Going beyond the input: Three Factors and syntactic variation, stability and change

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This paper introduces a new generative model of language acquisition that accommodates the fact that the input acquirers receive does not reflect a single, invariant 'parent grammar', while still allowing us to understand why transmission across speaker generations looks mostly successful. Like existing models, that advocated here also aims to deepen our insight into the circumstances under which change might expected to occur.

The "traditional" generative model of language acquisition can be represented as in (1):

(1) Universal Grammar (UG) + Primary Linguistic Data (PLD) ➔ I-language grammar

By (1), UG is assumed to be richly specified, but the nature of that specification has been much debated (cf. i.a. Newmeyer 2004, 2005, and the contributions in Picallo 2015). Since Chomsky (2005), however, it has been suggested that a "3rd factor" should be added to the 'traditional" two, with UG becoming a maximally minimal entity. The present model takes this proposal seriously, focusing on how a very minimal UG – one supplying just a formal feature template (e.g. [uF]/[iF]), and the operations Merge and Agree – interacts with specific aspects of the input (PLD) and the general cognitive (3rd factor) bias to Maximise Minimal Means (MMM) to produce I-language grammars, i.e. a "three-factor" model as in (2):

(2) UG (F1) + PLD (F2) + Maximise Minimal Means (MMM) (F3) ➔ I-language grammar

For (2), the non-UG components take on much greater significance than in (1). Accordingly, the first part of the paper will be devoted to clarifying (i) which aspects of the PLD serve as the basis for acquirers' postulation of the specific formal features ([F]s) that define their grammars, and (ii) how MMM shapes feature- and hence parameter-postulation.

Ad (i), I will build on the inescapable fact that acquirers must learn arbitrary form-meaning pairings to acquire the lexicon of their first language, and propose that **systematic departures from Saussurean arbitrariness** serve as a signal of the need to postulate more than just the phonological and semantic features Chomsky (1995) describes as "virtually conceptually necessary", i.e. these signal the presence of formal features, [F]s. I identify 5 types of [F]-signalling departure from Saussurean arbitrariness:

(i) **doubling** phenomena, e.g. concord and agreement (Zeijlstra 2008);
(ii) **systematic silence**, e.g. null arguments, null complementisers, ellipsis;
(iii) **multifunctionality**, where seemingly "the same" morphophonological form serves a number of distinct functions in the system. (cf. Duffield 2014a,b on the system-defining "homophony" found in East Asian languages; cf. also Wiltschko 2014);
(iv) **"basic" word order** and **movement phenomena**. These are viewed as instantiating a higher level of duality of patterning (cf. also Fortuny 2010). Whether V must be to the left/right of O, or whether the "basic" neutral declarative is SOV or VSO is not inherently meaningful, just as individual phonemes are not; "basic" ordering is simply a convention requiring fixing, just as phonotactic constraints require fixing, whereafter it can serve as the basis for further, potentially meaningful ordering patterns, which contrast with the "basic" one (e.g. V2, subject-auxiliary inversion, topicalization/focalization fronting, etc.); and
(v) **recursion** (Roeper 2011).

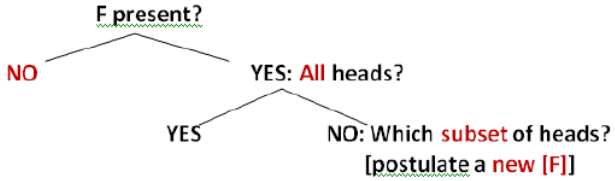
Even with a conceptually motivated proposal as to which aspects of the input matter for grammar acquisition – something that has, until now, been largely absent from generative models – the challenge that remains in the context of the type of emergentist approach I am advocating is how a non-UG-given [F]-system gets off the ground: which [F]s are postulated first and then either generalized or further articulated (see below)? The answer, I propose and motivate on the basis of specific examples, is that certain high-frequency and also strikingly syntax-rich structures – notably, questions and imperatives – are key here.

No less important are the linguistic reflexes of MMM that regulate the acquirer's [F]-postulation, i.e. (ii) above. Two seem particularly crucial:

(3) **Feature Economy** (FE): Postulate as few [F]s as possible.
(4) **Input Generalization** (IG): Generalise postulated [F]s to as many environments as are compatible with the systematic regularities in the input.

Together, these produce **NONE>ALL>SOME learning paths** of the kind illustrated in (5):

(5)



Here postulating NO features satisfies both FE and IG; if an [F] is detected, positing it in ALL relevant domains satisfies IG but not FE; if [F] is absent in expected parts of the PLD, given the previous step (i.e. the domain specified on the basis of [F] is too large), restricting its domain to SOME subset of the previously specified domain by introducing a new [F] minimally violates FE and IG. Strikingly, exactly this kind of hierarchical successive division approach has been independently proposed for phonology (Dresher 2009, 2014) and concept formation (Jaspers 2013, Seuren & Jaspers 2014). That children in particular genuinely approach acquisition tasks in the kind of MMM-regulated way proposed here is, however, most strikingly – and, in the present context, most relevantly – demonstrated by results such as that which have emerged from studies such as Hudson Kam & Newport (2005). Their experimental work revealed that children exposed to unpredictable variation in the input impose systematicity on it, and, moreover, that their regularization takes one of three forms:

(6) a. minimization: use the variable form none of the time
b. maximization: use the variable form all the time
c. linguistically governed selection: use the variable form in a grammatically defined subset of contexts (e.g. only with transitive Vs)

When children go "beyond the input", then, we see the NONE>ALL>SOME options predicted by MMM-driven acquisition. And this is not only the case in experimental settings; exactly these options have also emerged in a number of "real language" contexts, including West Ulster English quantifier-float structures (Henry 2015) and Afrikaans embedded V2 (Biberauer 2015). As Henry shows, different "floating" grammars exist, permitting no float, stranding in all possible positions, or some natural-class subset of these options:

(7) a. What all did he say that he bought? **NONE**
b. What (all) did he (all) say (all) that he (all) bought (all) **ALL** (vP- & CP-edge plus base position)
c. What (all) did he say (all) that he bought? **SOME** (CP-edge only)
d. What (all) did he say (all) that he bought (all)? **SOME** (CP-edge plus base position)
e. What (all) did he (all) say that he (all) bought? **SOME** (vP-edge only)
f. What (all) did he (all) say that he (all) bought (all)? **SOME** (vP-edge plus base position)

The fact that quite distinct situations in which the input is compromised in some way – irregularity, incompleteness (as in (7)-type option-entailing colloquial structures that fall "beyond" the prescriptive radar), etc. – deliver NONE, ALL and/or SOME-type generalisations suggests that the acquisition biases we have identified here are of the kind that can productively be investigated as potential factors in understanding why acquirers are not stymied by partial or irregular input or, indeed, by variation between native-speakers.

Combined with our assumptions about aspects of the input that are particularly significant to acquirers, (3) and (4) applied to a UG-given [F]-template can also aid our understanding of why some seemingly "complex"/"redundant" properties should prove stable (Nichols 1992). Inflectional morphology, for example, always triggers the postulation of one/more [F]s, and IG means that ALL-type systems, in which the relevant [F]s are invariantly associated with a given category – as in noun-/verb-class marking, agglutinating morphology, etc. – will be acquisitionally favoured, and thus expected to be stable, which is correct. The approach also makes clear predictions in cases where acquirers are exposed to minimally different "parent" grammars: where the grammars are "equal" (as the SOME-options in (7) may be), different acquirers will acquire slightly different grammars, thus preserving the initial variation, though possibly in different overall proportions; where one grammar is "simpler" (e.g. the ALL-option relative to the SOME-options), we expect to see the effects of IG, i.e. convergence on the largest-domain pattern, an option which may also obtain for input featuring a combination of NONE- and ALL-grammars (those, as in (7), where the NONE-grammar is a subset of the ALL-grammar; this is phenomenon-specific as NONE-grammars can also be non-overlapping, e.g. in the word-order domain) and "unequal" SOME-grammars (e.g. those in a super-/subset relation, or where prescriptive influence introduces a SOME-grammar for which there is no unambiguous PLD, as in Afrikaans negation; Biberauer & Zeiljstra 2012a,b).