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# Grammatical representations versus productive patterns in change theories

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**Abstract:** In this paper, I discuss differences between representational change (i. e. in formal features and structures involved in grammatical competence) and change in quantitative patterns (i. e. in the quantitative properties of the language system in use), as relevant to my approach to incrementation. My approach differs from the standard variationist sociolinguistic approach because I argue that representational<sup>1</sup> input-divergence<sup>2</sup> along the child learning path contributes to quantitative differences between children and older speakers, most importantly the input speakers. In this way, the Inverted U Model (IUM) for incrementation offers an initial sketch of a linking theory between (a) child developmental findings for competence-related changes over acquisitional time in the individual, and (b) the change-in-progress phenomenon of incrementation which describes how usage rates for innovative variants advance relative to conservative variants in speakers in the community over generational time. Maximize Minimal Means (MMM), this volume similarly attributes a principled, creative role in change to the child-learner, offering a linking theory between (a), and (c), discrete changes in representations between grammars in historical time, grounded in Minimalism.

I'll also respond to Westergaard's (this volume) argument that the IUM's reliance on child overgeneralization conflicts with a set of linguistic phenomena for which directional, child-driven changes have been proposed, namely syntactic changes characterized by economy or simplification. In syntax, relative to common language change pathways (e. g. *biclausal* > *monoclausal* reanalyses),

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1 Language processing differences between children and adults could also contribute, but I set these aside here. Note that Biberauer (this volume) also considers these relevant factors to the role of children in change.

2 Input-divergence (Cournane 2017) is used very broadly, as a way to capture any child language properties that deviate from the input model the child learns from. This includes what we standardly call child "errors", without using that term, which assumes that there is a fixed target when learning a language and interim analyses are wrong. Rather "errors" are only such in comparison to the input/intake grammars, so I opt to call these "input-divergent" properties.

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children typically acquire the (potentially) innovative grammatical structure earlier than the conservative one as they develop complexity (e. g. they develop from *monoclausal* > *biclausal*). It is indeed not clear how these child interim syntactic structures relate to overgeneralization, if at all. Rather, syntactic innovations are typically attributed to *economy* principles, and syntactic learning is sometimes characterized as conservative, also not obviously related to overgeneralization. I'll show that neither economy in change nor child conservativity in syntactic development directly undermine the proposed model, as both are concerned with representational changes in grammars, not differences in quantitative patterns and changes-in-progress (the purview of incrementation and the IUM).

Finally I will say a few words on the case study on Norwegian gender-system changes laid-out in Westergaard (this volume). These elicited production data are a valuable contribution to the roles of children in changes-in-progress, and while the data patterns conflict with some aspects of the IUM as proposed, the overall approach of Rodina and Westergaard is in line with a child-learning-centered contribution to the directionality and shape of changes-in-progress.

## 1 Representations and quantitative patterns in overgeneralization and incrementation

### 1.1 Generalization, generally speaking

*Generalization* has been primarily discussed for rule-learning in the acquisition literature, but I am using the term in a broader sense, to capture the necessary learning process of extending acquired knowledge from learning instances to novel instances. In this sense, child learning is always about generalizing beyond the input, because the input is a finite usage sample and from it, children must abduce the grammatical representations that underlie the productive language of the input, building their own productive system. Why define generalization so broadly? Recall that *incrementation* covers a diverse set of phenomena from a linguistic theory perspective (“Incrementation may involve increase in frequency, extent, or specificity of a sociolinguistic variable”, Labov 2007: 346), all roughly “over and beyond” the input. Why draw on rule-learning literature to support child *overgeneralization*? This is the domain where the most evidence exists for children’s willingness to overgeneralize, in a way different from adults (e.g. Hudson Kam and Newport 2005; Schuler et al. 2016). *Overgeneralization* occurs when the child generalizes a rule (or other analysis)

too much, but “too much” is only defined when compared directly to the grammars of the input). Overgeneralization of an analysis constitutes input-divergence at the representational level (e. g. the learner posits an analysis in his grammar that is less constrained than in the input), and at the quantitative level (e. g. the learner uses his input-divergent representations productively, and child usage rates for the relevant analysis compared with input samples are overrepresented). To illustrate this distinction, when a child is learning the regular past-tense rule of English, each change in how she represents that rule in her grammar (i. e. its application environment, a list of exceptions, its application order with respect to more narrowly applicable sub-rules) affects her usage patterns for the expression of past tense. Therefore, her productive patterns will diverge from the input because her representations do.

## 1.2 Adding representational differences in child grammars into the incrementation story

Standard incrementation theory does not actively consider representational change-over-time in the learner (contra generative approaches to language change, which focus on representational differences between adult grammars in a descent relationship, and infer the learner analyses responsible), and rather argues that child productive patterns first match the caregiver as the child models her usage patterns after her caregiver, and then the child tunes into community age-graded usage patterns and aligns herself with the youth:

With respect to the second component of the transmission problem (that differences across generations are consistently in the same direction), *it must be the case that children infer the direction of change from the behavior of speakers of different ages in the speech community* [emphasis mine]. (Denis et al. 2019: 48)

The IUM differs because it locates the directional thrust of incrementation in the calculus of the learning process itself (intake from input increasing as a function of learning, as development proceeds for language and other cognitive abilities, clearly described for the MMM approach, Biberauer (this volume), see also (Gleitman et al. 2005)).

Variationist sociolinguists and developmental linguists have made different simplifications of the underpinnings of change in an effort to make progress in our respective areas of inquiry (A. T. Pérez-Leroux, pc), which have developed in parallel since the 1960s with little interaction. Sociolinguists

typically assume the child is initially inert with respect to language changes,<sup>3</sup> and then activated by increasing social sensitivity to (near-)peer-group productive-patterns and age-graded variation in the community. On the other hand, developmentalists typically assume the target language is inert (i. e. that there exists a fixed system to be learned by the dynamic, actively engaged child). In reality, both children and languages are dynamic systems that change over time. In Cournane and Pérez-Leroux (under review), we propose, “Theoretical diachronic syntax offers a contrasting perspective: children play an active role in language change, as creators and selectors of the target of change”. Sociolinguistic perception research (à la D’Onofrio 2015) is required with children to test between these hypotheses about whether children forge age-graded differences or tune into them (Cournane and MacKenzie in prep), as the standard sociolinguist production methods showing children more advanced for a change-in-progress being studied would be consistent with both an internal grammatical story and an external social-attuning strategy. We need to test whether children actually can and do tune into age-graded differences. It is completely possible that children may both contribute to the direction of change and carefully monitor usage rates and social stratification for variable components of their grammar.

## 2 Notes on syntax

### 2.1 Economy of reanalysis

What about language change pathways where innovations are more economical than corresponding input analyses? Diachronic syntactic reanalyses are typically characterized by the more innovative analysis being more economical than the conservative one (how economy is measured varies according to theoretical assumptions, see Roberts and Roussou 2003; van Gelderen 2004, i.a.), such as *biclausal* > *monoclausal* in the history of English modal verb constructions (e. g. Roberts and Roussou 2003). Children acquire increasing syntactic complexity as their intake of the input grows, and they build up their own representations for productive use. For example, child sentential productions begin as ostensibly

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3 For Labov, “[c]hildren begin their language development with the pattern transmitted to them by their female caretakers” (Labov 2001: 437). This *transmission* is distinct from how developmentalists think about acquisition from caregivers, because it is about the “transmission of change rates” for a community change in progress, rather than transmission of a representational system.

monoclausal and the type of complements verbs take appears to “grow”: first nominals, then small clauses, then TPs, and finally CPs (de Villiers and Roeper 2016). Therefore, in broad brush strokes, children develop syntactic complexity, going from e. g. *monoclausal* > *biclausal*, in contrast to language constructions in diachrony which appear to commonly lose complexity, going from e. g. *biclausal* > *monoclausal*.<sup>4</sup> In Cournane (2017), I argued “simpler” syntactic analyses in diachrony arise because children get arrested at an earlier stage of development, when their extant syntactic analyses are “simpler” than the analyses for the corresponding string-types in the input.<sup>5</sup> The child remaining earlier “missed” a cue to complexify (just as in the MMM approach), and thus the input-divergent stage actuated into a community-level change we were able to witness in the historical record. The implication is that we should look at stages of child syntactic representations just pre-input for predicted next steps in diachrony (see also Lee and Cournane 2019).

For at least some morphological cases, on a representational level, an overgeneralizing child is also an economical one, depending on which side of the relation we focus on. For example, overgeneralizing the English regular past tense to all verbs goes hand in hand with more economical rule representation for the expression of past tense (with no or fewer exceptions or competing rules). However, for structural syntactic reanalyses, whether more economical analyses are ever overgeneralizations on a representational level is unclear. However, bringing the discussion back to the quantitative differences explored in the incrementation of innovations through the speech community over time, a child structural analysis could underlie a *quantitative* overgeneralization in their productive language relative to that of the input. Let's consider a toy example. If Susie develops syntactically from economical structure A to more complex structure B, then structure A constitutes an input-divergent analysis (=innovation) along her learning path. Susie uses A in her productions, even

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4 N.B. how this differs from the modal semantics case study in the target paper, where modal verbs in both acquisition and change appear first to express only root meanings and later extend to epistemic meanings (see also Hacquard and Cournane 2016; Cournane 2017), showing parallel developmental trajectories.

5 From Cournane (2017: 21): “In sum, throughout development the child has interim analyses (forms) for syntactic strings consistent with the stage of her grammar; an interim analysis becomes her ultimate analysis if it: (a) captures the compositional meaning of the string, (b) is consistent with the rest of the grammar, and (c) is not sufficiently cued by the input to be complexified. In morphosyntactic reanalyses the child posits a new form (=structural analysis) for an existing meaning (the compositional meaning of a modalized verb). The new form in diachrony aligns with a simpler, earlier, stage in child development.”

after she has learned B.<sup>6</sup> Susie still uses A at age 4, and her peer group does too, so they reinforce each other and A actualizes. As a young teenager, Susie spends a lot of time babysitting her little cousin Polly. Just like when Susie was little, Polly goes through a stage of analyzing all input B structures as A, but now Polly also gets some genuine evidence for A structures in her input. Four-year-old Polly would plausibly have more A relative to B in her productive data sample than did Susie at the same age, showing incrementation of A relative to older speakers (e. g. Susie & Polly's parents: 0 % A, Susie, 5 % A, Polly 10 % A).

## 2.2 Conservativity and avoidance in syntactic learning

The toy example above illustrates how input-divergent representations in syntactic development could increment, with upcoming children boosting prior childrens' contributions, as children go through similar stages in development (both universally, but more importantly, for specific languages with similar input samples), but it sets aside several issues. To mention just one, it is incompatible with Snyder (2007, 2011)'s *Grammatical Conservatism* (GC): "Children do not make productive, spontaneous use of a new structure until they have both determined that the structure is permitted in the adult language, and identified the adults' grammatical basis for it." The GC is aimed at solving developmental problems (for Snyder 2007, 2011, how to reconcile the character of production data with the categoricity of learning syntactic parameters, among other things), and naturally does not focus on innovations or change-in-progress. However, in this form GC is incompatible with child-driven innovations – if we don't loosen it in some constrained ways so that children can and do posit and make productive use of analyses that are distinct from those of the input. Learners would need to assume the input attests an analysis that is not actually attested in the grammars of the input speakers (see Snyder 2017, who provides a case study for the role of GC in the rise of *do*-support in English, especially that children don't backtrack on grammatical decisions, so that if they encountered *do*-support evidence prior to V-to-I evidence they will not change their analysis. He relies on changes in adult usage affecting the input to resolve the actuation problem for *do*-support, in line with Lightfoot 1999). An important point for me with respect to the avoidance of productive use in GC concerns child omissions in production and how we treat them. Snyder (2007, 2011) argues that child productions are overwhelmingly

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<sup>6</sup> Children often show gradual or more fine-grained adoption of syntactic learning in their productions, one of the main critiques against classic parameter setting (see Hyams 1986; Snyder 2007; Westergaard 2008; Yang 2000).

grammatically correct, with few “errors of commission” (using a non-adult form, e. g. *me read book*), but crucially he considers very common and persistent “errors of omission” (leaving out functional material, e. g. *read book*) as not problematic to his main claim of grammatical correctness. Omissions are input-divergent, but it’s debated at what level, and if not on a representational level (i. e. planning or performance errors), they may not contribute to change (except perhaps, if children rely on input from other children still exhibiting omissions). However, if omissions indicate representational differences (e. g. different parameter settings, different feature bundlings), then omission-containing utterances do show productive use of a non-adult analysis.

## 2.3 Changes in the Norwegian gender system

Westergaard (this volume) brought a change in the Norwegian nominal gender system to bear on the issue of child contributions to incrementation, with respect to the Inverted-U Model. The data is elicited production data from an apparent-time cross-section of different age groups from 3;6 to 67, for gender marking (Masculine, Feminine, Neuter) in Tromsø Norwegian. Children over-generalize Masculine forms, especially using the Masculine indefinite article with Feminine nouns and to a lesser extent with Neuter nouns (Rodina and Westergaard 2015: Exp. 1). One of the main research goals of Rodina and Westergaard (2015: 179) was to ascertain “whether gender is late acquired in Norwegian or whether there is a change in progress.” This either-or question fits well with the standard developmental vs. sociolinguistic assumptions in § 1.2: (a) is the gender system stable, but children take a long time to attain target, or (b) is there language change-in-progress, so children are adapting to a variable input (perhaps conflicting gender marking patterns from adults vs. older children). Also fitting well in the present discussion, they answer their question as follows (p. 179):

The two experiments reported here indicate that it is both. That is, Norwegian children have massive problems with gender, both in the feminine and the neuter. In addition, while there is an age effect found for neuter, indicating that children do learn this at some stage (around age 7), this is not attested for the feminine nouns, where there is no development across the three age groups (3;6–12;8); there is, in fact, a decrease in accuracy. This indicates that the feminine gender is in the process of [being] lost in the Tromsø dialect.

Therefore, there is a change-in-progress for loss of feminine, but it is new and spearheaded by children’s input-divergent analyses.

Rodina and Westergaard's conclusion as to the source of representational changes (i. e. directional changes in the genders of specific nouns, Fem > Masc), and quantitative directionality of change is contra the standard sociolinguistic view of incrementation because it considers the directionality of the change-in-progress to come from the acquisition process, based on, (a) the emergence of the repeated, directional, change of loss of Feminine (the Proto-Germanic 3-gender system has levelled to two-gender systems, via loss of distinct Feminine markings, in many daughter languages, e. g. Standard Dutch, *Common* vs. *Neuter*), which suggests a grammatical asymmetry (see their papers for details ruling out external factors like frequency for directionality in the Norwegian case studies), and (b) on the empirical samples from elicited production studies which show Neuters approaching adult-like accuracy levels by age 7, but Feminines plateauing. Remarkably, the input continues to provide a stream of evidence for noun gender, but while children continue learning for Neuter they get arrested at a base level for Feminine. Consider also Westergaard (this volume)'s conclusion that, "[It] seems more likely that this distribution illustrates that this language change has started so recently and is happening so fast that it has not yet reached the adult generation (and has only partly affected the teenagers)", and note that this too provides a case for age-graded apparent time change-in-progress data that doesn't fit the standard sociolinguistic model, as children could not tune into the age-grading in the community to align themselves with the change-in-progress if it did not exist in the community. One could argue there is no social dimension to this change, but that doesn't seem correct as the authors note, "[t]he older school children (Group 3) seem to be aware of this. For instance, one of them mentioned after the experiment that using the feminine form *ei* is considered "uncool" in that age group" (Rodina and Westergaard 2015: 180).

In the IUM, I left the x-axis timeline somewhat "open jaw", as I expect differences by domain (e. g. phonetic, morphological, syntactic, semantic) and by language-specific factors, but sketched overgeneralization as a childhood phenomenon, followed by retraction towards the adult-rates at preadolescence, lastly followed by a socially-motivated upswing, in an attempt to jive with the oft-observed age 17 peak for usage of the innovative variant (which I also argued is a *secondary* peak, at least for the case studies I discussed, with a higher peak at the time of learning and ensuing overgeneralization). So, what is happening with Norwegian Gender? There seems to be no upswing between preadolescence and adolescence, rather retraction toward the adult rates occurs for the Neuter, but not for the Feminine, which remains "lost" to overgeneralization for most nouns (and adult input seems not to have much power to correct overgeneralizations). Why some changes-in-progress complete rapidly (over just a couple generations, Norwegian gender reorganization) and



others very slowly (over many centuries, root > epistemic modal usages for lexical items like *must* (e. g. Traugott 1989)) is beyond the scope of this article, but possibly social contexts like certain kinds of contact situations can accelerate certain changes (Breitbarth and Walkden, this volume, and references therein), and the grammatical domain of change likely matters as well. For the Norwegian case study, the social context is distinct from prior generations (e. g. they note there is more language contact in the community in recent times), and childrearing practices have also changed (e. g. they note that early placement in daycares is culturally new) – the sociolinguistic factors Rodina and Westergaard refer to as precipitating the change<sup>7</sup> – both potentially giving overgeneralization of the Masculine enough wind in its sails to actuate among children.

### 3 Conclusion

My main argument has been that ubiquitous innovative representations along the learning path have the potential to contribute to quantitative differences in child usage compared to input usage throughout the long learning path.<sup>8</sup> I have highlighted important differences among development and change theories for whether they target representational or quantitative levels of language. This approach unites insights about child learners from representation-focused generative change theory (Lightfoot and Westergaard 2007 for overview), with insights about the development of quantitative variables for usage-focused changes-in-progress from variationist change theory (Denis et al. 2019; Labov, 2001, i.a.). I'll leave on this note: it is also abundantly clear that attempts to draw together lines of literature on change theory face issues of differences between domains of inquiry and methodological choices. While we all appeal to child learners as playing an important role in input-divergence of some kind, (a) sociolinguistic theory is based primarily on phonetic case studies using naturalistic production data, (b) child overgeneralization behaviors are based primarily on morphological rule-learning using primarily spontaneous and

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7 “The change is presumably due to sociolinguistic factors, but we argue that the nature of the change is due to the process of language acquisition, [...]” (Rodina and Westergaard 2015: 183).

8 When looking at morphological, syntactic, and semantic acquisition, a reasonable window is until at least age 7, if not preadolescence. I note this point here as sociolinguistic quantitative data from prepubescent children is plausibly affected by “incomplete” child learning of the language aspects under study, at the representational level, in lieu of or in addition to, being affected by child sensitivity to socially-structured usage variation such as age-grading.

elicited production data, (c) conservativity, economy, and MMM theories are based primarily on morphosyntactic case studies using spoken corpus data, elicited production data and/or written historical data, and laying bare my biases, (d) my work has focused on form-meaning relations for modal verbs using corpus and elicited production, and comprehension tasks. These differences underline the need for inter-subdisciplinary discussion and collaboration to make further progress in our understanding of interrelationships between language development in the child, language communities, and historical records.

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