No-Choice Parameters and the Limits of Syntactic Variation

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1. Introduction

It is a general fact about natural languages that they exhibit what we will call 'structured variation': on the one hand, some hypothetical possibilities are unattested (gaps) and, on the other, the same patterns recur in large numbers of unrelated languages (commonalities). In fact, some features occur so frequently that they cannot be due to chance, whether or not they are universal: leftwards movement, Subject>Object order, and verb-based answers to yes-no questions are all cases in point. A key task for linguistic theory is therefore to explain the existence of this structured variation. What remains unclear, though, is the extent to which the explanation for these gaps and commonalities should be purely formal in nature, or in other words, to what extent their explanation should stem from Universal Grammar (UG).

Formal and functional explanations of linguistic phenomena are often portrayed as opposite poles of explanation. From an extreme formalist perspective, all explanations stem from UG, with structured variation effectively being built into the innate language faculty. From an extreme functionalist perspective, on the other hand, no explanations stem from UG as such a thing does not exist and the hallmark properties of structured variation instead stem from the functional pressures on human languages. The juxtaposition of formal and functional explanations is misleading, however, as it is perfectly conceivable that the commonalities and asymmetries across human languages might be shaped by both formal constraints and functional pressures (cf. i.a. Newmeyer 2005, Anderson 2008, Haspelmath 2008, Nichols 2008, Kiparsky 2008 for broad agreement that this is so).

This position crucially raises the question of *how* formal and functional considerations might interact and also of their relative importance in relation to one another. Previous proposals regarding the *how* question have varied in relation to the point at which functional pressures come into play: do they shape grammars gradually over time, as proposed by Bybee (1998), or are grammars shaped on-line during processing, as argued by Hawkins (1994, 2004)? They have also varied on the way in which formal and functional considerations interact: are the latter organism-external, as standardly assumed or is it feasible to think in terms of certain functional pressures as having been "biologised" in one way or another (cf. Kiparsky 2008)? In this connection, Kiparsky (2008:25-6) observes that "we could speculate that evolutionary pressures might have caused the innate learning mechanism to favor grammars that optimize perception, production, and/or stable transmission in certain ways. A language designed in modular fashion, with different levels of representation subject to their own constraints, may well be the most efficient for this combination of tasks". Chomsky's (2005) "three factors"

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minimalist approach tackles the language-design and acquisition issues highlighted by Kiparsky in a different way, one which, we argue, may facilitate potentially very fruitful new opportunities for understanding the relationship between formal and functional pressures in determining the shape of language (cf. also Mobbs 2008, in progress). In this approach, the components in (1) all play a role:

(1) a. a pared-down UG, devoid of the kinds of rich structure posited in the GB era (Factor 1),
b. the linguistic input/PLD (Factor 2), and
c. non-language-specific, but putatively *human*-specific principles (Factor 3).

More specifically, Chomsky (2005:6) specifies as third factors:

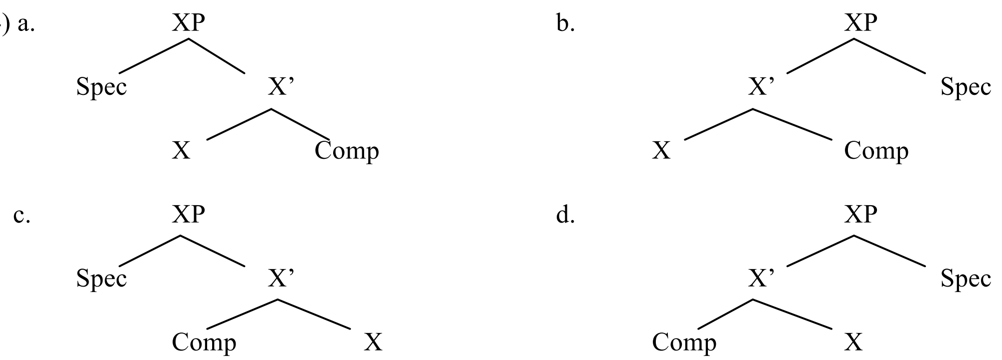
(2) a. "principles of data analysis that might be used in language acquisition and other domains", and
b. "principles of structural architecture and developmental constraints ... including principles of efficient computation".

In "three-factor" terms, then, it would not *a priori* be necessary to biologise learning mechanisms favouring very commonly attested structures, as Kiparsky suggests; and, inasmuch as these properties are found in other areas of human cognition, vision, hearing, etc. it might also not be necessary to biologise all aspects of language design (modular architecture, constraints, etc.). In fact, from a "three factors" perspective, the long-standing generative notion that *acquisition*[1] shapes individual grammars (I-languages), and thus also the observed crosslinguistic patterns, creates new possibilities for understanding how formal and functional pressures may interact. Our goal here will be to show how, within an emergentist framework like that of Chomsky (2005), functional pressures of different kinds can influence parameter-setting, creating "offers that cannot be refused" and thereby leading to structured variation. We will focus on three case studies, discussed successively in Sections 2-4, with Section 5 briefly concluding.

2. Case Study 1: Word Order

In the context of the "rich UG" model of classic Principles and Parameters theory (Chomsky 1981), the phrase-structure module was thought to include the universal syntactic template provided by X-bar theory. This template (one of UG's presumed *principles*) potentially admitted at least two independent parameters, namely those in (3), giving the structural options in (4):[2]

(3) a. Spec Parameter: Spec PRECEDES/FOLLOWS X-bar
b. Head Parameter: X PRECEDES/FOLLOWS Comp

(4)


[1] "the growth of language in the individual" (Chomsky 2005:6)
[2] We leave aside here the question of a potential Adjunct Direction Parameter.

Importantly, the c-command relations holding across languages are assumed to be identical, regardless of the directionality choices made in relation to (3), with linear order systematically reflecting constituency. This is a *symmetric* view on word-order variation.

Kayne (1994) raises various by now well-known challenges to this symmetrical view, arguing that word-order asymmetries of various kinds undermine it and, moreover, undermine it in a very consistent way. These include the plentiful attestation of leftward, but not rightward *wh*-movement; the fact that Greenberg's Universal 25 can be accurately rephrased as a restriction on leftward rather than rightward movement (in this case, of nominals of different types); left- rather than right-oriented agreement patterns (e.g. the contrast between SVO and VSO orders in languages permitting both, the difference between pre- and postpositional complementation, etc.); and various respects in which VO and OV languages can be shown not to be mirror images of one another (cf. Kayne in press for discussion of a wider range of evidence). Kayne (1994 *et seq.*) interprets these empirical skewings as evidence that phrase structure is in fact *asymmetric*, and that this asymmetry follows from the specific structural fact that asymmetric c-command maps to linear precedence. Asymmetric c-command is arguably unproblematic as a central notion in this proposal as c-command is simply the transitive closure of sisterhood and containment, two relations made available by Merge; additionally, asymmetric c-command seems to be independently required as the evidence suggests that it is deployed at the semantic interface (e.g. for scope and binding; see work since Reinhart 1983 and May 1985). That this credibly Merge-give relation should specifically map onto *precedence* is simply stipulated, however (though see Kayne 1994, in press for different attempts to motivate this mapping).

Taking as our point of departure a minimal UG which is, contra its GB incarnation, *not* richly specified with parametric content, we propose that the striking syntactic asymmetry just discussed can indeed be understood as the consequence of asymmetric c-command mapping onto precedence, as Kayne proposes, but that this is the consequence of a parameter rather than a principle. More specifically, our proposal is that the precedence component of Kayne's Linear Correspondence Axiom (LCA) is a no-choice parameter which is, for spoken languages at least,[3] uniformly set to *precedence* because of functional, and, in particular, processing, pressures. On this view, the underspecified option underlying the relevant parameter can be characterised as in (5):

(5) Asymmetric c-command maps onto PRECEDENCE/SUBSEQUENCE.

To the extent that asymmetric c-command is simply a property of the structures created by Merge which PF can then latch onto in order to solve the linearization problem, the underspecified option in (5) can be viewed as an emergent parameter, i.e. as one which arises as a result of the way in which UG-given components (here: featurally-driven Merge) interact with the PLD and, in particular, with what are arguably third-factor efficient acquisition (i.e. (2a)) and also "good design" (i.e. (2b)) considerations, namely making maximal use of minimal means (cf. also Biberauer 2011). What fixes the parameter and ensures that this fixing always results in a PRECEDENCE setting, thereby giving the impression that we are dealing with a *principle*, however, is a functional consideration: filler-gap dependencies are easier to parse if the filler precedes the gap (cf. i.a. Crain & Fodor 1985, Hawkins 2001, Ackema & Neeleman 2002, Abels & Neeleman 2009, 2012, Wagers & Phillips 2009). If movement is always upward as standardly assumed, leftward specifiers and heads located to the left of the XPs they select (such that higher heads are to the left of lower ones) will produce the desired filler-gap structures. This is what the PRECEDENCE setting guarantees. In terms of our account, then, what underlies the precedence component of Kayne's analysis of the striking skewing in attested word-order patterns is the interaction of a formal consideration (c-command/order mapping, as expressed in (5)) and a functional consideration (the need for fillers to precede gaps).

[3] It has been proposed that signed languages might differ from spoken languages in featuring rightward *wh*-movement – consider, for example, Cecchetto, Geraci & Zucchi (2009). Abner (2011) argues against this interpretation of the facts, pointing to information-structural considerations which may indicate that apparently rightward *wh*-movement is in fact also leftward. We leave this matter open here, pending better understanding of the processing considerations in play in signed languages.

Crucially, this proposal is in a very important respect distinct from the at first sight very similar one by Abels & Neeleman (2009, 2012). Their argument is that observed word-order asymmetries reduce to a ban on rightwards movement, which is motivated by parsing pressures. In particular, they focus on Greenberg's Universal (20), given in (6):

(6) Universal 20: When any or all of the items *demonstrative, numeral* and *adjective* precede the noun, they are always found in that order. If they follow, the order is either the same or its exact opposite.

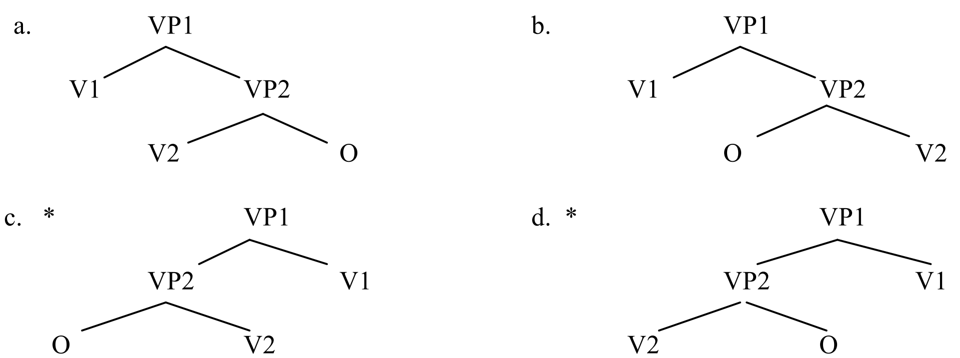
This leads to the prediction that the attested orders should be (7a-c), where (7a) and (7b) are mirror images of one another, but the mirror image of (7c) is ruled out (see (7d); we leave aside here the respects in which this prediction is not entirely accurate; see Abels & Neeleman 2009, 2012):

(7) a. Dem Num A N
  b. N A Num Dem
  c. N Dem Num A
  d. *A Num Dem N

As noted by Cinque (2005), it is possible to explain the asymmetry in (7) by appealing to Kaynian antisymmetry and, in addition, to the contraint that only a constituent containing the head noun N can move. Abels & Neeleman (*op.cit.*), however, argue that the parsing-imposed ban on rightwards movement combined with the constraint on moving constituents lacking N offers a more natural account of the facts: among other things, it does not require an appeal to the machinery of antisymmetry and all it entails (massive roll-up, remnant movement, uncertain movement triggers, etc.). For Abels & Neeleman, then, both left- and right-branching structures can be base-generated (=(7a,c)); while the mirror-image order of the head-initial order can be generated by leftward N-movement (=(7b)), the mirror-image order in (7d) can, however, not be generated, owing to the parser-imposed ban on rightward N-movement. The asymmetry between the left- and right-branching base-generated orders is schematised in (8):

(8) a. [N [Dem [Num [A (N)]]]] – leftward N-movement from a head-initial base ((7a, b))
  b. *[[[[(N) A] Num] Dem] N] – no rightward N-movement from a head-final base ((7c,d))

Abels & Neeleman, then, predict, as we do, that moved heads and specifiers targeted by movement will always occur on the left, with parsing considerations (filler>gap) being decisive. Our proposal differs from theirs, however, in the implication that this asymmetry will also apply to the ordering of heads. There appear to be at least two sources of evidence suggesting an asymmetry in the relative ordering of heads: serial-verb constructions and (partly related) Final-over-Final Constraint (FOFC) effects. The former have the peculiar property, recently highlighted by Carstens (2002), that the relative ordering of the argument(s) in relation to the serial verbs (V1 and V2) may vary, while the relative ordering of V1 and V2 never does, even in otherwise consistently head-final languages: the structurally higher verb always *precedes* the structurally lower one; cf. (9):

(9)


From the current perspective, this can be understood as a constraint on the headedness of the higher verb, which, for reasons that are not fully understood, must always reflect the order that is formally unmarked in a system where not just heads targeted by movement, but also First-Merged heads are initial.Viewed from Abels & Neeleman's perspective, there is no explanation for the ban on base-generated head-final orders that evidently holds in relation to V1 as this order is, for them, not in any sense marked; further, the parsing-imposed ban on rightward movement (and possibly the Head Movement Constraint) also rules out the possibility of rescuing base-generated (9c,d)-type structures via movement to a position higher than V1(an option that would, of course, also introduce the need for an explanation as to why V2 can never raise above V1 in (9a,b)-type structures). Equally, the difficulty for Abels & Neeleman's approach could be seen to be the fact that head-initiality in their system is in no sense "special", which it, however, appears to be in the serial-verb context.

Even more serious for Abels & Neeleman's proposal, and partially related to the Serial-Verb pattern, are the putative empirical reflexes of the Final-over-Final Constraint, stated in (10):

(10) **The Final-over-Final Constraint (FOFC):** A head-final phrase cannot (immediately) dominate a head-initial phrase in the same extended projection.

FOFC underlies the virtual diachronic and synchronic absence of phenomena like those in (11):

(11)	a.	*[V O] Aux	(Biberauer et al. 2008 *et seq.*)
	b.	*[V O] ...C	(Hawkins 1994, Kayne 1994)
	c.	*[C TP] V	(Dryer 2009, Biberauer & Sheehan 2012)
	d.	*[Q TP] C	(Biberauer, Sheehan & Newton 2010)
	e.	*[Asp V] T	(Julien 2002, 2007)

Crucially, nothing stops the FOFC-violating order – also diagrammed in (9d) above – from being base-generated without some version of antisymmetry. We therefore argue that FOFC provides crucial evidence that the ordering of heads is subject to the same kind of asymmetry as that observed with specifiers (cf. Biberauer, Holmberg, Roberts & Sheehan to appear for more detailed discussion). Significantly, the facts cannot be understood only in terms of a parsing-imposed ban on rightward movement nor, as Sheehan (in press b) shows, by appealing exclusively to functional explanations of other kinds (see Biberauer, Holmberg & Roberts 2013, Sheehan in press a for differing analyses based on antisymmetry).

What we have seen, then, is that there appears to be evidence that word-order asymmetries (commonalities and gaps) affect both base- and movement-generated specifiers and heads, and that a unified explanation requires both a formal and a functional component: while some word-order asymmetries could plausibly be thought of as being enforced directly by parsing pressures (e.g. the ban on rightward operator-movement), others are more credibly side-effects of the third-factor-driven way in which Merge-given hierarchical relations are mapped into a temporal ordering at PF; with the latter in place, however, a unified explanation of linearization phenomena presents itself, precluding the need for both parsing-only and parsing-plus-mapping explanations. The existence of structures reflecting the linearization imposed by a PRECEDENCE-fixed (5), but violating its parsing component, viewed in isolation, further supports this unification. Consider in this connection gap>filler remnant topicalisation structures like that in (12):

(12) a. Gelesen hat er das Buch (German)
read.PART has.FIN he the book
"As for reading (cf. den Besten & Webelhuth 1990)

b. [$_{CP}$ [$_{VP}$ **(das Buch)** gelesen] hat-C [$_{TP}$ er .... **das Buch** ([$_{VP}$ (das Buch) gelesen]]]

Structures of this type are expected to be possible, albeit perhaps not very numerous, if linearization is governed by the "blind" application of a fixed structure-to-order mapping convention of the type we have proposed here; if it is determined exclusively by the on-line or historical effects of parsing pressures, by contrast, this expectation disappears.[4] We see, then, that various aspects of the actually observed variation in the domain of word order (the skewing towards head-initiality in First-Merged structures, the existence of structures violating the filler>gap parsing preference) remain mysterious if we appeal only to functional considerations, but emerge as expected if these considerations serve to fix a formally encoded and formally defined mapping algorithm like (5).[5]

Our conclusion in relation to the ordering asymmetries discussed in this section is therefore that rethinking a version of Kayne's LCA as a no-choice parameter serves to explain structured variation in word orders without either the need to posit a richly specified UG or the need to discount the role uncontroversially played by parsing, a desirable outcome.

3. Case Study 2: Parameter Hierarchies

Our second case study shows how the space of variation may be further structured by the interactions between (emergent) parameters. Following Roberts & Holmberg (2010), Roberts (2012), we assume that some parameters are dependent in the sense that their activation depends on the setting of another parameter. For example, the parameters governing the availability of Exceptional Case Marking are only relevant in a language which has infinitivals. Such dependencies can be fruitfully modelled via parameter hierarchies, whereby certain parameters can be shown to be in feeding/bleeding relationships. As Roberts (2012) notes, such parameter hierarchies vastly diminish the variation space, reducing the number of linguistic systems defined by n parameters from 2^n to n+1. As such, 10 independent parameters yield 1024 linguistic systems, whereas 10 dependent parameters arranged in a parameter hierarchy yield only 11 linguistic systems. Consider the following hierarchy from Sheehan (this volume), which models clausal alignment (see Sheehan, this volume, for details):

(13) **Basic alignment parameter**: Does transitive v assign theta-related ERG to its specifier?

N Y

Accusative (*Russian…*)

Split-S parameter: Do all vs assign ERG?

Y N

Morphologically Split-S *(Chol, Basque, Hindi*)

Syntactic ergativity parameter: Does v_{ERG} bear an EPP-feature?

N Y

Tripartite parameter: Does v_{ERG} assign morphologically overt Case?

Y N

Tripartite *(Nez Perce)*

Morphologically ergative (*Warlpiri)*

High/Low ABS parameter: Does v_{ERG} lack structural Case features?

N Y

Low ABS (*West Greenlandic, Tagalog*)

High ABS (*Dyirbal, Q'anjob'al)*

The first two parameters are self-explanatory and concern whether any or all vs have the property of assigning ERG to their specifiers. The Syntactic Ergativity parameter, taken from Aldridge (2004 *et seq.*) concerns the presence/absence of an EPP-feature on ERG-assigning vs (v_{ERG}). In languages where v_{ERG} bears such a feature, the internal argument is attracted to Spec-vP, trapping the subject inside vP.

[4] If one were to pursue a purely functionalist explanation of the facts under discussion here, one could, of course, seek to identify motivations that may successfully compete with the filler>gap preference in cases like (12). What kind of motivation this could be and why it is only rarely successful is not evident, however.

[5] Rather differently from what is usually assumed about the categorical nature of formal proposals, adding the formal dimension to the parsing one is actually what gives us the basis for understanding why a functional pressure does not always hold, i.e. why there are structures like that in (12) which reduce this pressure to that of a *preference*.

As Sheehan shows, (13) successfully models attested alignments as well as positive and negative implicational universals relating to syntactic ergativity.

In the context of a minimalist conception of language, a question that arises about parameter hierarchies like (13) is where the dependencies between parameters come from (there is, of course, also a question about the formulation of the parametric options themselves, and how these are determined, a very large question which we leave aside here; see Biberauer (2011) for some discussion).What makes the High/Low ABS parameter dependent on the Syntactic Ergativity parameter, for example? Given a minimalist conception of language, it seems very unlikely that such information would be encoded in Universal Grammar directly. An alternative is to look for third-factor explanations regarding the relevant dependencies and, in cases such as the one under discussion here, where it is clearly crucial that the properties are established in the order given (so as to account for the actually attested patterns of variation), why they would need to relate in the way they do. Take, for example, the negative feeding of the Split-S parameter and the Syntactic Ergativity parameter. Although it appears to be empirically supported that Split-S languages[6] cannot be syntactically ergative, the question remains why this should be the case. Sheehan (this volume) argues that this effect is forced by the need for grammars to be specified in such a way that they can produce converging structures. Consider a language which has generalised the ergative-assigning property to all vs. Now assume that such a system is allowed to associate an EPP-feature with $v_{ERG.}$ The result would be a system in which unergative v as well as transitive v bears an EPP-feature. In transitive clauses, the internal argument will raise to Spec-vP, trapping the DP_{ERG} inside the vP phase, as discussed above. In an unergative clause, however, there will be no XP to satisfy the EPP-feature and so the derivation will simply be unable to converge. If the Syntactic Ergativity parameter is negatively fed by the Split-S parameter, as indicated in (13), this kind of non-convergent system is ruled out. In fact, on the assumption that parametric hierarchies model acquisition paths (Roberts 2012, Biberauer 2011), this negative feeding entails that acquirers will not need to consider the Syntactic Ergativity question if they have established a positive setting for the Split-S parameter (see (13) above), a scenario which can be interpreted as involving another kind of no-choice effect with consequences for typology.

As things stand, many questions remain open, including, notably, that of how the PLD, in combination with what is UG-given and what is imposed by non-language-specific constraints, can lead children to analyse the input in the sequential way parametric hierarchies suggest they must in order to converge on the systems they are acquiring. If the case study considered in this section is on the right track, interface-imposed convergence requirements represent one constraint on the space of variation, i.e. they represent another source of structured variation.

4. Case Study 3: Negation

Our final case study concerns the typology of negation system. The systems that are typically distinguished in the generative literature on negation are those in (14) (cf. Biberauer & Zeijstra 2012a):

(14) a. **Double Negation** languages (e.g. English), in which both the sentential negator and negative indefinites contribute a semantically interpretable negation (here: [iNEG] where *i* signifies "interpretable")
b. **Strict Negative Concord** languages (e.g. Czech), where both the sentential negator and negative indefinites are semantically [uNEG] and the interpretable negation is supplied by an [iNEG] abstract operator (cf. Ladusaw 1992; *[Op iNEG]* below)
c. **Non-Strict Negative Concord** languages (e.g. Italian), where the sentential negator is [iNEG], but negative indefinites are [uNEG].

This typology entails a gap, namely a system in which the sentential negator is [uNEG] and negative indefinites are [iNEG]. Biberauer & Zeijlstra (2012a) show that this gap is apparently filled by strongly prescriptively regulated standard Afrikaans:

[6] These are languages in which intransitive subjects are not uniformly marked, patterning either with transitive subjects or with transitive objects.

(15) a. Dit is **nie**$_{[uNEG]}$ moontlik **nie**$_{[uNEG]}$
it is not possible not
'It is not possible'
b. **Niemand**$_{[iNEG]}$ het **niks**$_{[iNEG]}$ nie$_{[uNEG]}$
no-one has nothing not
'No-one has nothing', i.e. Everyone has something; thus Double Negation

What Afrikaans speakers do colloquially, however, is (16):

(16) a. **Niemand**$_{[uNEG]}$ het **niks**$_{[uNEG]}$ nie$_{[uNEG]}$
no-one has nothing not
'No-one has anything', i.e. Strict Negative Concord where all negative elements = [uNEG]

Biberauer & Zeijlstra (2012b) ask why it should be that only a standard language should have the [uNEG] sentential negator and [iNEG] negative indefinite profile, concluding that Factor 2 considerations are central here. More specifically, they argue that the input required to trigger an [iNEG] analysis of negative indefinites – structures associated with Double Negation readings, where two (or more) negative indefinites can be shown to contribute the corresponding number of negatives, as in (15b) – is not available to acquirers. On the one hand, this is because such structures are rarely used (cf. Horn 1989); on the other, because Double Negation structures, with the same characteristic intonation (Liberman & Sag 1974), are also possible in languages where negative indefinites are [uNEG]: (17a) schematises the features producing Double Negation in (15a)-type languages, while (17b) illustrates for a (15b)-type language (since the (15c)-type involves [iNEG] sentential negation markers, while Afrikaans and, more generally, the language-type we are concerned with here has [uNEG] sentential negation markers,[7] we leave these aside; *Foc* represents the formal correlate of the focus intonation associated with one of the negation elements in Double Negation structures):

(17) a. [$_{Foc}$ [iNEG]] + [iNEG] = 2x[NEG]
b. {[Op iNEG]} [$_{Foc}${[Op iNEG]}[uNEG]] [uNEG] = 2x[NEG]

In light of (17), two factors conspire to rule out the negation type instantiated by Standard Afrikaans: (a) a third-factor Input Generalization mechanism (here specifically: "Assume all negative elements to be [uNEG] as you have clear evidence that some negative-marked elements are [uNEG]"); and (b) Factor 2, i.e. the absence of unambiguous PLD supporting the Input Generalization-violating, but theoretically available possibility that some element may be [iNEG]. In the context of an emergent parameters system, where UG does not provide a pre-determined "menu" of parametric options, it is particularly important to provide independent motivation for the plausibility of the parameters acquirers will postulate and also for the sequence in which they will do so.[8] In the present context, it is plausible to assume that children will initially establish the formal specification associated with the Afrikaans negation system on the basis of its sentential negation markers as (a) there is a well-established literature registering the centrality of (basic) sentential negation in the acquisition of negation (see Gilkerson, Hyams & Curtiss 2004 for recent discussion), and (b) neutral sentential negation (i.e. that involving clause-medial *nie*) is in Afrikaans, strikingly, realised by means of a bipartite structure featuring two phonologically identical elements (cf. (15a) above). The obligatory doubling exhibited by Afrikaans' sentential negation markers thus provides the salient initial evidence that negative-marked elements may be [uNEG], providing the basis for Input Generalization.

[7] The assumption is that [iF]s will contribute to semantic interpretation, while [uF]s do not. In the case of Afrikaans, it is clear that unmarked sentential negation involves two identical sentential negation markers, i.e. two negatively marked elements which do not combine to give a positive reading and which must therefore be [uNEG].
[8] On a UG-rich approach, there is, of course, also a(n unanswered) question regarding the original source of the innate parametric specification and, importantly, also of how acquirers are able to "link up" what is innately specified with the input they receive (cf. i.a. Pinker 1984 on the so-called *Linking Problem*).

What we see, then, is that the interaction of Factors 2 and 3 delivers another no-choice parameter: once Afrikaans acquirers have established that their language's sentential negation markers are [uNEG], the featural specification of the negative indefinites in this system must also be [uNEG]; the [iNEG] choice is unavailable as the acquirer will never receive positive evidence for it, with the result that there will never be a reason to depart from the Input Generalization-derived [uNEG] specification. Importantly, the PLD (Factor 2) consideration is not on its own sufficient to guarantee convergence on the [uNEG] specification as it is ambiguous regarding the featural specification of negative indefinites: both (17a) and (17b) are potential analyses of these elements, and so Input Generalization is decisive.

5. Conclusion

Our goal here was to show how an emergentist framework like that of Chomsky (2005) opens up the possibility of understanding the interaction between formal and functional pressures in a new way. In particular, we have suggested that functional pressures of different kinds can exert an influence on parameter-setting, creating "offers that cannot be refused" and thereby leading to structured variation. We have specifically highlighted processing considerations, which can be viewed as a type of developmental constraint (cf. (2b)) in that gap>filler structures remain harder for humans to process throughout their lifetime than filler> gap structures; interface-imposed convergence considerations; and the way in which the PLD interacts with principles of data analysis (cf. (2a)). In the context of this type of approach, it becomes possible to see how properties that might previously have been thought of as hard-wired UG principles and parameters could actually reduce to emergent no-choice parameters. More generally, in line with Chomsky (2005), we see how functional pressures can be seen to influence the growth of I-language in the individual through parameter-setting rather than the initial state of UG itself.

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