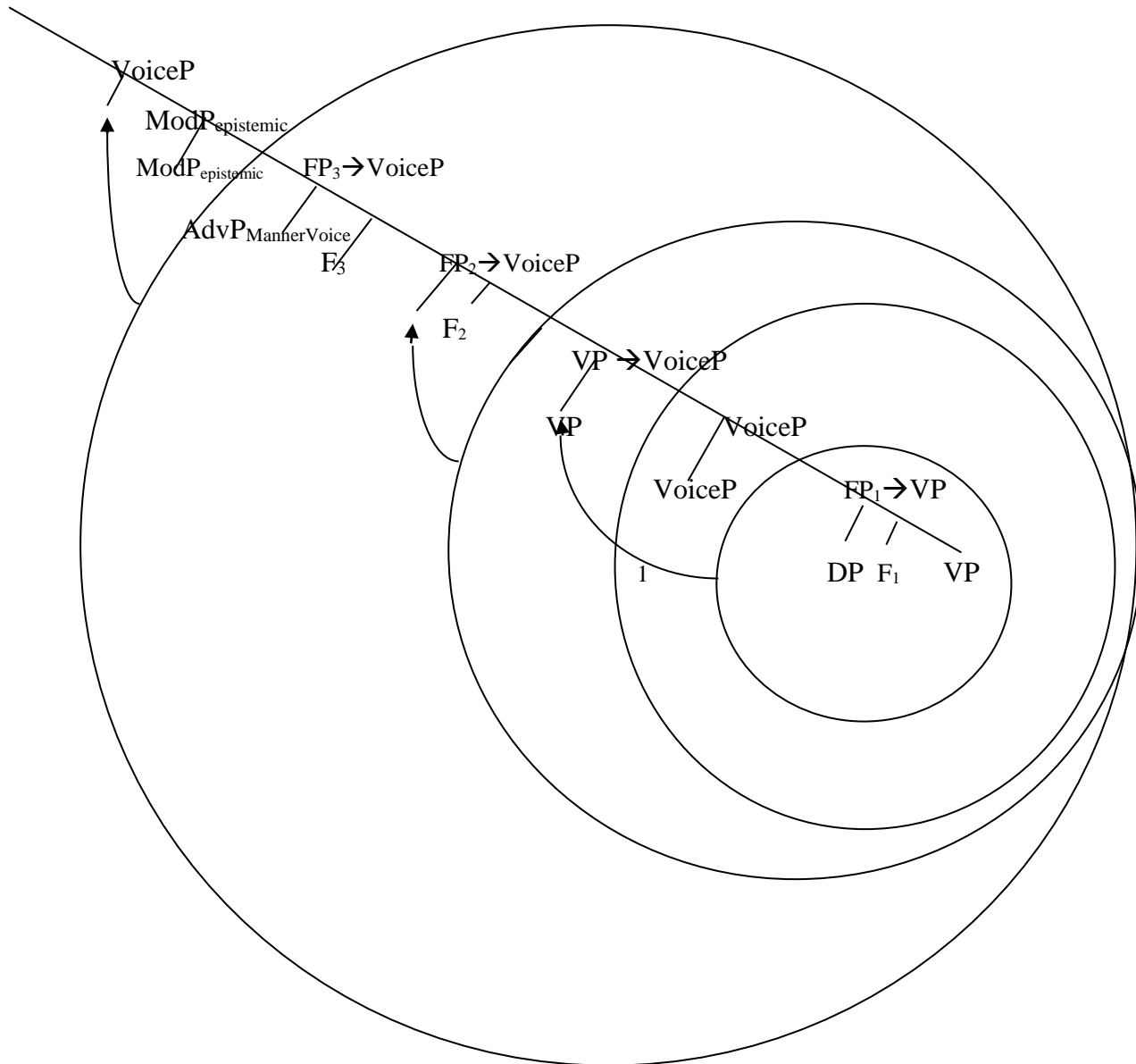
This step is followed by the merger of the non core adverbial projection paired with VoiceP, namely $AdvP_{MannerVoice}$, after which VoiceP percolates its label under the *pictures-of-whom* pied piping mode:

(25)b.

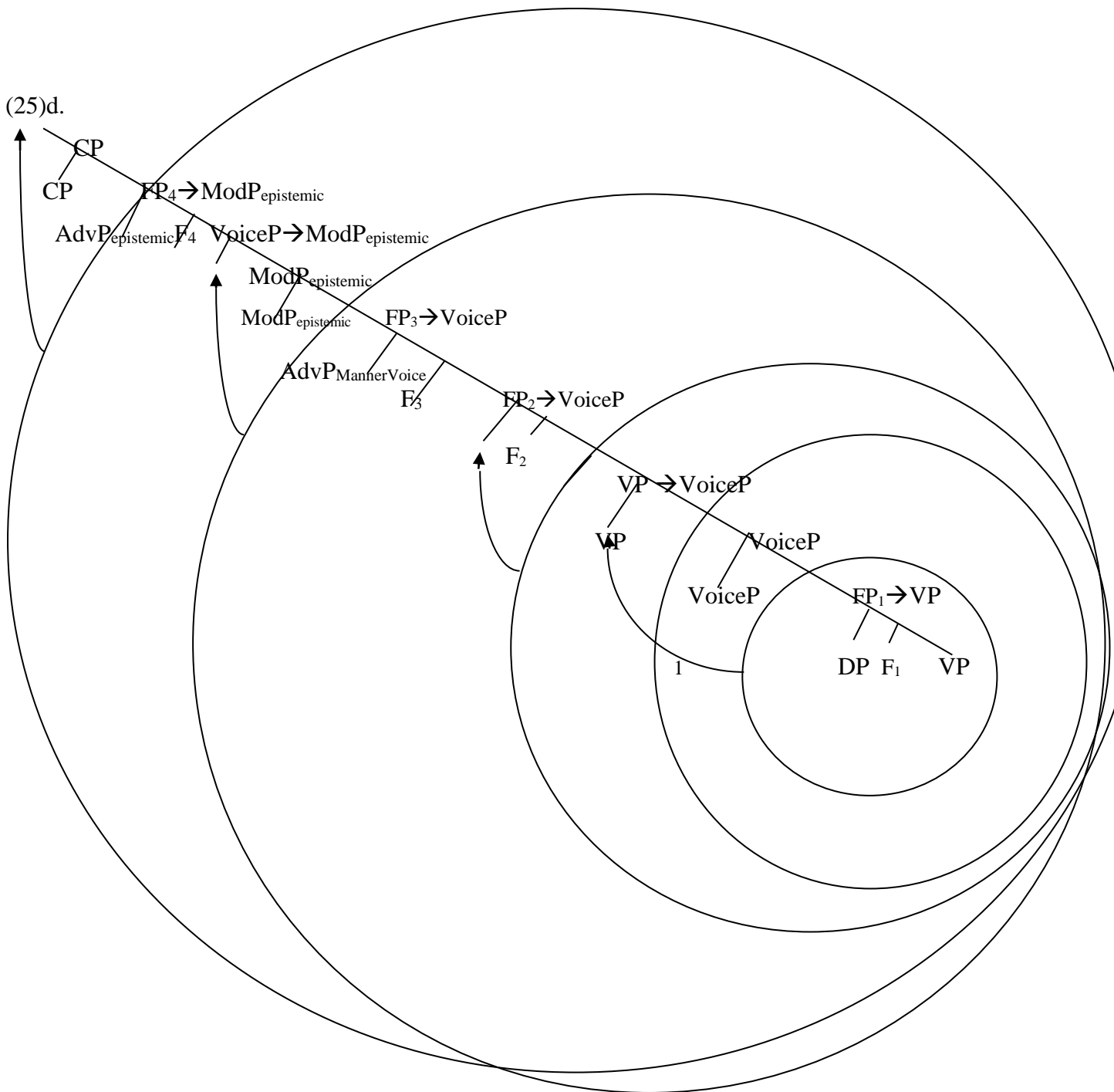


Next the functional projection selecting VoiceP, say, again, $\text{ModP}_{\text{epistemic}}$, is merged and VoiceP is attracted above it:

(25)c.



After that $\text{ModP}_{\text{epistemic}}$ percolates its label to VoiceP followed by merger of the non core adverbial projection paired with it, $\text{AdvP}_{\text{epistemic}}$. Once the next higher selecting functional projection CP is merged $\text{ModP}_{\text{epistemic}}$ is attracted above it in the *pictures-of-whom* pied piping mode, followed by the percolation of the CP label and movement of CP with the *pictures-of-whom* pied piping mode:



Under the LCA this derivation yields the linear order: **AdvP_{epistemic} AdvP_{manner} DP V Mod_{epistemic} C**, with segregation of the modifier phrases (in their order or Merge) to the left of V, and of the ‘heads’ (or rather the corresponding phrasal projections) to the right of V. Cf. the Japanese example in (3)b., repeated here as (26):

- (26) Watasi-wa [kare-ga **osoraku** sore-o **zyoozuni** **okona-e-ru** **to**] it-ta.
 I-Top [he-Nom probably it-Acc well do-Mod-Present that] say-Past
 ‘I said that probably he can do it well’

The derivation of the ideal head-final nominal phrases follows comparable lines, yielding under the LCA the order NumP AP_{manner} N PL D Case. Cf. the Wolaytta example (4)b, repeated here as (27), with PL and Case:

- (27) he [taa- w kuttuw^a ehida] **iccash^a adussa laagge-t-I**
 those me-dat chicken having-brought **five tall friend-PL-NOM**
 ‘those five tall friends who brought me a chicken’

Subject, object, and circumstantial DPs, when present, raise to higher licensing positions and are dragged along by the functional projections in the *pictures-of-whom* pied piping mode.²⁸ They thus surface in the same relative order in which there were merged, which is arguably the order in (28) (cf. Schweikert 2005a and Takamine 2010):²⁹

- (28) DP_{time} DP_{location} .. DP_{instrument} .. DP_{manner}... DP_{agent} DP_{goal} DP_{theme} V

My tentative conclusion then is that heads can indeed be silent across the board (as in Kayne 2016), and that the apparent segregation of the traditional functional heads on one side of VP/NP and of argumental, circumstantial and adverbial phrases on the other, can be achieved by distinguishing core functional projections (what we were used to call heads) from the non core adverbial projections paired with them, arguments and circumstantial PPs.

²⁸ In case a DP has to be licensed by a P, I will assume that it, rather than the remnant (as in head-initial languages), raises to Spec,P, after raising to Spec,K to check its Case. See Cinque (2013a, §2.4.2)

Particularly telling in this regard is the distribution of PPs in nominal phrases of head-initial and head-final languages. In Cinque (2005b, fn.34; also see Cinque 2010, chapter 6, note 14)), it is observed that prepositional phrases are final in the DP of head-initial languages, while postpositional phrases are initial in the DP of head-final languages (which appears to betray the higher merger of P, as in Kayne 2000, obscured in head-initial languages by the movement of the remnant).

(i) a **PP** Dem Num A N (Armenian, Hindi, Malayalam, Tatar, Turkish, etc.) vs.

b N A Num Dem **PP** (Gungbe – Enoch Aboh, p.c.)/N Dem Num A **PP** (Kîtharaka - Muriungi 2006,36)/Dem Num A N **PP** (English, Bulgarian)

For recent discussion see Atlamaz (2016) and, for a non movement approach which aims at capturing the same generalizations, Adger (2013).

²⁹ Order preservation may ultimately be a consequence of Relativized Minimality. See Krapova and Cinque (2008, §7) and references cited there of the analogous order preservation with multiple *wh*-phrases in Bulgarian, which develops certain suggestions of Chomsky’s and Rizzi’s. Also see Haegeman (1993) on scrambling in West Flemish, which preserves the order of Merge of SU, IO and DO within a single clause.

3.3 The ideal orders, cross-category harmony, and actual orders.

As mentioned several times, the derivations just reviewed yield the (reconstructed) ideal head-initial and head-final orders through successive attractions of the verbal and nominal projections via uniform *whose-pictures* or *pictures-of-whom* pied pipings. However, the bewildering variation in (canonical) word orders found in the languages of the world clearly involves different departures from these simple derivations (a daunting task to address).

Within the present perspective, a quite common departure from such uniform derivations resides in the presence of opposite values in the mode of pied piping for the verbal and the nominal extended projections. For example the Trans-New Guinea language Bargam (like several other Papuan languages) is head-final in the verbal extended projection (in fact, quite strictly so) and in the PP (it is postpositional), but head-initial in the nominal extended projection:

(29) Bargam (Papuan (Trans-New Guinea) – Hepner 2006)

- a. AdvP Subj PP Obj V (head-final)
- b. N AP NumP DemP (head-initial)

Many Mayan languages, like Tzutujil in (30), show the reverse situation, being head-initial in the verbal extended projection and head-final in the nominal one:

(30) Tzutujil (Mayan (Qichean) VOS – Dayley 1985)

- a. V Obj Subj AdvP PP (head-initial)
- b. DemP NumP AP N (head-final)

Yet, some clear tendencies of different strength are observable.

3.3.1 Harmony of heads within the same extended projection is rather strongly obeyed.

As apparent from Dryer (1992) (also see Biberauer, Holmberg and Roberts 2014, §3), modal verbs, auxiliaries and subordinating conjunctions are predominantly verb patterners. They predominantly follow the verb in OV languages and predominantly precede the verb in VO languages. See (31), (32) and (33), from Dryer (1992, 94, 100, and 103):

(31)a. **OV and V modal (want): 29**

b. **VO and modal (want) V: 42**

- c. OV and modal (want) V: 10
- d. VO and V modal (want): 4

(32)a. OV and VAux: 36

- b. VO and AuxV: 28
- c. OV and AuxV: 3
- d. VO and VAux: 4

(33)a. OV and IP Sub: 38

- b. VO and Sub IP: 59
- c. OV and Sub IP: 17
- d. VO and IP Sub: 1

3.3.2 Harmony of modifiers within the same extended projection is also fairly strongly obeyed.

In the nominal extended projection (see (34), from the larger sample of Cinque (in preparation)), the consistent a. and b. cases involve many more genera and languages than the disharmonic ones (from c. to p.).

(34)a. N A Num Dem: 462 languages; 120 genera

- b. Dem Num A N: 339 languages; 106 genera**
- c. Dem N A Num: 143 languages; 70 genera
- d. Dem Num N A: 133 languages; 53 genera
- e. Num N A Dem: 198 languages; 49 genera
- f. N A Dem Num: 85 languages; 31 genera
- g. N Num A Dem: 50 languages; 28 genera
- h. Dem N Num A: 41 languages; 25 genera
- i. Dem A N Num: 40 languages; 24 genera
- l. N Dem Num A: 57 languages; 20 genera
- m. Num A N Dem: 46 languages; 19 genera
- n. N Dem A Num: 26 languages; 18 genera
- o. A N Num Dem: 26 languages; 11 genera
- p. A N Dem Num: 16 languages; 6 genera

To judge from Dryer (1992,123) (see 35), the position of AdvP and PP modifiers with respect to the verb in the clause also tends to be harmonic:

(35)a. **PP-V and Adv-V: 42 genera**

 b. **V-PP and V-Adv: 36 genera**

 c. PP-V and V-Adv: 1 genus

 d. V-PP and Adv-P: 6 genera

3.3.3 Harmony across different extended projections seems to be more strongly obeyed by ‘heads’ with respect to their complements than by ‘heads’ with respect to their modifiers.

For example, if one composes the features “order of object and verb” and “order of adposition and NP” or those of “order of object and verb” and “order of genitive and noun” in the interactive tool of the World Atlas of Language Structures (WALS Online), the cross-categorical harmony between the extended projections of VP and PP and VP and NP with respect to heads and their complements (to the extent that N Gen includes genitive complements of the noun in addition to genitive subjects) appears fairly robust. See the figures in (36) and (37):

(36)a. **OV and OP: 427 languages**

 b. **VO and PO: 417 languages**

 c. VO and OP: 38 languages

 d. OV and PO: 10 languages

(37)a. **O V and Gen N: 434**

 b. **V O and N Gen: 352**

 c. V O and Gen N: 113

 d. O V and N Gen: 30

And even if no comparable composition of the feature “order of object and verb” with “order of adjective and complement” is available from WALS, it seems not too far-fetched to hypothesize that a similar harmony obtains (at least to judge from a number of OV languages, which have

PP/DP A as their canonical order, and, conversely, from a number of VO languages, which have A PP as their canonical order).³⁰

3.3.4 Harmony across different extended projections is instead much weaker (if present at all) when heads and their modifiers are considered.

Compare for example the order of P and its complements and the order of the N and its genitive objects just reviewed, which align fairly well with the order of the verb and its complements, with the figures in WALS Online for the composition of the features “order of object and verb” and “order of adjective and noun” ((38)) or “order of numeral and noun” ((39)), as well as (29) and (30) from Bargam and Tzutujil above:

(38)a. OV and AN: 201 languages

b. VO and NA: 404 languages

c. OV and NA: 287 language

d. VO and AN: 100 languages

(39)a. OV and Num N: 180 languages

b. VO and N Num: 246 languages

c. OV and N Num: 230 language

d. VO and Num N: 208 languages

Note that it would not do to assume that nominal modifiers are adjuncts, rather than specifiers, and as such are outside the perview of the headedness parameters; this is because within the nominal extended projections they largely follow the relevant headedness parameter, as shown by the fact that (34)a. is the predominant order of rigid head-initial languages and (34)b. the predominant order of rigid head-final ones.

Similarly for adjectives (in predicate position), whose order with respect to their PP complements appears to show more cross-category harmony than their order with respect to modifiers. For example, the combination of OV and VO with the order of degree word and adjective shows only rather weak cross-category harmony. See (40) from WALS Online:

³⁰ Also see Greenberg’s (1963) Universal 22 on the order of adjective and (the adjunct) [marker + standard]. Characteristically languages with postpositions have [standard + marker] > adjective (‘that than clear(er)’) while languages with prepositions have adjective > [marker + standard] (‘(more) clear than that’).

- (40)a. OV and Degree word-Adjective: 114
- b. VO and Adjective-Degree word: 102
- c. VO and Degree word-Adjective: 81
- d. OV and Adjective-Degree word: 63

Nonetheless, cases of disharmony obtain even within the same extended projection; in the verbal extended projection, with auxiliaries, modals and complementizers. See section 4, below, for some examples, and the general discussion in Biberauer, Holmberg and Roberts (2014), where it is however noted that some orders are never, or very rarely, found (e.g.(42), as opposed to (41)):

- (41)a. Aux [O V]
- b. C [O V (Aux)]

- (42)a. (*)[V O] Aux
- b. (*)[(Aux) V O] C

They propose that such cases as (42) fall under their Final over Final Constraint (FOFC), itself arguably following from more general principles. Even if there turned out to exist genuine exceptions to the FOFC³¹, the generalization holds quite clearly and must be captured.

In the present context, another way to understand the FOFC is in terms of the more marked character of the *pictures-of-whom* pied piping as opposed to the *whose-pictures* pied piping³², to the

³¹ See the apparent SVOAux orders of Kokama-Kokamilla (Tupí-Guaraní) ((i), from Vallejos Yopán 2010,§7.3.3.1)

(i) tsa=mama tseneta kanata ukua=tsuri penu=yaki=ka
 1SG.F=mama turn.on fire HAB=PAST.AUX 3PL=head=LOC
 ‘My mother used to turn on the light close to our heads’

and the case of an apparent final complementizer in the head-initial Southern Khoisan language East !Xóõ, mentioned in fn.31 and section 2.7 in Cinque (2013a).

³² This is shown 1) by the contrast between the two in English embedded (see (ii)) vs. matrix (see (i)) contexts:

(i)a. Whose pictures did you see?
 b. Pictures of whom did you see?
 (ii)a. I wonder whose pictures you saw.
 b. *I wonder pictures of whom you saw.

2) by the skewing toward the *whose-pictures* pied piping shown by the higher number of VO languages wrt OV languages (if one adds together the number of SVO, VSO and VOS languages, vs. that of SOV, OVS, and OSV in WALS – cf. (iii) below and the percentages of these types in Tomlin 1979, Mallinson and Blake 1981 and Cysouw 2008, reported in Cinque 2013a,§2.8):

effect that change of pied piping from the more marked *pictures-of-whom* type to the less marked *whose-pictures* type (Aux [O V], C [O V (Aux)]) is an admitted departure, while the reverse ([V O] Aux), [(Aux) V O] C] is not (or is highly disfavored).

In the nominal extended projection, disharmony is observable in the 12 attested orders of nominal modifiers other than the consistent head-final Dem Num A N and head-initial N A Num Dem (see (34) above).

Another, less common, departure from the uniform attractions leading to the ideal head-initial and head-final orders is attraction without pied piping, where the VP or NP moves by itself, without dragging along other material (cf. the notion of ‘complexity filter’ of Koopman and Szabolcsi 2000 and Koopman 2014).³³ In the nominal extended projection this yields, as noted, the “less popular” (Greenberg 1963,87) order (43)a; in the verbal extended projection V-medial Italian ‘head-final’ order of certain postverbal adverbs ((43)b) rather than the ‘head-initial’ mirror-image one of Malagasy ((43)c).

(43)a. N Dem Num A (Greenberg 1963,87)

b. V > mica > più > sempre > completamente > bene (Italian - Cinque 1999,Chapt 1)
‘negation’ > ‘anymore’ > ‘always’ > ‘completely’ > ‘well’

c. V > tsara > tanteraka > foana > intsony > mihisty (Malagasy - Rackowski and Travis 2000,§1)
‘well’ > ‘completely’ > ‘always’ > anymore > ‘negation’

V2 may be another case (in both head-initial and head-final languages).³⁴ Other deviations from the ideal orders are (briefly) discussed in Cinque (2013a,§2.6).³⁵ In any case, as already noted, the

(iii) SOV	SVO	VSO	VOS	OVS	OSV
497	435	85	26	9	4

and 3) by the higher number of genera of N A Num Dem languages in (34) above (which also putatively involves *whose-pictures* pied piping) vs. Dem Num A N languages (putatively involving *pictures-of-whom* pied piping).

As Luigi Rizzi observed (p.c.) the *pictures-of-whom* pied-piping involves a more complex upward percolation than the *whose-pictures* pied piping (which can be thought of as a result of independent relations: Spec,Head agreement and projection).

³³ The unmarked character of pied piping as opposed to the marked character of the variant without it may possibly find a natural account in Chomsky’s (2013) and Rizzi’s (2016, this volume) labeling algorithms. If attraction by non core projections of their core projections and attraction by core projections of their selectees involve feature sharing then unmovability (freezing) of the attracted projection is expected if only maximal projection can move (Rizzi 2016), as the attracted projection is not maximal. Long movement of VP/NP without pied piping must instead not involve feature sharing, with the consequence that VP must keep raising to allow labeling of the projection that hosted it.

³⁴ Actually no single V2 parameter may exist, but rather a number of microparameters (cf. Westergaard 2009).

reconstruction of the two ideal orders and their derivation via *whose-pictures* and *pictures-of-whom* pied piping, beyond their possible general value, may constitute a useful ‘metric’ to locate each language in the space of admitted variation (by considering how many departures from a uniform application of these pied piping modes they involve). The range and limits of this variation remain to be discovered.

4. A micro-parametric approach to word order variation:

4.1 Two puzzles: the inconsistencies of the most rigid types and their minority status.

As noted, the derivation of the ideal head-initial and head-final word orders sketched above involves an absolute uniformity of the pied piping features lexically determined by each projection. However, the actual situation departs from such an ideal picture in two important respects. First, even the most rigid head-final and head-initial languages display a number of inconsistencies; secondly, the very languages which come closest to the ideal types (the “rigid” SOV and the VOS languages) are apparently a minority among the languages of the world, which suggests that an absolutely uniform distribution of pied piping features within and across categories is rare.

Concerning the first aspect, for example, it is observed in the literature that even Japanese, Korean and Tamil, which many authors consider the most rigid head-final languages (cf., e.g., Polinsky 2012), display some non head-final properties, with Japanese and Korean allowing quantifiers and numeral plus classifiers to occur postnominally before a closing case morpheme (Siegel and Bender 2004; Joo 2013)³⁶, and Tamil allowing postnominal universal quantifiers (Annamalai and Steever 1998, 118).³⁷

Greenberg’s (1963, 79) “rigid” subtype of SOV languages, i.e. his group 23.III/Po/GN/AN (p.109), contains additional SOV languages, which also manifest inconsistencies (possibly more numerous

³⁵ A more complex set of departures from the ideal head-final order is provided by Germanic varieties, which display different orders of lexical verbs, modals and auxiliaries, combined with an order of argument and adverbial modifiers that reflects their unique order of Merge (for discussion of the attested orders of verb clusters see, among others, Haegeman and Riemsdijk 1986, Koopman and Szabolcsi 2000, Wurmbrand 2004, Barbiers 2005, Hinterhölzl 2006, Svenonius 2007, Abels 2015). This possibly requires different attractions of the lexical verb, the modals and the auxiliaries with *pictures-of-whom* and/or *whose-pictures* pied piping interspersed with successive evacuation of arguments and adverbials possibly along the lines proposed in Koopman and Szabolcsi (2000), Koopman (2002, 2015b) and Jayaseelan (2010).

³⁶ Also see Cinque (2013a, fn11) for further references to apparently inconsistent properties of Japanese, and Koopman (2015b, §3.1.4.1) on the unexpected NP-*man* (‘only’)-Case vs. NP-P-*man* in Korean.

³⁷ Other postverbal material in Tamil (and head-final languages, more generally) seems instead to involve marked, discourse-related, non canonical orders (focalization, right dislocation, afterthoughts – see Herring 1994, Öztürk 2013a, and references cited there), and may thus not constitute a real disharmony.

than those displayed by Japanese, Korean and Tamil): **Hindi and Bengali**, with initial complementizers (Singh 1977,204 and Bayer 1999,2001), postverbal negative adverbs (Hindi: Bhatt 2007) and postverbal complement clauses (Bhatt and Dayal 2007,291), **Modern Armenian** with different postverbal constituents (Dum-Tragut 2009,§3.5), **Burmese** with postnominal adjectives and numerals (Jones 1970,5; Soe 1999,39), **Yukaghir** with postverbal ‘informationally given’ subjects (Maslova 2003,Chapter 9,§1.5.1), **Ainu**, with predominant prefixation (Bugaeva 2012,461) and Noun Numeral (in addition to Numeral Noun) (Tamura 2000,190), **Sidamo**, with initial coordinating disjunctions (Teferra 2014,§3.7 and §5.5)³⁸, **Nama** with possible postnominal possessives and postverbal objects (Witzlack-Makarevich 2006,§3.3), **Burushaski**, with initial complementizers and postverbal complement clauses (Munshi 2006, §4.4.2), **Harari** with prepositions (in addition to postpositions) (Tosco 1998,357), **Newari** with postnominal quantifiers and some postverbal constituents (Genetti 2007,Chapter 11,§2 and Chapter 14,§4), **Maidu** with alternative VSO orders (Siewierska 1998, endnote 23), **Navaho**, with certain initial subordinators (‘if’), and postverbal adverbs (Speas 1990,278), **Abkhaz**, with postnominal adjectives and quantifiers (Hewitt 1989,59f and 236f), **Quechua**, with certain postverbal infinitival complements and certain postverbal adjuncts (cf.Cole 1982,39ff,113), **Altaic** (Turkic, Mongolic and Tungusic) with various inconsistencies³⁹, like **Paleo-Siberian** (Chukotko-Kamchatkan, Nivkh)⁴⁰, and **Uralic**⁴¹ (for the Ethiopian languages, Chamir, Bedaue, the North Caucasian language Khinalug, and the Papuan language Marind-Anim cited by Greenberg, I could not find relevant information). Comparable inconsistencies are also found in the most rigid **head-initial** languages, VOS (and VSO) languages.⁴² These also display a number of inconsistencies. **Malagasy** (VOS) with preverbal topic and focus phrases (Flegg 2003; Koopman 2015,§4.3.2.1), **Anejom** (VOS) with prenominal indefinite quantifiers (Lynch 1982,§2.5.1), **Fijan** (VOS), with pre-nominal numerals and

³⁸ See Zwart (2005) and references cited there for the relation between OV and ‘final’ conjunctions and VO and ‘initial’ conjunctions, even though in Zwart’s (2009) enlarged sample of 214 languages, head-final languages with initial coordinating conjunctions/disjunctions outnumber head-final languages with final ones 47 to 10.

³⁹ **Turkish** with postverbal constituents (Kural 1997) and postnominal (as well as pre-nominal) relative clauses, **Mongolian** with postverbal constituents (Öztürk 2013b), as well as one common N > proper N order (Poppe 1951,111) and N-Poss alongside Poss-N (Ruhlen 2008,792), **Manchu** with certain postverbal adverbs (Gorelova 1997,105).

⁴⁰ Cf. **Chukchi**, with N A Num Dem orders alongside Dem Num A N orders (Dunn 1999,§9.2), and **Nivkh**, with numerals up to five in postnominal position (Gruzdeva 1998,24).

⁴¹ **Finnish** and Northern **Saami** display initial complementizers (cf. Biberauer, Holmberg and Roberts 2014,194), as do **Hungarian** and **Estonian**; Eastern **Khanty** can have preverbal modals (Filchenko 2007,446), **Nenets** postnominal finite relative clauses (Nikolaeva 2014, Chapter 13), **Enets** some postverbal adverbials (Künnap 1999,32).

⁴² According to Polinsky (2012,§2), in addition to Malagasy, these are Tongan, Irish and most Mayan languages.

certain pre-adjectival degree adverbs (Dixon 1988,144 and §8.3.6), **Seediq** (VOS) with postverbal adverbial subordinators (Holmer 1996,60) and postverbal aspect particles (Holmer 2005,177), **Tongan** (VOS/VSO) with N Dem A Num and N A Dem Num orders (MacDonald 2014,3 and 12f), **Irish** (VSO) with pre-nominal numerals, **Yucatec Maya** (and many other VOS/VSO Mayan languages), with pre-nominal Dem Num A modifiers (Vapnarsky 2011,1421).

Concerning the second respect in which languages appear to depart from the ideal head-final/head-initial orders, we noted above that the languages that come closest to the ideal orders (the rigid SOV and the VOS languages) are a minority among the head-final and the head-initial languages, respectively.⁴³

This makes it plausible to explore a microparametric approach to the derivation of word order, which may simultaneously accommodate the lexical idiosyncrasies, the subregularities and the tendencies which are observable in the languages of the world. The proposal I would like to put forth below, after considering the two kinds of lexical attractions, bears some similarity with Roberts's (2012) idea of 'macro', 'meso', 'micro' and 'nano' parameters, and Baker's (2008) intermediate position between macro- and micro-parameters in his fn.2, but will be cast in purely lexical terms.⁴⁴ In the next two sections I briefly review cases where the mode of attraction appears to be determined by the attractor (section 4.2), and cases where it appears to be determined by the attractee (section 4.3), where the attractors and attractees are single lexical items or lexical items belonging to successively larger classes. Section 4.4 will then consider the implications of the micro-parametric approach for acquisition and for word order typology.

4.2 Cases of movement determined by the modifier.

These cases will be arranged along a scale of successively larger generalizations.⁴⁵

⁴³ The VOS languages, in Hammarström's sample of 5230 languages (cf. Hammarström 2015) are around 3.3% of the totality of languages; the VSO languages reach 9.5%. The SVO languages, which are often quite inconsistent, but still display more head-initial than head-final properties (cf. Dryer 1991), and should thus be classified broadly as (non rigid) head-initial, reach 40.2%, while the SOV languages reach 43.3% (in terms of families SOV however is much more represented). There are unfortunately no figures for the "rigid" ones among the SOV languages, but the almost absolutely consistent ones are very likely also a minority among the SOV languages (possibly just as VOS languages are with respect to the totality of VO languages). See for example the proportion between final and initial coordinating conjunctions in head-final languages reported in fn.38 from Zwart (2005,2009).

⁴⁴ My proposal also differs from theirs in not taking head-initial orders to be unmarked vis-à-vis head-final ones, and in assuming movement plus pied piping to be involved in both head-final and head-initial languages.

⁴⁵ On the role of generalizations (and related exceptions) in language acquisition see Yang (2005,2015).

a) Single lexical item:⁴⁶

In English the adjectival modifier *enough*, which has to follow the adjectives that it modifies (e.g. *good enough*) (Maling 1983,§1.4; Webelhuth 1992,23f; Kayne 2005,§3.6; and references cited there), may be taken to be endowed with a [*whose-pictures* pied-piping] feature which forces the AP, its core projection, to move above it. The other elements belonging to the same class of adjectival modifiers (*very, quite, too*, etc.), which have to precede the adjectives that they modify (*very good, quite good*, etc.), may instead be taken to be endowed with a [*pictures-of-whom* pied-piping] feature, with the effect of not inverting the order of Merge.⁴⁷

The same appears to be true of certain direct modification adjectives in Italian.⁴⁸ *Vecchio* ‘old’ in the sense of ‘long-standing’ is only pre-nominal (hence, in the present context, endowed with a [*pictures-of-whom* pied-piping] feature which does not cause the NP to raise above it - see (44)a). *Medio* ‘average’ is instead only postnominal (hence endowed with a [*whose-pictures* pied-piping] feature which causes the NP to raise above it - see (44)b):

(44)a. *un vecchio amico*

‘a friend of long-standing’ (**un amico vecchio*)

b. *l’italiano medio*

‘the average Italian’ (**il medio italiano*)

b) single adjectival subclass:

Cypriot Maronite Arabic colour adjectives of Arabic origin necessarily follow the NP while those of Greek origin may either follow or precede. See (45), from Panayidou (2013,179f):

⁴⁶ A domain where in many languages (especially SVO ones – cf. Cinque 2011) single lexical items appear to have to be marked with either [*whose-pictures* pied-piping] or [*pictures-of-whom* pied piping] features is that of the order of proper nouns and common nouns (which correlates with the head-initial/head-final word order types, as noted in Greenberg 1963,89f).

⁴⁷ The *enough* which modifies nouns and prepositions appears instead to have a [*pictures-of-whom* pied-piping] feature as it (preferably) precedes NPs and PPs (cf. Maling 1983,§1.4).

⁴⁸ ‘Direct modification’ adjectives are attributive adjectives which either cannot have a relative clause source because they are non-predicative or if they can also have a predicative usage are not necessarily derived through a reduced relative clause but modify the NP much as adverbsPs modify the VP. Some of their subclasses, in Italian, are necessarily post-nominal (classificatory, provenance, etc.), others can appear both pre- and post-nominally (size, age, value, etc.). Cf. Cinque (2010).

- (45)a. (tin-i) varka χabra (with [*whose-pictures* pied-piping]) (**tin-i χabra varka*)
 (give-me) paper.def.f red.def.f
 ‘(Give me) the red book/paper’
- b. (tin-i) li-prasini varka (with [*pictures-of-whom* pied-piping]) (but also *varka li-prasini*)
 (give-me) the-green.f paper.def.f
 ‘(Give me) the green book/paper’

Istro-Romanian (Zegrean 2012,93) presents a minimal pair of the same general type. The provenance adjective *taljanski* (of Slavic origin) has to precede the noun (thus imposing a [*pictures-of-whom* pied-piping] movement of the NP), while the adjective *taljan* (of Romance origin) has to follow the noun (thus imposing a [*whose-pictures* pied-piping] movement of the NP).⁴⁹

- (46)a. ur taljanski fečor (*ur fečor taljanski)
 b. ur fečor taljan (*ur taljan fečor)
 ‘an Italian boy’

Another case is provided by Italian provenance adjectives, which are only postnominal (see (47)a), in contrast with size adjectives, which can either be pre- or post-nominal. See (47)b):⁵⁰

- (47)a. l’**invasione romana** della Tracia/*la **romana** invasione della Tracia)
 ‘the Roman invasion of Thrace’
- b. l’**enorme** cupola di S.Pietro/la cupola **enorme** di S.Pietro
 ‘the enormous cupola of S.P.’s’

c) single category within an extended projection

Farsi adjectives are all postnominal (except those in the superlative form - cf. Kayne 2008, note 15 and reference cited there). This can be achieved, in the spirit of Webelhuth (1992, §1.6), if all lexical items that contain the [+Adj] categorial feature are marked as imposing a [*whose-pictures* pied piping] movement of the NP (the pre-nominal position of superlative adjectives being instead a

⁴⁹ The fact that their origin may ultimately be responsible for the different pied piping features of the different adjectival classes in Cypriot Maronite Arabic and Istro-Romanian is irrelevant. A child has to determine the feature responsible for the correct order without necessarily knowing from which grammars the adjectives were borrowed.

⁵⁰ Also see the case of classifying adjectives in Polish, the only class of adjectives that can be postnominal, thus apparently triggering overt raising of the NP (Rutkowski and Progovac 2005).

function of the movement of the adjective to a high position within the extended nominal phrase - cf. Cinque 2010,124n13).

d) All categories within a particular extended projection

In the Kwa language Gungbe adjectives, numerals, demonstratives, and other nominal modifiers are all post-nominal (Aboh 2004, Chapter 3). In the present context, this means that all lexical items of any of the nominal modifier classes are marked as imposing a [*whose-pictures* pied piping] feature.

e) All categories within all extended projections

All lexical items (whatever their categorial label) of Japanese would instead be marked as imposing a [*pictures-of-whom* pied piping] feature (thus yielding virtual “cross-category” harmony, with the exception of numerals which can also be post-nominal, possibly with a discourse-related difference with respect to pre-nominal ones – cf. Kim 1995).

So far, we have observed cases in which the [*pictures-of-whom* pied piping] or the [*whose-pictures* pied piping] feature appears to be imposed by the modifier.

As mentioned above, there seem to be reasons to also endow the modified category with the same type of features, as there are cases where it is the modified category that apparently determines the kind of movement involved. This implies that the features of the modifier and those of the modified category must match for the derivation not to crash.⁵¹

4.3 Cases of attraction determined by the modified category.

In Swedish, **adjectives** taking a DP complement fall into three classes (Platzack 2014,§4): 1) those, like *bekant* ‘known to’, *kär* ‘dear’, *värdig* ‘worthy of’, *likgiltig* ‘indifferent to’, etc., which can only follow their DP complement (see (48)); 2) those, like *kvitt* ‘be/get rid of’ *lik* ‘like’ *värd* ‘worth’, etc., which can only precede their DP complement (see (49)) and 3) those, like *trogen* ‘true to’, *underlägsen* ‘inferior to’, *överlägsen* ‘superior to’, etc., which can either precede or follow their DP complement (see (50)):

(48)a. Hon var honom likgiltig.

She was him indifferent

b. Hon var likgiltig *(för) honom.

⁵¹ That both attractor (modifier) and attractee (modified category) may share features is also suggested in Rizzi (2016,§6).

She was indifferent to him
'She was indifferent to him'

- (49)a. Han är kvitt sina plågor.
He is rid-of his.REFL pains
b. *Han är sina plågor kvitt.
He is his.REFL pains rid-of
'He got rid of his pains'

- (50)a. Hunden är sin husse trogen
The dog is his master faithful
b. Hunden är trogen sin husse
The dog is faithful his master
'The dog is faithful to his master'

Assuming, as we have done throughout, that nothing is merged to the right of a lexical category (with the consequence that any complement will be merged in the Spec of a projection above the lexical XP)⁵², in the first case, the adjective must be endowed with a [*pictures-of-whom* pied piping] feature; in the second with a [-pied piping] feature⁵³; and in the third with either a [*pictures-of-whom* pied piping] or a [-pied piping] feature (alternatively, left unspecified).

⁵² Raising further, above any adverbial modifiers of the adjective, as shown in (i), from Platzack (2014,§5):

- (i) Han var [sina motståndare_i mycket t_i överlägsen].
he was his.REFL opponents very superior
'He was quite superior to his opponents'

The same is true of Quechua (Cole 1982,74f) and German (Riemsdijk 1983), whose case marked complements invariably precede the adjective.

⁵³ That the AP plausibly moves in this case without pied piping (the third case of movement mentioned above) can be inferred from the fact that whenever an adjective takes two DP complements (like *skyldig* 'owing'), attraction is possible (in fact necessary) above just the lower one (cf. (i)a.), or above both, in the direct, not the mirror, order (cf.

(i)b.) (Platzack 2014,§2):

- (i)a. Han var sin son skyldig en ursäkt.
He was his.REFL son owing an excuse
b. Han var skyldig sin son en ursäkt.
He was owing his.REFL son an excuse

Modulo phrasal instead of head movement, this is similar to what Platzack (2014) proposes. Also see Platzack (2014,§1) for arguments that the DP complement is not preceded by a silent preposition, and Platzack (1982).

Nouns in certain languages also appear to determine the mode of attraction. In Yugambeh-Bundjalung (Bandjalang) (Pama-Nyungan, Australia) adjectives “follow nouns denoting humans, but precede those denoting trees and neuters.” (Sharpe 2005,98):⁵⁴

(51) **N_{+hum} AP or AP N_{-hum}**

This would seem to suggest that in this case it is a feature of the N that determines the mode of pied piping movement above the adjective (whether it is of the *whose-pictures* or of the *pictures-of-whom* pied piping type, yielding N_{+hum} AP or AP N_{-hum}). As noted above, the AP must have a feature matching that feature.

Similarly, in Tuyuca (Tucanoan, South America) “numerals precede inanimate nouns and follow animate nouns [my translation]” (Barnes 2000,446), suggesting once again that it is the noun that dictates the type of pied piping involved:

(52)a sika-‘ga ‘dii-ga

one-clf ball-clf

‘one ball’

b. ĩbĩ-‘ã iti’a-rã

man-PL three-PL

‘three men’

A comparable situation is found with **adpositions**, which in certain languages also appear to determine, depending on the particular adposition, the mode of movement.⁵⁵ See, for example, the case of Michif (Mixed (French-Cree) language - Bakker 1997,112), where *d* ‘of’ is a preposition (i.e., endowed with a [*whose-pictures* pied piping], or a [-pied piping] feature ((53)a), and *pour* a postposition (i.e., endowed with a [*pictures-of-whom* pied piping] feature ((53)b):

(53)a. **d** sa:b

of sand

⁵⁴ Also see the case of Vanimo (Papuan), which has the order N Num A Dem with human nouns and either the same order or the alternative order N A Num Dem with non-human nouns (Ross 1980,§2.1).

⁵⁵ I am not concerned here with axial part (or relator) “prepositions” (like ‘under’, ‘behind’, ‘next to’, etc.), which can follow the DP even in head-initial languages, possibly in correlation with the position of the genitive (for discussion see Cinque 2010b and references cited there).

- b. bi:bi: **pour**
 baby for
 ‘for the baby’

In other languages the DP complement can, indifferently, precede or follow the same adposition, which we consequently take to be endowed with either a [*whose-pictures*] or a [*pictures-of-whom*] pied piping feature. See, for example, the case of German, (54) (Haider 2014,§2):⁵⁶

- (54)a. **nach** meiner Meinung
 b. meiner Meinung **nach**
 ‘in my opinion’

Also **modals, auxiliaries and complementizers** in the extended projection of the VP appear to be able to determine the type of pied piping involved.

In Vietnamese the deontic modal precedes the lexical verb while the ability modal follows:

- (55)a. Co áy se không **phải** gap em. (Duffield 1999,97)
 PRN DEM FUT NEG **must** meet PRN
 ‘She will not have to meet with you.’
 b. Co áy se không gap em được. (Duffield 1999,97)
 PRN DEM FUT NEG **meet** PRN **can**
 ‘She will not be able to meet with me.’

In Persian Farsi, “the perfect auxiliary *budan* (“to be”) must appear after the main verb. On the other hand, the future tense auxiliary, used in formal contexts, is expressed by adding the auxiliary verb *xastan* (“to want”), inflected for person and number immediately before the verb stem” (Goldberg 2002,§6.1). See (56)a-b:⁵⁷

- (56)a. (man) rafte **budam**
 (I) go.PART be-PAST.PERF.1.sg
 ‘I had gone’

⁵⁶ These are often called ‘ambipositions’, among other terms. See Libert (2006) for discussion and distinctions to be made.

⁵⁷ I thank Alireza Soleimani for corrections in these examples and glosses.

- b. (man) **xâham** raft
 (I) FUT-1.sg go
 ‘I will go.’

As for complementizers, in one and the same language, Bangla, one complementizer (of nominal origin), *je* (which we take it to be endowed with a [*whose-pictures* pied piping] feature), precedes its complement clause (cf. (57)a), and another (of verbal origin), *bole* (which we take to be endowed with a [*pictures-of-whom* pied piping] feature), follows it (cf. (57)b):

- (57)a. Chele-Ta Sune-che [je [or baba aS-be]] (Bayer 1996,255)
 Boy-CL hear-Pst3 COMP his father come-will
 “The boy heard that his father will come”
- b. Chele-Ta [[or baba aS-be] bole] Sune-che (Bayer 1996,255)
 Boy-CL his father come-will COMP hear-Pst3
 “The boy heard that his father will come”

All of this seems to suggest that both modifiers and nouns, adjectives, prepositions, auxiliaries, modals, complementizers (hence, by inheritance, their maximal projections) must be endowed with either a [*pictures-of-whom* pied piping] feature or a [*whose-pictures* pied piping] feature, as it is them in some cases that determine the movement mode. This suggests, as noted, generalizing the endowment of such features to both the modifier and the modified category, whose movement features will have then to match so that movement can take place in the ordinary way.

Differently from such categories, it would seem that single verbs cannot be endowed with a special pied piping feature, for, as Webelhuth (1992,49) observed, they take their complements on the same side so that no verb can differ from any other verb in the direction in which it takes a complement.⁵⁸ This, however, remains to be ascertained at a cross-linguistic level because all other categories, as seen, seem to be able to be endowed lexically with one such pied piping feature.

⁵⁸ In old Swedish one could have OVinf with objects whose D is not filled and VO otherwise (Holmberg and Platzack 2005,449f), but here the difference depends on the object (whose associated FP may consequently be marked with a [*whose-pictures* pied piping] feature or a [*pictures-of-whom* pied piping] feature), not on the verb.

4.4 Reconciling the microparametric approach with the tendencies for intra- and cross-category harmony and with the acquisition problem.

Any microparametric lexical approach to word order parameters will however have to ensure certain types of (intra-category and cross-category) harmony, since otherwise, as noted in Baker (2008,360), languages should distribute in a continuum of every possible combination of word order properties if each lexical item could differ from all others *ad libitum*. But we have seen that there are clear tendencies; in particular that there is a much stronger cross-category harmony when ‘heads’ and their complements are involved (V/O and P/O) than there is when ‘heads’ and their modifiers are (V/AdvP and N/AP), and again a stronger intra-category harmony in the extended projection of a certain lexical head when ‘heads’ (V, Modal, Aux; N PL Art) rather than modifiers (V AdvP₁ AdvP₂; N AP, RelC) are involved.⁵⁹ These partial harmonies can perhaps be captured even in a microparametric approach if lexical specifications can be the result of certain generalizations, ultimately encoded in the lexicon. The special word order behavior of a single lexical item (*enough* in English) is a limiting case. More common are larger generalizations (all adjectives belonging to a certain subclass, say provenance adjectives). This means, for example, that in the lexicon of Italian all such adjectives will be endowed with the [*whose-pictures* pied piping] feature. Larger generalizations (like the Persian Farsi case) would be governed by the same logic: in this case, the lexical category adjective (hence all of its members) would be endowed with a [*whose-pictures* pied piping] feature, and the same mechanism would apply to larger generalizations, like the case of all nominal modifiers in Gungbe (which would be lexically endowed with a [*whose-pictures* pied piping] feature).⁶⁰

The conjecture that word order may be governed by lexical specifications of a successively larger type (from a single lexical item to subclasses of a lexical category, to an entire lexical category, to two or more, or all, lexical categories) relates immediately to the problem of acquisition. It is possible that this is guided by a default assumption that once the lexical category is attracted in one of the two modes (*whose-pictures* or *pictures-of-whom* pied piping) the default expectation is that it (or any other category of the same verbal or nominal type) will continue to move in the same mode, **up to disconfirmation**. This may even lead (in few cases, as seen) to almost perfect cross-category harmony if the default expectation of a uniform attribution of the pied piping feature is not

⁵⁹ Cf. Dryer (1992,fn17).

⁶⁰ This comes close to the intermediate position (between micro- and macro-parametric approaches) that Baker (2008) discusses in his footnote 2. Still, it can be cast, it seems to me, as a lexical rather than as a general grammatical property.

contradicted by the primary linguistic data.⁶¹ Ultimately, the language internal generalizations will be fixed, down to the most minute details (say, titles, which in English move via the *whose-pictures* pied piping mode (*Lady Windermere, Sir John, professor Chomsky, Mount Auburn*, etc.) while common nouns move either via the *pictures-of-whom* pied piping mode (*Auburn mountain, Ormond road*) or the *whose-pictures* pied piping mode (*letter 'k', Cape Canaveral*, etc.), or both (*(the) Mississippi river/river Mississippi*)).

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⁶¹ For similar ideas, within a somewhat different system, see Biberauer, Holmberg and Roberts (2008, 2014).

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