The 3rd *Formal Ways of Analyzing Variation* Conference
FWAV3

May 18 – 19, 2016
New York, NY

FWAV3: Welcome

Dear Friends,

The FWAV3 Organizing Committee welcomes you to New York City!

Both the City University of New York (CUNY) and Michigan State University (MSU) are very happy to be hosting the 3rd *Formal Ways of Analyzing Variation* Conference.

Just a word about the institutions involved:

Many of the CUNY linguists you will meet at FWAV3 have two academic homes. The numerous CUNY colleges in Brooklyn, Queens, The Bronx, Manhattan, and on Staten Island serve as the base-campuses for most of us. At the same time, the Program in Linguistics at The Graduate Center (where FWAV3 is being held) serves as a focal point of activity for our shared scholarly interests. Thus, the joint involvement of the College of Staten Island, Queens College, and The Graduate Center in the organization of FWAV3 is emblematic of the cooperation of CUNY linguists spread out across the five boroughs of our great city.

And as you might have noticed, MSU has also participated in the organization of FWAV3! This further underscores the popularity of FWAV, and the desire to join forces across institutions in order to keep such a compelling conference alive. We hope that you will benefit from the results of our collaboration, and be inspired to help us all continue this young FWAV tradition into the future.

Please do not hesitate to ask the FWAV3 organizers and helpers for any assistance during the conference. We look forward to making your two days with us productive and enjoyable.

Our best regards,

The FWAV3 Organizing Committee
Christina Tortora (College of Staten Island & The Graduate Center)
Alan Munn (Michigan State University)
Bill Haddican (Queens College & The Graduate Center)

Contents

Acknowledgements: Sponsors

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- The CUNY *Advanced Research Collaborative*
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- Michigan State University
- Participants like you

Acknowledgements: Program Committee and Others

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And finally, thanks go to **Anton Ingason** and **Einar Freyr Sigurðsson** for starting the FWAV tradition in 2013, for continuing it with FWAV2 in 2015, and for passing the torch to us.

3rd Meeting of *Formal Ways of Analyzing Variation*
May 18 – 19, 2016

CUNY Graduate Center, New York, NY
365 Fifth Ave., New York, NY 10016

PROGRAM [as of May 8, 2016]

Wednesday, May 18, 2016

8:00am – 9:00am: BREAKFAST (Room C204/C205)	
9:00-9:30am: Opening Remarks: **Gita Martohardjono**, Chair, Program in Linguistics, CUNY Graduate Center	
Session 1: 9:30am – 10:50am Chair: Ricardo Otheguy	9:30am – 10:10am *What variation reveals about morphology* **Gregory Guy**
	10:10am – 10:50am *A stationary frequency effect in Manchester English* **Ricardo Bermúdez-Otero, Maciej Baranowski, George Bailey & Danielle Turton**
10:50am – 11:20am: BREAK	
Session 2: 11:20am – 12:40pm Chair: Stephanie Harves	11:20am – 12:00pm *Syntactic variation as a consequence of Variable Impoverishment in Fula objects* **Daniel Duncan**
	12:00pm – 12:40pm *A Formal Analysis of Variation in Catalan Personal Articles* **Judy Bernstein, Francisco Ordóñez, & Francesc Roca**
12:40pm – 2:40pm: LUNCH (on your own)	
Session 3: 2:40pm – 4:00pm Chair: Janet Fodor	2:40pm – 3:20pm *Detecting grammatical properties in usage data* **Anthony Kroch & Beatrice Santorini**
	3:20pm – 4:00pm *Evaluating the inevitability of phonological change:* /ae/ *in Philadelphia* **Betsy Sneller & Josef Fruehwald**
4:00pm – 4:30pm: BREAK	
Session 4: 4:30pm – 5:30pm Chair: Charles Yang	**INVITED SPEAKER: Cristina Schmitt** *What can language acquisition tell us about variability and grammar*
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Thursday, May 19, 2016

8:30am – 9:30am: BREAKFAST (Room C204/C205)	
Session 5: 9:30am – 10:50am Chair: Cristina Schmitt	9:30am – 10:10am *Going beyond the input: Three factors and variation, change and stability* **Theresa Biberauer**
	10:10am – 10:50am *The comprehension of 3rd person subject-verb agreement by low SES NYC English-speaking preschoolers acquiring different varieties of English: A multidimensional approach* **Isabelle Barriere, Sarah Kresh, Katsiaryna Aharodnik, Geraldine Legendre & Thierry Nazzi**
10:50am – 11:20am: BREAK	
Session 6: 11:20am – 12:40pm Chair: Alison Biggs	11:20am – 12:00pm *The logistic language learning curve?* **Hezekiah Akiva Bacovcin & Christopher Ahern**
	12:00pm – 12:40pm *Mathematical modeling of grammatical diversity supports the historical reality of formal syntax* **Andrea Ceolin**
12:40pm – 2:40pm: LUNCH (on your own); FWAV BUSINESS MEETING 2:10pm-2:40pm in C204/205): Anyone interested in the future of FWAV is welcome	
Session 7: 2:40pm – 4:00pm Chair: Richard Kayne	2:40pm – 3:20pm *An experimental approach to the syntax of* 'have yet to' *constructions* **Greg Johnson & Kali Morris**
	3:20pm – 4:00pm *Micro-variation in the* Have Yet To *construction* **Jim Wood & Matthew Tyler**
4:00pm – 4:30pm: BREAK	
Session 8: 4:30pm – 5:50pm Chair: Jon Nissenbaum	4:30pm – 5:10pm *Microvariation in American English applicative structures* **Jim Wood & Raffaella Zanuttini**
	5:10pm – 5:50pm *The innovation of an animacy condition: Conditioning environments for dative shift* **Hezekiah Akiva Bacovcin**
5:50pm – 6:00pm	**Closing Remarks**
7:00pm – 10:00pm	**Conference Dinner**, *Via Emilia*, 47 East 21st Street, NY, NY 10010

FWAV3 Authors

NAME	AFFILIATION	EMAIL
Katsiaryna Aharodnik	CUNY Grad Center & YVY Research Inst.	ogorodnichek@gmail.com
Christopher Ahern	University of Pennsylvania	christopher.ahern@gmail.com
Akiva Bacovcin	University of Pennsylvania	bacovcin@ling.upenn.edu
George Bailey	University of Manchester	george.bailey@manchester.ac.uk
Maciej Baranowski	University of Manchester	maciej.baranowski@manchester.ac.uk
Isabelle Barrière	LIU, YVY Research Inst., & CUNY GC	barriere.isa@gmail.com
Ricardo Bermúdez-Otero	University of Manchester	r.bermudez-otero@manchester.ac.uk
Judy Bernstein	William Paterson University	jbb8@nyu.edu
Theresa Biberauer	U. of Cambridge & Stellenbosch University	mtb23@cam.ac.uk
Luca Bortolussi	Università di Trieste	luca@dmi.units.it
Andrea Ceolin	University of Pennsylvania	ceolin@sas.upenn.edu
Daniel Duncan	New York University	dad463@nyu.edu
Josef Fruehwald	University of Edinburgh	jofrhwld@gmail.com
Cristina Guardiano	Università di Modena e Reggio Emilia	cristina.guardiano@unimore.it
Gregory Guy	New York University	gregory.guy@nyu.edu
Monica Alexandrina Irimia	University of York	monica_alexandrina@yahoo.com
Greg Johnson	Louisiana State University	gjohn2517@gmail.com
Sarah Kresh	CUNY Graduate Center	sarahkresh@yahoo.ca
Anthony Kroch	University of Pennsylvania	kroch@change.ling.upenn.edu
Géraldine Legendre	Johns Hopkins University	legendre@jhu.edu
Giuseppe Longobardi	Università di Trieste & U. of York	giuseppe.longobardi@york.ac.uk
Dimitris Michelioudakis	University of York	dimitris.michelioudakis@york.ac.uk
Kali Morris	Michigan State University	bybelkal@msu.edu
Thierry Nazzi	CNRS - Université Paris Descartes	thierry.nazzi@parisdescartes.fr
Francisco Ordóñez	Stony Brook University	francisco.ordonez@stonybrook.edu
Nina Radkevich	University of York	nina.radkevich@york.ac.uk
Francesc Roca	Universitat de Girona	francesc.roca@udg.edu
Beatrice Santorini	University of Pennsylvania	beatrice@sas.upenn.edu
Cristina Schmitt	Michigan State University	schmit12@msu.edu
Andrea Sgarro	Università di Trieste	sgarro@univ.trieste.it
Betsy Sneller	University of Pennsylvania	betsysneller@gmail.com
Danielle Turton	Newcastle University	danielle.turton@ncl.ac.uk
Matthew Tyler	Yale University	matthew.tyler@yale.edu
Jim Wood	Yale University	jim.wood@yale.edu
Raffaella Zanuttini	Yale University	raffaella.zanuttini@yale.edu

FWAV3 Abstracts

What variation reveals about morphology

Gregory Guy
New York University

Variable phonological processes are often sensitive to morphological structure, in that they differentiate between forms that are phonologically similar but morphologically distinct. Thus *mist*, *bold* undergo coronal stop deletion (CSD) at higher rates than homophonous past tense verbs *missed*, *bowled*. Such quantitative differentiation between form classes provides observable evidence about the (unobservable) underlying morphology of those classes. This paper explores the use of quantitative evidence to illuminate or resolve three types of morphological issues: lexical representation, morphological structure, and derivation.

The mental representation of lexical items is illuminated by lexical exceptions to variable phonological processes: certain function words and discourse markers that appear to show the output of the variable process at exceptionally high rates. Thus studies have shown that English *and* occurs without its final coronal stop at a much higher rate than other comparable words like *hand* (80% vs. 29%,), and Caribbean Spanish *entonces*, *pues* ('so, well') show more final *-s* absence than comparable monomorphemic words like *menos* (54% vs. 16%) Such cases indicate that the exceptional forms have multiple underlying representations: /an/ as well as /and/, /entonce/ as well as /entonces/.

The internal morphological structure of lexical items is revealed by differential sensitivity to variable processes. Thus for some speakers, the irregular class of English past tense forms *left*, *kept*, *told* undergo CSD at the same rate as underived words like *lift*, *bold*, indicating that these forms are treated as unanalyzed wholes, without internal structure: /left, told/. Other speakers, however, show systematically lower deletion rates in such words, indicating an analysis that treats the final stop as an affix: /lef+t, tol+d/.

Derivational processes can be revealed by their interaction with other constraints. Thus high lexical frequency is often associated with elevated rates of phonological lenition processes (cf. Bybee 2001). This is true of underived words affected by CSD, but not regular past tense forms. Thus in one corpus we find underived (monomorphemic) deletion rates of 33.9% in high frequency words vs. 18.5% in low frequency items, significant at the $p<.01$ level. For regular past tense forms in the same corpus, the high frequency items show 8.2% deletion, while low frequency forms are not significantly different, at 7.3% ($p>.70$). This suggests that the past tense forms are actively derived in production, not stored in memory; hence they lack the mental representations, or exemplars, that Bybee postulates as the targets that drive high frequency lenition.

Bybee, Joan. 2001. *Phonology and language use*. Cambridge: Cambridge University Press.

A stationary frequency effect in Manchester English

Ricardo Bermúdez-Otero[1], Maciej Baranowski[1], George Bailey[1], and Danielle Turton[2]
University of Manchester[1], Newcastle University[2]

The impact of lexical token frequency on phonetic implementation has been argued to support Exemplar Theory in the following way (Bybee 1998, 2002; Pierrehumbert 2001, 2002):

(a) Synchronically, high-frequency lexical items exhibit more coarticulation and reduction than low-frequency items (e.g. Dinkin 2008, Gahl 2008, Myers & Li 2009, among many others).
(b) This is because, in diachronic processes of lenition, frequent words change at a faster rate than infrequent ones.
(c) In turn, this is because high-frequency items suffer greater exposure to phonetic biases in production and perception than low-frequency items, and the effects of this difference are directly registered in phonetically detailed lexical representations.

This argument suffers from several problems. Hypothesis (b) has not been corroborated by actual diachronic observations in real or apparent time. Indeed, (a) does not logically entail (b): as acknowledged by Hay *et al.* (2015), frequent items can be ahead of infrequent ones, and yet change at the same rate. In such a scenario, the impact of frequency gives rise to a **constant rate effect** (CRE) in the sense of Kroch (1989): when modelled as logistic functions, the curves of change for high- and low-frequency items exhibit different intercepts but equal slopes. The existence of CREs in phonology was established by Fruehwald *et al.* (2013). Zellou & Tamminga (2014) report change in nasal coarticulation affecting high- and low-frequency items at the same rate. As regards (c), the empirical predictions of Exemplar Theory remain unclear. Sóskuthy (2014) shows that, in the absence of *ad hoc* stipulations, the inertia of a large exemplar cloud will cancel out the effects of greater exposure to phonetic bias. In addition, Hay *et al.* (2015) propose an exemplar-based account for a sound change apparently led by **low-frequency** words.

In this paper, we challenge (b) with evidence from a CRE in /t/-glottalling in Manchester. As expected, token frequency has a strong effect on /t/-glottalling, but there is no significant difference in the diachronic growth rates of glottalling in high- and low-frequency words. We demonstrate this statistically using LOESS-smoothers, mixed effects logistic regression, and Kauhanen & Walkden's (2015) mathematical model of the CRE. Our data come from a sociolinguistically stratified sample (62 speakers born between 1926-1985; 9,187 tokens of /t/ auditorily coded). Figure 1 (with data from word-medial /t/) shows that the curves of change in apparent time for high- and low-frequency items are not significantly different. Figure 2 shows the results of applying Kauhanen & Walkden's CRE model, which uses time-invariant contextual biases to derive context-specific curves from a single logistic growth function for all contexts (in this case, for all frequency bins). The model can be used diagnostically by comparing the error rates of CRE-constrained curves against independent logistic curves for each frequency bin. Fitting this more constrained model, with the CRE built in, leads to no increase in error over a model with completely independent logistic curves.

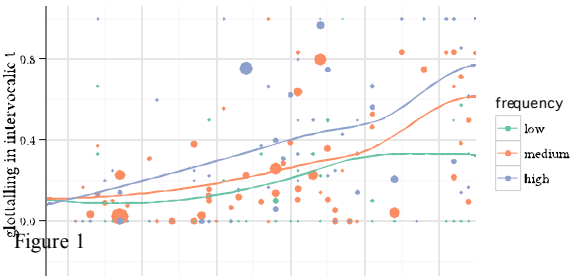

Figure 1

Further support comes from generalized mixed-effects logistic regression, which shows that an interaction between Zipf-scaled frequency (SUBTLEX-UK; van Heuven *et al.* 2014) and birthyear does not improve on a model without the interaction (by AIC or BIC). We conclude that the evidence stacks in favour of a scenario in which high- and low-frequency words change at the same rate, thus providing support for a CRE in Manchester /t/-glottalling.

The absence of evidence for (b) suggests that alternatives to (c) should be considered. Frequency-driven CREs are consistent with modified versions of classical modular architectures in which neogrammarian innovation is effected through change in phonetic implementation rules referring to phonological categories in surface representations, whilst the impact of frequency is produced by orthogonal mechanisms (e.g. cascading activation, listener modelling).

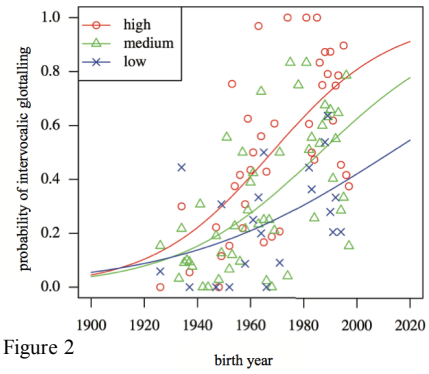

Figure 2

Syntactic variation as a consequence of variable Impoverishment in Fula objects

Daniel Duncan, New York University (dad463@nyu.edu)

Overview: Fula is a fusional language which builds complex verbs through head movement (Damonte 2007). Morphemes in these verbs have a fixed order, with a hierarchical structure following the Mirror Principle (Baker 1985). Dialects vary as to the amount of subject/object agreement displayed on the verb. I focus on the Pular dialect spoken around Conakry, Guinea, which has no subject agreement but limited object agreement. Situations where object agreement is licit are subject to intraspeaker syntactic variation. In the alternative variant, an object pronoun complement of the verb may cliticize with no overt agreement:

1. Mi hi'-**e**-no.
   1.NOM see-2OBJ-PST
   I saw you.

2. Mi hi'-u-no=**ma**.
   1.NOM see-ACT-PST=2.ACC
   I saw you.

These morphemes may not co-occur:

3. *Mi hi'-**e**-no=**ma**.
   I saw you.

This clitic/agreement alternation is additionally subject to categorical constraints. Using an approach rooted in Distributed Morphology (Halle and Marantz 1994), I first offer an analysis of the categorical alternations. Based on this analysis, I show that the syntactic variation is the consequence of variable Impoverishment of features in the agreement marker.

Agreement: Agreement is only marked for 1st and 2nd person singular objects as *–an* and *–te*, respectively (post-syntactic phonetic and phonological operations affect the surface form in the verb). Given that the alternative variant to agreement is cliticization, we might ask whether this is actually agreement, or perhaps rather clitic climbing (see Myler To appear). Two pieces of evidence support the view that it is agreement: first, the agreement marker *–te* for the 2nd person is completely different from the pronominal *ma*. Secondly, because Fula verbs are built through head movement, in order to be an instance of clitic climbing, the markers would need to move past the verb into a functional head before the verb then moves through said head. As agreement, we may instead simply posit that the markers take their place within the fixed order of morphemes on an AgrO head.

Clitics: Object pronouns that appear as verbal complements are clitics (Kaufman 2002), as can be seen from Double Object constructions: when there is a pronominal and full DP present, the pronominal must be adjacent to the verb. There is no such constraint on the order of full DP objects.

4. Ñaariiru ndun junn-i=lan ñaamete.
   cat DEF give.PRS=1.ACC food
   The cat gives food to me.

5. *Ñaariiru ndun junn-i ñaamete lan
   The cat gives food to me.

This fact, among others, suggests object pronouns move closer to the verb than remaining *in situ*, perhaps Spec,AgrOP.

Categorical Alternations: In addition to person constraints on object agreement, other factors categorically constrain agreement from occurring. Agreement is sensitive to polarity; clitics are found when the verb is marked for negation. At the same time, only certain Tense/Mood/Aspect elements are compatible with agreement. Verbs marked for distant future or distant past are, but not present/recent past or habitual/near future.

Note that if we take the agreement morphemes to be occupying AgrO and clitics to be in Spec,AgrOP, we must fill AgrO with something even when agreement is not overt. That is, in these cases AgrO contains ø. As such, the agreement markers *–an, -te* are subject to allomorphy.

Here, they are specified with features [+participant, -pl]. In contrast, ø is underspecified for these features, appearing elsewhere. This means that the presence of negation or an improper TMA element trigger Impoverishment rules. Their presence deletes the [+participant] feature of the agreement marker, yielding the elsewhere allomorph ø.

This accounts for the presence or absence of object agreement. What about the presence or absence of the pronominal clitic? I suggest that this may be accounted for by taking Fula to be an obligatory pro-drop language: when AgrO is filled with an overt element, the verbal complement must be *pro*. Under this view, overt agreement expressly blocks overt complements. In contrast, when ø fills AgrO, there is no overt element, and the verbal complement surfaces. Thus, we may account for the categorical alternations between agreement/cliticization as a direct result of the Impoverishment of the agreement markers.

Variation: While the categorical Impoverishment rules above explain the absences of agreement in certain conditions, they do not explain why there is intraspeaker variation between agreement and cliticization where agreement is licit. Consider the agreement paradigm that has been developed, however (below). As seen, the typical agreement marker is ø, with allomorphy in the few cases with a possible overt element. Following Nevins and Parrott (2010), I suggest that in cases where agreement is licit, variable Impoverishment rules determine the expression of this marker. In effect, object agreement is marked in all situations: in some, like negation, Impoverishment of [+participant] is categorical. In others, like distant past, this Impoverishment is variable. As such, there is paradigm leveling toward ø for all persons, seen in variation between an overt element and ø. While this approach is similar to that of Nevins and Parrott (2010), it extends into explaining the syntactic variation we observe as well, due to Fula having obligatory pro-drop. When the variant selected is the overt marker, an overt complement is blocked. When ø is selected, the complement surfaces.

	Singular	Plural
1st	-an/ ø	ø
2nd	-te/ø	ø
3rd	ø	ø

Discussion: This is an appealing description because paradigm leveling is well-attested cross-linguistically and this account simply extends that of the categorical alternations. While this account successfully describes the observed categorical alternations and intraspeaker variation, its greater success lies in paving the way for further research using variationist methodologies. Note that because DM relies on Late Insertion of Vocabulary Items, the variable Impoverishment that triggers syntactic variation is occurring in PF after the syntax has fed LF. As such, under the proposed account the two forms seen in (1-2) are equivalent in LF. This is important, as variationists have shied away from syntactic variables in the past because it is not clear they satisfy Labov's Principle of Accountability (Labov 1972, Lavandera 1978). Showing syntactic variants to be equivalent in LF shows they satisfy this Principle, opening the door for further research of the factors that condition the observed intraspeaker variation.

References: Baker, M. 1985. The Mirror Principle and morphosyntactic explanation. *LI* 16: 373-415. **Damonte**, F. 2007. The Mirror Principle and the order of verbal extensions: Evidence from Pular. *On-line Proceedings of the Fifth Mediterranean Morphology Meeting (MMM5)*: 337-358. **Halle**, M., and A. **Marantz**. 1994. Some key features of Distributed Morphology. *MIT Working Papers in Linguistics* 21: 275-288. **Kaufmann**, I. 2002. Die interaktion von ereignis- und argumentstruktur in aktiv/medium-systemen am beispiel des Fula. *Linguistiche Berichte* 191: 299-342. **Labov**, W. 1972. Sociolinguistic patterns. Philadelphia: University of Pennsylvania Press. **Lavendera**, B. 1978. Where does the sociolinguistic variable stop? *Language in Society* 7(2): 171-182. **Myler**, N. To appear. Cliticization feeds agreement: A view from Quechua. *NLLT.* **Nevins**, A., and J.K. **Parrott**. 2010. Variable rules meet Impoverishment theory: Patterns of agreement leveling in English varieties. *Lingua* 120: 1135-1159.

A Formal Analysis of Variation in Catalan Personal Articles

Judy B. Bernstein, William Paterson University
Francisco Ordóñez, Stony Brook University
Francesc Roca, Universitat de Girona

Proper names are usually analyzed as nominal constructions that involve a DP projection. According to Longobardi (1994) proper names in Romance languages raise to the empty D in most cases:

(1) a. [$_{DP}$ D [$_{NP}$ Juan]] llegó tarde. (Spanish)
b. [$_{DP}$ [$_{D}$ Juan$_i$] [$_{NP}$ t$_i$]] llegó tarde.
'Juan arrived late.'

In contrast, proper names in Mallorcan Catalan (MC) are introduced by a specialized article *en* (m.) or *na* (f.), which Longobardi labels 'expletive'. So the proper name in MC remains in situ and D is filled by this article:

(2) [$_{DP}$ [$_{D}$ en] [$_{NP}$ Joan]] va arribar tard (Mallorcan Catalan)
EN Joan arrived late

In this presentation we will show that this proposal is insufficient. In fact, MC *en-na*, which we label a 'personal article', patterns with regular definite articles only in certain contexts, and otherwise it patterns with honorific titles. In contrast, Central/Oriental Catalan has a mixed system: the masculine form patterns with MC personal articles and the feminine form with regular definite articles. In what Ledgeway (2012:100) labels 'substandard Catalan', both feminine and masculine forms pattern with regular definite articles. We will show that the forms of the articles correlate with syntactic differences, which support the proposal that they correspond to different positions in the DP.

In MC, regular definite articles differ from personal articles in the following ways:

a) Personal articles cannot be pluralized but regular definite articles can:

(3) a. **ens* vs. *els* (M.PL) (Mallorcan Catalan)
b. **nes* vs. *les* (F.PL)
'the'

b) Prenominal adjectives (e.g., *propi* or *mateix*) cannot appear between personal article and noun, but can between regular definite article and noun:

(4) a. *en propi Pere (Mallorcan Catalan)
b. el propi professor
'the same Pere/professor'

c) Personal articles cannot introduce relative clauses but regular definite articles can:

(5) a. *en Pere que va arribar ahir (Mallorcan Catalan)
b. el professor que va arribar ahir
the Pere/professor that arrived yesterday

On the other hand, MC *en-na* shows parallelisms with honorific titles like Spanish *don-doña* (to which it is etymologically related). As we saw for *en-na* in (3)-(5), *don-doña* cannot be pluralized ((6a)), cannot be followed by a prenominal adjective ((6b)), and cannot introduce a relative clause ((6c)).

(6) a. *dones, *doñas (Spanish)
b. *don mismo Luis
c. *Don Luis que llegó ayer

In order to account for these facts we propose that personal articles like *en-na* and titles like *don-doña* must be analyzed as nominal classifiers occupying a Class(ifier) projection between D and N:

(7) [$_{DP}$ D …… [$_{ClassP}$ CL *en-na* …… [$_{NP}$ N]]]

Crucial evidence in favor of postulating this more articulated structure is provided in (8), where both a definite article and a personal article are expressed: a prenominal adjective appears between the higher D head and the lower Classifier head.

(8) el petit en Joan (Mallorcan Catalan)
the small EN Joan

The example recalls the use of multiple determiners in Scandinavian 'double definiteness' languages: one definite determiner introduces a prenominal adjective and another is associated

(as an enclitic) with the noun (see Julien 2005, Delsing 1993, Kester 1996, Vangsnes 1999, Santelmann 1993, Holmberg and Platzack 2005, among many others).

This Classifier position encodes syntactic and semantic values like [+human] and [-plural] as well as specifications concerning familiarity and title/honor. The development of *en-na* and *don-doña* from Latin *dominus* can be seen as an instance of grammaticalization of the functional head Class, which is consistent with the loss of number inflection (as with other cases of grammaticalization; Roberts 2007, Roberts and Roussou 2003). Our ClassP differs from that of Picallo (2008), which concerns the expression and interpretation of grammatical gender in Romance languages.

Although we treat *en-na* and *don-doña* as classifiers, there are differences between them:
a) Whereas *don-doña* is a title that expresses a kind of honorific treatment, *en-na* expresses familiarity with the referent: *en Chomsky* versus *Chomsky* indicates a difference in familiarity.
b) Whereas *don-doña* participates in lexicalization processes that include the proper name (*donjuán* 'womanizer', *don nadie* 'unimportant person', *dondiego* 'kind of plant'), parallel examples with *en-na* are not found.
c) Whereas *don-doña* can be used in vocatives, *en-na* cannot:

(9) a. ¡Don Luis! (Spanish)
b. *¡En Pere! (Mallorcan Catalan)

According to Bernstein (2008), vocatives are incompatible with elements that encode 3rd person, such as Romance *l-* determiners and *l-* pronouns, since this encoding clashes with the 2nd person nature of vocatives. The impossibility of *en-na* with vocatives suggests that 3rd person, as well as familiarity, is encoded with these elements as well. This contrasts with *don-doña*, which encodes honorific title but not 3rd person. Although under our analysis *el-la* (in D) and *en-na* (in Class) similarly encode 3rd person and familiarity, there is an important difference in the feature composition of the two functional heads: only the lower head (Class) encodes animacy.

As mentioned above, not all dialects of Catalan realize the Classifier position for all proper names. Thus, Central/Oriental Catalan limits its use to masculine proper names. For feminine proper names and nouns, it uses only the higher D head. For this reason, the feminine definite article always precedes a prenominal adjective in Central/Oriental Catalan, and cannot appear between the adjective and proper name:

(10) a. La petita Joana (feminine) (Central Catalan)
b. *La petita la Joana
the small (the) Joana

This cross-linguistic variation receives an explanation under our approach.

As expected, the feminine article *la* with proper names behaves like the regular definite article and differently from *en-na*: *la* can introduce relative clauses ((11)); and *la* can be pluralized when pluralization is required to indicate people with the same first or last name ((12)).

(11) la (Joana) que va arribar ahir (Central Catalan)
the (Joana) that arrived yesterday

(12) les Ripoll [vs. *nes Ripoll] (Central Catalan)
the-F.PL Ripoll (= the female members of the Ripoll family)

And given the restriction with *l*-forms discussed above, vocatives are also excluded with *la*:

(13) *¡La Maria! (Central Catalan)

We can explain the loss of the feminine classifier form (*na*) in this variety if we assume that, a) the masculine form for the Classifier head is the underspecified form, and b) the Classifier head in this variety has lost the ability to host the necessary word marker (*-a* in *n-a*) to indicate feminine.

Finally, we include the colloquial informal register of Central Catalan (substandard), which has lost *en* as well as *na*. Under our account this suggests that this variety of Catalan has lost the Classifier head altogether. In this respect then, the system of definite articles in substandard Central Catalan is like that of colloquial Spanish. Variation in the determiner system results from the interaction of the availability of functional heads plus the sensitivity of these heads to the gender underspecification for determiners.

The incompatibility of the D and Classifier heads preceding the noun (**el en Joan*) is resolved if we combine our idea of a tight relationship between *en* and proper name with Longobardi's proposal about N-to-D movement of proper names. Specifically, we claim that *en Joan* raises to the DP projection.

Detecting Grammatical Properties in Usage Data

Anthony Kroch and Beatrice Santorini
University of Pennsylvania

A well-known limitation on the utility of corpus data for linguistic research is the absence of negative evidence, just the evidence that is readily available in the data of acceptability judgments. Of course, in the case of historical investigations, judgment data is simply unavailable. In this situation, it is tempting but dangerous to assume that non-occurring configurations are ungrammatical. A better approach, widely adopted with the growing availability of digital corpora, especially annotated ones, is to make use of the frequency information in the corpora to infer properties of the grammars underlying observed usage patterns. The most obvious patterns are diachronic developments in which a form either arises from nothing or disappears, and it has always been assumed that these cases reflect grammatical change. A more ambitious use of frequency information has been work in the spirit of Kroch's"Constant Rate Effect" (Kroch 1989). In such work, evidence is assembled to show that distinct linguistic environments sharing a common innovative grammatical feature will evolve together over time. The CRE has by now been replicated sufficiently often to be accepted as reliable. Most recently, for example, Zimmermann (2015) has carried out a large scale replication involving a dataset of more than 50K instances of the English *do*-support environment.

Less well-known than the CRE is the pattern reported in Santorini (1993), Taylor (1994) and elsewhere where we see that grammatical options (for example, "extraposition") that are not undergoing change tend to be stable in their frequency of use in corpus data. This work also reports that grammatically independent options, like the extraposition of one XP or another or both in a clause that contains two such phrases, tend to be statistically independent; that is to say, if the probability of one occurrence of extraposition is p, then the probability of two occurrences will be approximately $p \cdot p$. Largely ignored in the literature, however, is the contrapositive implication that when options are statistically linked, we have evidence of grammatical linkage.

In this paper, we present evidence from four languages for which we have parsed historical corpora: English, French, Icelandic and Yiddish (Kroch and Taylor 2000, Martineau and et al. 2009, Wallenberg et al. 2011, Santorini 2008) of statistical linkage with grammatical implications and also of the loss of such linkage over the course of time. The data on which we rely is word order inside VP, where we find that these languages undergo a shift from XV to VX in multiple stages, two of which can only be distinguished by the presence versus absence of statistical linkage between different word order options. The pattern we have found, stated within the framework of antisymmetric syntax, is that XV surface word order has sources in leftward movements of two distinct types: (1) remnant scrambling of VP with the verb itself stranded in v and (2) scrambling of an XP argument/adjunct with VP remaining *in situ*. Since, under option 2, more than one XP may scramble and since, under option 1, XPs can be stranded after the verb via a sequence of XP scrambling followed by remnant VP scrambling, an identical range of surface orders is produced by the two options. Only quantitative evidence allows us to distinguish them. Concretely, we find the following quantitative patterns in our languages:

1. From their earliest attested periods, the languages exhibit leftward movement of single XPs across the verb, as expected under the XP scrambling option.

2. At the same time, in the earlier periods, the frequency of verb-final order in clauses with multiple XPs in pre-verbal position is much higher than expected, given the frequencies of single XP movement.

3. As reported for Ancient Greek in Taylor (1994), the frequencies of leftward movement of single XPs of a given syntactic type are largely independent of the presence of other XPs in the clause.

4. After initial periods with an excess of multiple XP in pre-verbal position, the frequency of XP>V orders declines in all four languages to that predicted by the rates of single XP scrambling.

From these results, we conclude that the loss of surface OV order in our languages proceeds in three stages. In the first, which antecedes our earliest records, the remnant scrambling of VP begins to be lost, leading to an alternation between XP>V and V>XP surface orders. At this time, XP>V order in clauses with one VP-internal constituent becomes ambiguous between a VP-movement derivation and one in which single XPs scramble leftward. In the second stage, the VP-movement option disappears so that XP>V order is always derived by XP scrambling. Finally, XP scrambling itself disappears or becomes restricted to quantificational expressions.

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Evaluating the inevitability of phonological change: /ae/ in Philadelphia

Betsy Sneller (University of Pennsylvania)
Josef Fruehwald (University of Edinburgh)

After a history of being at the nexus of a number of debates in phonology and sound change, (Labov, 1981; Kirparsky, 1993), the classic Philadelphia Short-a System (PHL) is being rapidly replaced by the nasal system (NAS) (Labov et al, 2015). One reasonable hypothesis is that the shift from the complex PHL to the simple NAS was inevitable, since learners would either innovate or prefer the simpler grammar. However, on the basis of recent work on productivity and grammar competition by Yang (2002, 2005), **we will argue that the "simpler" NAS would not be a tenable grammar given PHL input data**. PHL is defined in (1) (tense before tautosyllabic anterior [nasals or voiceless fricatives]), and NAS in (2) (tense before nasals).

(1) æ → tense / __ {m, n, f, θ, s}]$_{\sigma}$]$_{stem}$ (2) æ → tense / __ {m, n, ŋ}

There are multiple tense and lax lexical exceptions to (1) and it is not a surface-true generalization, since it applies at the stem level. NAS, on the other hand, has tense /æ/ before all nasals regardless of syllabicity, making (2) a surface-true generalization.

To evaluate the viability of (2) given input data from (1), we carried out both a productivity analysis, based on the Tolerance Principle from Yang (2005), which states that a rule can tolerate $T = N\ln(N)$lexical exceptions before it is more efficient to memorize all lexical items, and a grammar competition analysis based on Yang (2002), which states that if G_2 can parse more data from G_1 than vice-versa, G_2 will replace G_1.

We coded N=2,255 word types from the CHILDES database (MacWhinney, 2000) for whether they would be tense or lax under PHL. Given this input data, we evaluated whether a learner could plausibly hypothesize an underlying NAS grammar with listed lexical exceptions producing the PHL distribution. This would be a potential explanation for the actuation of the shift to NAS. Given PHL input data, a NAS grammar would have to list 426 exceptions, which exceeds T=292. **NAS is not a tenable grammar given PHL data**, thus reanalysis of PHL directly to NAS is not a plausible pathway of actuation.

Extending Yang's (2002) model of grammar competition to phonology is not straightforward, since the unambiguous contexts for G_{NAS} and G_{PHL} are perfectly overlapping. In order to carry out this analysis, we trained two Noisy-HGs (Boersma & Pater, 2007) on NAS and PHL data, then evaluated the accuracy of these Noisy-HGs when parsing data from the other grammar. PHL was more accurate parsing NAS data than vice versa (81.9% vs 79.8%). The difference is small, but according to Yang (2002) **this means PHL ought to win in grammar competition with NAS**.

We conclude from these analyses that NAS was not destined to replace PHL due to its formal simplicity. The fact remains, however, that NAS *is* replacing PHL, which should be anomalous given these results. We therefore tested whether one of two intermediate forms of PHL could have been tenable given Yang (2002, 2005). The first intermediate form tested was PHL without the tautosyllabic constraint, since some previous work suggests that the tautosyllabic constraint has weakened to some extent (Brody, 2009). The second possible intermediate form tested was PHL without the tense fricative conditioning, since pre-fricative contexts produce the least phonetically tense variants (Kroch 1996), possibly leading to misperception of tense [æ] in these contexts as lax.

In the productivity analysis, PHL without the tautosyllabic constraint would require too many listed exceptions to hypothesize NAS ($362 > T$), but PHL without fricative conditioning passes the tolerance threshold ($265 < T$). It would be possible for NAS to be actuated by a misanalysis of PHL-minus-fricatives, however, in an analysis of 94 Speakers from the IHELP corpus, there was no evidence that any speaker only lacked fricative conditioning while conforming to the remaining constraints. In the grammar competition analysis, PHL-minus-fricatives grammar parsing NAS data was roughly evenly matched with NAS parsing PHL-minus-fricatives data (84.7% vs 84.2%). Similarly, the PHL-minus-tautosyllabic grammar parsing NAS was also evenly matched with its counterpart (90.7% vs 90.2%).

In conclusion, the replacement of PHL by NAS was neither inevitable on the grounds that NAS is formally simpler, nor on grounds that it is dialectally more common. Rather, some additional change had to occur to PHL *first*, whether it was the misperception of tense [æ] in pre-fricative contexts, or the loss of the tautosyllabic constraint. These results echo the results of Fisher, Prichard & Sneller (2014), who found in case studies of families that there was never a direct transition between generations from PHL to NAS, but always an intermediate PHL system first.

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What can language acquisition tell us about variability and grammar

Cristina Schmitt
Michigan State University

It is well established that children are adept learners of the grammars of their languages, but at the same time are also adept at learning the sociolinguistic variability in the use of those grammars. What happens when these two types of learning come to interact with each other? Yang's variational model predicts that variability in the input which causes ambiguity can affect grammar choice, modeled as grammar competition. In this talk I discuss two case studies of acquisition of number morphology which have different effects. In one case, Chilean Spanish, a phonological process of lenition of syllable-final /s/ leads to a delay in the acquisition of the plural, to the degree that at age 5 some children appear to have settled on a grammar in which grammatical number is not represented in the DP, despite there being other kinds of evidence for number in the form of verbal agreement. Other children, however, *do* arrive at the conclusion that their grammar has grammatical number and can use it proficiently in comprehension tasks. Importantly the variability found within Chilean children is bimodal: children either use number or they do not use number in the noun phrase. In the other case, Brazilian Portuguese, evidence for grammatical number is also obscured, but not by a purely phonological process, but by two arguably independent facts: sociolinguistically conditioned variability in the realization of agreement and number neutral bare nominals. The Brazilian children, unlike the Chilean children, show evidence of having acquired grammatical number in the DP, but also exhibit variability in using it as a cue in certain comprehension tasks. Unlike the variability found in the Chilean children, the Brazilian children exhibit intra-child variability.

These results raise a number of issues that will be addressed: from an acquisition point of view, we ask what the hypotheses are that children entertain with respect to number in the noun phrase and how differences in the input lead to very different intake and consequently different results by age 4-5? From a syntactic and semantic point of view we ask whether these results can help us understand the nature of the representations of grammatical number, agreement and concord in the adult grammar.

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

Theresa Biberauer
University of Cambridge & Stellenbosch University

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) è 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) è 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).

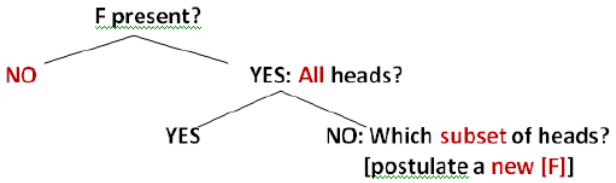
Even with a conceptually motivated proposal as to which aspects of the input matter for grammar acquisition – something that has, until now, been largely absent from generative models – the challenge that remains in the context of the type of emergentist approach I am advocating is how a non-UG-given [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).

The Comprehension of 3rd Person Subject-Verb Agreement by Low SES NYC English-speaking Preschoolers Acquiring Different Varieties of English: a Multidimensional Approach

Isabelle Barrière[1&2], Sarah Kresh[2&3], Katsiaryna Aharodnik[2&4], Géraldine Legendre[5], Thierry Nazzi[6]
[1]*Communication Sciences & Disorders, Long Island University, Brooklyn ;* [2]*Yeled V'Yalda Research Institute, Brooklyn*
[3]*Linguistics, Graduate Center, CUNY ;* [4]*Speech-Language-Hearing Sciences, Graduate Center, CUNY*
[5]*Cognitive Science, Johns Hopkins University, Baltimore ;* [6]*Psychology of Perception, CNRS-Paris Descartes, France*

Subject-verb agreement marking for 3rd Person Singular *–s* differs across varieties of English. Five and six-year old users of Mainstream American English (MAE), but not younger children, understand sentences that rely exclusively on the 3rd Person *–s* to indicate the singular subject (e.g. *the duck**ø** swim**s** in the pond* vs *The duck**s** swim**ø** in the pond*) (Johnson et al., 2005). Five to seven year olds speaking MAE rely on 3rd person *–s* as a generic tense marker and a verbal suffix, but younger children and those using a variety that greatly differs from MAE do not (De Villiers & Johnson, 2007). The present study investigated three issues:

(i) Whether the results obtained by Johnson et al. (2005) would extend to sentences in which the verb in sentence-medial position is followed by an adverb rather than a prepositional phrase and/or sentences in which the agreement marker is sentence final, given that the latter fosters better performances on younger children's perception (Sundara, Demuth & Kuhl, 2011);

(ii) Whether children speaking MAE would perform better in a video matching task than those acquiring a variety that combines features from MAE and non-mainstream varieties (Some Variation), who in turn would perform better than those speaking a non-mainstream variety (Strong Variation);

(iii) Which properties of the input best account for similarities and differences across children acquiring these varieties.

STUDY 1-COMPREHENSION: Twenty-six monolingual English preschoolers between 3;1 and 5;5 (Mean age: 4;4) were administered a video-matching comprehension task that included verbal stimuli such as *the boy**s** spin**ø** (freely/in the hall)* versus *the boy**ø** spin**s** (freely/in the hall)*. They were categorized as users of MAE (N=8), Some Variation (N=9) and Strong Variation (N=9) based on the Diagnostic Evaluation of Language Variety (Seymour et al., 2003) and attended three preschool programs in NY, each of which enrolls a majority of children from ethnically diverse (African-American, American-African, Asian, Caribbean, Caucasian and Hispanic) low SES background speaking different varieties, in contrast to De Villiers & Johnson (2007) where speakers of MAE and Strong Variation were recruited in different schools tied to different SES. Our analyses of the results considered both accuracy and sensitivity scores that neutralize possible bias towards singular or plural responses (Johnson et al., 2005):

(i) Position of the agreement marker and nature of the post-verbal phrase (PP or Adverbial) did not impact the results: across groups, there was no significant difference between these conditions (fig. 1, 2), which reveals that in this age range the saliency of the marker does not have the same effect on comprehension as it does in earlier stages on perception.

(ii) Only MAE users performed significantly above chance across conditions (fig. 1, 2). However there was no significant difference between users of Some Variation and Strong Variation (fig. 1, 2). Chronological age only impacted the results obtained by MAE users (fig.3), extending the results obtained by Johnson et al. (2005) and De Villiers & Johnson (2007) to sentences with sentence-final agreement markers and post-verbal Adverbials and to children acquiring Some Variation.

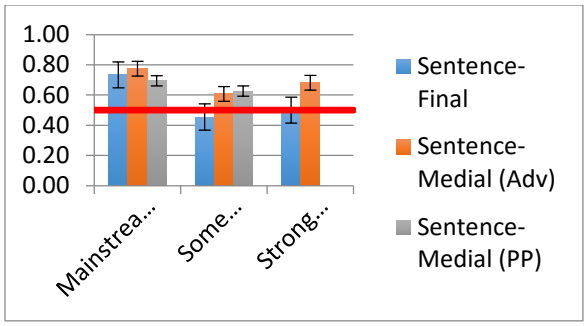


Fig. 1: Singular Sensitivity by Condition and Variation Status

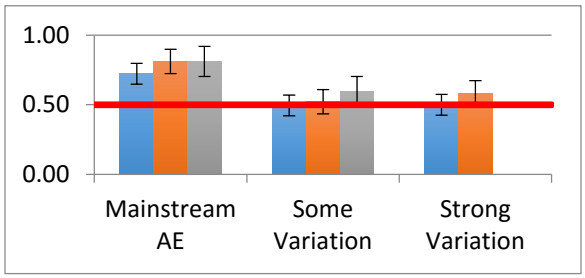


Fig. 2: Plural Sensitivity by Condition and Variation Status

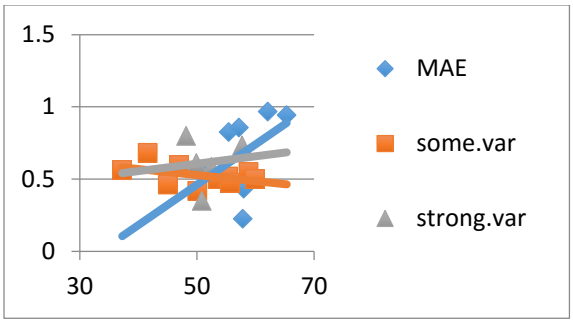


Fig. 3: Mean Sensitivity Score by Variation Status and Age (in number months)

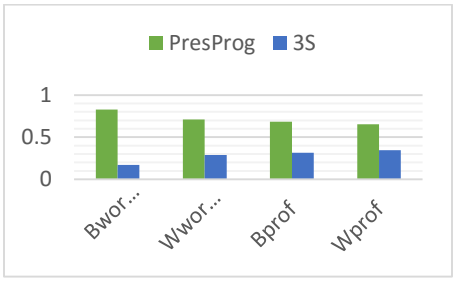


Fig. 4: Proportions of Singular Present Progressive in relation to 3rd Person Singular –*s* across users of different varieties

STUDY 2- CORPUS ANALYSES: Hall (1984) is the only CHILDES corpus that includes different varieties of American English used with children of the same age as our participants. Our analyses reveal similarities in the *frequency* of 3rd Person Singular –*s*: across speakers of different varieties, it occurs in less than 0.05% of utterances; and that –*s* occurs in all obligatory contexts across speakers and varieties but White and Black Working class corpora include much fewer obligatory contexts than White and Black Professionals. Secondly, we examined the hypothesis that the acquisition of 3rd Person Singular generic tense may not develop at the same speed in users of MAE and of other varieties given than non-MAE makes use of other devices (De Villiers & Johnson, 2007) (e.g. the progressive) to express the habitual (Kortman, 2013). Our results provide some evidence in favor of this hypothesis: a higher proportion of progressives (more than 80%) versus 3rd Person –*s* (less than 20%) is identified in Black Working Class than in speakers of other varieties (between 65 and 70% for the progressive versus 30 to 35% for 3rd Person –*s*) (fig.4). The analyses also reveal that while Auxiliary *do* is used as a habitual marker only by both Black Professionals and Working Class, irregular 3rd person *does* is used only by Black Professionals while Black Working Class use *do* in 3rd person Singular contexts (e.g. *if only **she** look**s** and **do**n't touch*). Finally only these two groups use –*s* with first person singular subject (e.g. ***I** say**s**, **I** pick**s** him up*) which may simultaneously strengthen the association between Singular Subject Agreement –*s* and weaken the relation between 3rd Person and –*s*.

The combined results of Studies 1 and 2 suggest that *input frequency* does not account for the acquisition of features subject to variation but *variation in the distribution of related constructions* might. Future investigations should a) examine the comprehension of related constructions (e.g. whether our results on users of different varieties correlate with differences in the interpretation of the progressive forms and Auxiliary *do*) and b) lead to the compilation of corpora that reflect the diverse varieties of English to which young New Yorkers are exposed.

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The logistic language learning curve?

Hezekiah Akiva Bacovcin & Christopher Ahern

Introduction: The logistic function, which has long served as the basic model of discrete language change (cf. Altmann et al. 1983; Kroch 1989), has both deep connections to change in biological populations as well as a practical implementation in terms of logistic regression. However, no particular cognitive mechanism has been proposed to underlie the logistic (Kroch 1989, 4). Yang's (2002) variational learning model offers a cognitive basis for change insofar as its mean dynamics yield *S*-shaped curves. Indeed, using simulations, we show that given sufficiently large datasets, it is possible to gain insight into whether the learning or logistic model generated an empirical S-shaped curve.

Background: The *variational learning* model of acquisition (Yang, 2002) consists of a finite set of parametrically varying grammars, a probability distribution over these grammars that the learner tracks, and an update rule that governs how learners change the distribution over grammars given input from the environment (cf. Bush and Mosteller (1955)). When presented with variable evidence, individual learners converge in expectation to a set of weights over grammars that reflects the relative evidence for grammars in the linguistic environment. In the case of two grammars, we can calculate the expected change, or mean dynamics, in the distribution over grammars in a population of learners over time as shown on the left where s is the selection coefficient in favor of one grammar over another (Ingason et al., 2013):

$$\dot{p} = p(1-p)\frac{s}{1-s(1-p)} \qquad \dot{p} = p(1-p)s \tag{1}$$

While the dynamics of the learning model on the left and the logistic on the right are distinct, it is not necessarily the case that they will in practice always be distinguishable. We simulate data under a range of parameters to determine when we can distinguish the two kinds of models.

Design: Based on a set of empirical case studies in the history of English (e.g. rise of "do" with "have" in American English, Zimmermann (2015)), we found an average selection coefficient (s) of approximately 0.03 (0.01-0.05), which corresponds to a change on the scale of 2-8 centuries. Using this selection coefficient (0.03), we simulated datasets varying the number of tokens in each simulation (randomly distributed across a 500 year span) with 200 simulations for each size. We selected the number of samples such that the average number of tokens per year ranged from 1 to 1024. For each simulation, we generated two sets of responses: (1) using the learning model and (2) using the logistic model. We then fit both models to each set of responses in each simulation (4 models per simulation) in order to determine if the models could distinguish between the different underlying data-generating mechanisms.

Results: To compare model discrimination at various sample sizes, we calculated the log-likelihood of each of the four models (two models for data generated by the learning model; two models for data generated by the logistic) fit for each simulation. We converted

the log-likelihoods into two signals, one for each data-generating mechanism. Each signal recorded which model's log-likelihood was higher. Using these signals, we calculated the KL-divergence statistic for each dataset size. The KL-divergence is given by the following equation, where the state t corresponds to the mechanism that actually generated the data and the signal m corresponds to observing which model had the higher log-likelihood given the data.

$$KL(m) = \sum_{t} P(t \mid m) log \left(\frac{P(t \mid m)}{P(t)} \right) \tag{2}$$

The KL divergence statistics for our simulations are given in Table 1 assuming no prior preference for either data-generating model, where higher scores indicate greater informativity regarding the data-generating mechanism.

Average number of tokens/year	KL (Learning Better)	KL (Logistic Better)
1	0.00	0.01
2	0.00	0.00
4	0.00	0.01
8	0.00	0.00
16	0.01	0.01
32	0.00	0.01
64	0.05	0.08
128	0.05	0.11
256	0.09	0.16
512	0.23	0.24
1024	0.42	0.42

Table 1: Simulation results with increasing sample sizes

Conclusion: We have demonstrated that it is possible to gain information about the underlying processes that lead to historical change. In particular, with plausibly sized datasets that have an average of 500–1000 tokens per year (e.g. COHA, Davies (2010-)), the results of comparing the fit of the learning and logistic models is informative about the underlying model that generates change. In our presentation, we will demonstrate how to fit these models to empirical datasets using R (R Core Team, 2015) and review our simulations and results.

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Mathematical modeling of grammatical diversity supports the historical reality of formal syntax

A. Ceolin[A], G. Longobardi[B,C], L. Bortolussi[B], C. Guardiano[D], M. A. Irimia[C], D. Michelioudakis[C], N. Radkevich[C], A. Sgarro[B]

[A] University of Pennsylvania
[B] Università di Trieste
[C] University of York
[D] Università di Modena e Reggio Emilia

The Classical Comparative Method has proven to be the only statistically uncontroversial method to study genealogical relationships between languages. However, the fact that the method can no longer be applied when phonetic correspondences are obscured by several thousands of years of language change has inspired the search for alternative methods for long-range comparison.

Longobardi and Guardiano (2009) show that another domain, syntax, is a potential source for cross-family comparison. The Parametric Comparison Method (PCM) uses syntactic parameters (Chomsky 1981, Baker 2001) to study relationships between languages. Parameters are coded as discrete binary values (+ or -). Additionally, the PCM allows for parametric implications, whereby a combination of values for some parameters can allow other parameters to take on only one value. The 'forced' or implied parameter in these cases is given the value 0 (undefined).

A question raised by the PCM framework is whether the results are secure against chance similarities between languages. Bortolussi et al. (2011) attempted to answer this question by using a randomly simulated distribution of parametric distances between languages (which are defined to range between 0 and 1) to perform statistical tests of the hypothesis that the distances observed in the real world are unlikely to arise by chance.

Here we evaluate the statistical significance of the results of PCM. We propose a refinement to Bortolussi et al.'s algorithm to better take into account the linguistic assumptions on syntactic parameters. After we generate a sample of 5000 artificial languages and calculate Jaccard distances among them, we compare the results with distances drawn from a database of 40 languages coded through 75 syntactic parameters (24 Indo-European, 3 Finno-Ugric, 2 Semitic, 2 Altaic, 2 Sinitic, 2 Basque and some isolated languages from Asia, Africa and South-America).

Figure 1 illustrates the difference between the distribution of actual language distances (green) and distances simulated by our algorithm (blue). We checked this difference with Mood's median test, which yielded an infinitesimally small p-value ($2.94 * 10^{-253}$), disconfirming the null hypothesis that the two distributions have equal medians. The difference remains ($p = 3.14 * 10^{-156}$), even after removing from the dataset language pairs that are both drawn from the same family (red).

If this signal were attributable to universal factors, such as the third factor computational pressures, it would not correlate with geographic or anthropological divisions.

Figure 2 shows the proportion of language pairs in our dataset that fall below a critical threshold (defined as the 10^3 quantile of the random distribution of distances). A high

proportion of pairs is exhibited by pairs within the IndoEuropean family. Almost all the missing pairs include an Iranian language (Farsi or Pashto), showing that this sub-family is the one which exhibits the highest distances with other IE languages.
Interestingly, all the pairs between Finno-Ugric (Finnish, Hungarian and Estonian) and Altaic (Turkish and Buryat) languages are below the threshold. While evidence for an Eurasiatic or Nostratic hypothesis is weak, the data seem to suggest the plausibility of a Ural/Altaic cluster. This finding requires further investigation.
These results confirm that syntactic parameters can provide novel information for the study of the prehistory of human languages, and hint at the possibility of aiming toward a greater time depth, given that parameters are part of a universal faculty of language.

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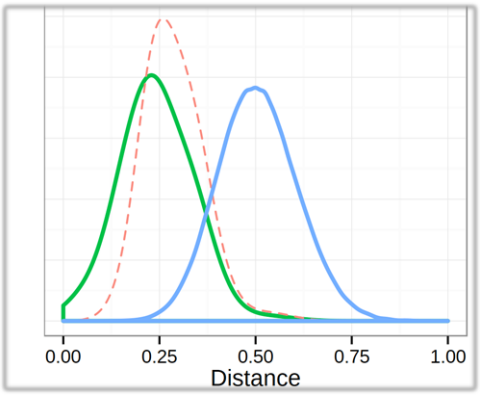

Fig.1

Class	Table Column Head		
	Total Pairs	*Below Threshold*	*Percentage*
IE	276	205	74.3%
IE/Finno-Ugic	72	23	31.9%
IE/Altaic	48	4	8.3%
IE/Basque	48	12	25.0%
IE/Semitic	48	6	12.5%
IE/Inuktitut	24	2	8.3%
Finno-Ugric/Altaic	6	6	100%

Fig.2

An Experimental Approach to the Syntax of "*have yet to*" Constructions

Greg Johnson -- gjohn52@lsu.edu -- Louisiana State University
Kali Morris -- bybelkal@msu.edu -- Michigan State University

Introduction: Harves & Myler (2014) analyze *have yet to* (HYT) constructions as being composed of perfect auxiliary *have*. On the other hand, Bybel & Johnson (2014) argue that HYT constructions are composed of main verb obligation *have* which is commonly assumed to select for an infinitival complement. In this talk we present behavioral data gathered from 108 college subjects, which bears on the syntactic category of *have* in HYT constructions. The data show that HYT constructions as judged by our subjects are not consistent with either a main verb *have* analysis or an auxiliary *have* analysis. Instead we argue that *have* in HYT is a vestigial V → T raising verb in English which is likely related to obligational *have*.

The Puzzle: The data in (1) raises the following question: Given that the perfect auxiliary is unable to take a nonfinite complement, what is the syntactic category of *have* in (1)?

(1) John has yet to eat.

Harves & Myler (2014) propose a solution that argues *have* is the perfect auxiliary and *yet* is licensed by a FAILED-TO predicate that is rendered silent by the movement of yet to the predicate's specifier, similar to neg-deletion in negative concord languages. However, Bybel & Johnson (2014) note that the proposed silent FAILED predicate contained in HYT unexpectedly resists adverbial modification (2) and VP coordination (3). Furthermore, (4) is acceptable, raising doubts about the status of *have* as the perfect auxiliary.

(2) a. John has completely failed to eat yet.
b. *John has completely yet to eat.

(3) a. John has neither [VP failed to excite us yet] nor [VP bore us to death].
b. *John has neither [VP yet to excite us] nor [bore us to death].

(4) John had had yet to make a decision before he left.

The acceptability judgements reported in Harves & Myler (2014) are complicated and the authors argue that the wide variation between and within their 12 speakers is the result of the presence of multiple grammars. We suggest that the inconsistent grammatical judgments coupled with the counterexamples provided by Bybel & Johnson (2014) motivate a re-evaluation not only of the syntax of HYT but also the diagnostics surrounding Harves & Myler's study.

Experimental Design: We employed an acceptability judgment task, taken as an online survey via Qualtrics. Participants, undergraduate students at a large Southern university, were asked to rate each sentence on a scale of 1-5 (1 = unacceptable; 5 = acceptable). Each participant was sorted into one of two conditions: (i) a main verb condition, meant to test the hypothesis that the *have* in HYT occupies a verb position and (ii) an auxiliary *have* condition, meant to test the hypothesis that the *have* in HYT occupies the T position. Both conditions were composed of 30 experimental sentences testing the syntactic position of *have* (10 HYT questions formed via either do-support or subject-auxiliary inversion, 10 HYT sentences containing *do*-ellipsis, and 10

HYT sentences containing *have*-ellipsis.) and 60 control sentences (30 grammatical and 30 ungrammatical) for a total of 90 items per condition. Speakers who rated questions formed via *do*-support as acceptable should rate *do*-ellipsis sentences favorably, while speakers who rated questions formed via subject-auxiliary inversion as acceptable should rate *have*-ellipsis sentences favorably.

Results: Participant ratings of HYT questions formed via *do*-support, as in (5a), patterned with their judgement of the ungrammatical controls. Participants in the auxiliary *have* condition rated HYT questions formed via subject-auxiliary inversion, as in (5b) more favorably than they did ungrammatical controls but still far below grammatical controls..

(5) a. Does John have yet to leave?
b. Has John yet to leave?

In the main verb condition, speakers preferred *have*-ellipsis over *do*-ellipsis, consistent with their rejection of the questions formed via *do*-support. Interestingly, although preliminary statistical analyses indicate a significant preference for *have* ellipsis over both *do* ellipsis and ungrammatical controls, these participants did not rate *have* ellipsis as acceptable as the grammatical controls. When compared to ungrammatical controls, participants found questions formed via subject-auxiliary inversion acceptable. As expected, these speakers preferred *have* ellipsis over *do* ellipsis.

Discussion: While the data trends reported here are consistent with the analysis presented in Harves & Myler (2014), the counterexamples are not. The trends in the data are also consistent with a V → T vestigial raising analysis of *have*, thus we propose an alternative solution that is both consistent with the data and consistent with the counterexamples shown above. We argue that the *have* in HYT is just such a raising verb, related to obligational *have*. It's raising verb status explains both its ability to co-occur with the perfect auxiliary (4) and the rejection of questions formed via do-support. This analysis would also be consistent with the unacceptability of *have*-ellipsis sentences if speakers are unable to coordinate auxiliary *have* and V → T raising *have*. Crucially, an auxiliary *have* analysis of HYT constructions can not explain the ellipsis facts alone.

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Jim Wood and Matthew Tyler (Yale University)

Micro-Variation in the *Have Yet To* Construction

Overview We present novel data to show that although the *have yet to* (HYT) construction (1) exists in all varieties of English, speakers' grammars vary in terms of the underlying syntax that derives it.

(1) John **has yet to** visit his grandmother.

Our primary focus is on whether *have* is analyzed as a main verb or an auxiliary; for many speakers, it can be either, with no difference in interpretation. This discovery forces a new analysis of the syntax of HYT, one which will be supported by novel data from closely related *yet to* constructions. The result is a fully compositional analysis of an otherwise puzzling, ostensibly *sui generis* construction.

Background Since Kelly's (2008) snippet, at least three detailed analyses of HYT have been proposed: Kelly 2012, Harves & Myler 2014, and Bybel & Johnson 2014. What is striking is that although they share many theoretical assumptions, they end up with very different analyses based on different judgments of the crucial data points. For Kelly 2012, HYT involves auxiliary *have* (aux-*have*) and sentential negation; for Harves & Myler 2014, HYT involves aux-*have* and no sentential negation; for Bybel & Johnson 2014, HYT involves main verb *have* (main-*have*) and sentential negation. We will resolve this tension by showing that (i) there is genuine speaker variation regarding the main-*have*/aux-*have* question (with an interesting twist), and (ii) syntactic negation is only present in the embedded clause, which correctly predicts mixed results on negation tests.

Proposal We propose that a matrix main verb selects for a negative C (cf. Landau 2002), which is responsible for licensing the NPI *yet* and the mixed results on negation tests (see below). Following the spirit of Kelly 2012, this *yet* has temporal features which must be valued as [PERF]. Departing from Kelly 2012, the temporal features can be introduced either by the main verb selecting for the negative C, or by a higher head in that verb's extended projection. If a speaker allows the former, then *have* will be a main verb; if the latter, *have* will be an auxiliary, and the main verb will usually be null. A schematic overview of the analysis is presented in (2) below. (Note: we adopt Wurmbrand's (2012) "Reverse Agree" analysis of temporal features, and assume with Harves & Myler 2014 that *yet* moves to a spec-head configuration with its licensor.) (We set aside *be yet to* here, but will discuss it in the talk.)

(2) a. $[_{TP}$ *John* $[_{PerfP}$ *has*$_{[iT:PERF]}$ $[_{vP}$ v^0(=Ø) $[_{CP}$ *yet*$_i$ C_{NEG} *to visit his grandmother* t_i]]]]

b. $[_{TP}$ *John* $[_{PerfP}$ $Perf^0$(=Ø) $[_{vP}$ *has*$_{[iT:PERF]}$ $[_{CP}$ *yet*$_i$ C_{NEG} *to visit his grandmother* t_i]]]]

In essence, we agree with Harves & Myler 2014 that aux-*have* derivations involve a null main verb, and with Bybel & Johnson 2014 that main-*have* derivations, with raising verb syntax, are possible as well. The difference is that for us, the silent main verb of (2a) is pronounced as *have* whenever it introduces the [PERF] feature. We now present evidence for the crucial aspects of this proposal.

Main vs. Aux-*have* In a recent survey, we asked for acceptability judgments for the sentences in (3).

(3) a. Oh, she has yet to finish, {has/does} she? b. What {have you / do you have} yet to eat?

c. {Has John / Does John have} yet to win… d. {Hasn't John / Doesn't John have} yet to…

Acceptance of the *do*-support variant implies that a speaker treats *have* as a main verb; acceptance of the *have*-raising variant implies that a speaker treats *have* as an auxiliary. In (4), we cross-tabulate the maximum ratings speakers gave to *do*-support and aux-*have* sentences. (The survey was administered on Mechanical Turk (Sprouse 2011); the results below include only participants who passed control sentences to ensure that they understood the task; more details will be given in the talk.) We see in (4) that 48% of participants accepted both aux-*have* and *do*-support sentences. Moreover, we find a striking implicational relation between them: almost everyone who accepts *do*-support also accepts aux-*have*, but a good number of participants (15%; 42/281) accept aux-*have* while rejecting

(4) Max Rating

	Aux Have							
Do-support	Bad		Marginal		Good		Total	
Bad	9	3%	20	7%	42	15%	71	25%
Marginal	6	2%	13	5%	42	15%	61	22%
Good	3	1%	10	4%	136	48%	149	53%
Total	18	6%	43	15%	220	78%	281	

all examples of *do*-support. This result tells us two things. First, the semantics of HYT cannot rely on the presence of aux-*have*; second, main-*have* must somehow be the "marked" variant, not available to everyone. **Our analysis captures this asymmetry**: all speakers of English have access to the general Perf^0-head that may introduce an interpretable [*i*T:PERF] feature (or take a default, Ø value; cf. Cinque 1999); the ability to introduce [*i*T:PERF] on a main verb—even it is just a "light" little v—requires something extra. Our analysis is thus quite similar to the analysis of 'perfect doubling' in Koeneman et al. (2011); they show that 'perfect doubling' in Dutch really involves a lexical 'have' selecting for a perfect participle in adjectival form. The analysis also accounts for the behavior of the—until now undocumented—group speakers who allow *have got yet to*, as in (5a). For these speakers, the otherwise null v in (2a) may be spelled out as *got*. Finally, the account correctly predicts that speakers will be able to introduce the [*i*T:PERF] feature on both the main verb and in Perf^0, as in (5b).

(5) a. We've got yet to visit our grandmother. b. He has had yet to pay me for 29 years now.

The position of *yet* The fact that *yet* follows *have* in *do*-support cases, and in the sentences in (5), suggests that *yet* is not high in the structure (as in Harves & Myler's and Kelly's proposals), but below the matrix main verb, as in Bybel & Johnson's proposal. Moreover, note that *yet* survives in the absence of a higher predicate, as in the small clause in (6).

(6) With the bride yet to arrive, the wedding was about to fall apart.

We also find evidence, from the sentences in (7) that *yet* must precede a complementizer:

(7) a. John has **yet for anyone to** openly oppose him.
b. I have **yet for this battery to** last longer than a couple of hours.

These sentences, which have not been noticed in previous work, have an 'experiencer *have*' reading, a reading that arises configurationally when a lexically empty light verb takes an external argument (Ritter & Rosen 1997, Myler 2014); this supports the proposal that a main verb must be present.

The complementizer's NEG feature. The presence of a [NEG] feature in the lower clause, rather than the matrix clause, also explains some of the variation found in the literature and in our surveys. Respondents generally judged sentences like those in (8a) to be quite bad, but sentences such as (8b-c), were judged to be much better. Whence the discrepancy?

(8) a. Jordan has yet to read it, I don't think. (Accept: 19%, Marginal: 18%, **Reject: 63%**)
b. Jordan has yet to visit Grandpa, not even once. (**Accept: 79%**, Marginal: 10%, Reject: 11%)
c. Jordan has yet to read it, and neither has Pat. (**Accept: 61%,** Marginal: 18%, Reject, 20%)

We suggest that the discrepancy follows from how the tests work. *Not even* must attach to a clause with syntactic negation, but that is easily satisfied by the embedded CP in (2). Similarly, *neither*-inversion requires only a syntactically negated verb phrase; the understood ellipsis in (8c) is *neither has Pat* <*READ IT*>, and <*READ IT*> falls under the scope of the embedded negative C as well. It is only the negative slifting example in (8a) that truly must attach to a negative matrix clause. Since the matrix clause in HYT is (for most speakers, we argue) not negative, (8a) is generally rejected.

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Microvariation in American English Applicative Structures

Jim Wood and Raffaella Zanuttini (Yale University)

Overview In this talk, we discuss implicational relationships among speaker judgments in the realm of dative constructions in American English. We analyze these relationships as arising from micro-variation in the properties of functional heads, including a special kind of Applicative head as well as the elements involved in building "presentative" sentences. More broadly, we show how this approach provides the formal means to capture fine-grained, one-way implications in acceptability judgments across speakers.

Dative Constructions in American English *Personal Datives* are obligatorily co-referential with the subject, despite the fact that they lack reflexive morphology. They are exemplified by the following sentences:

(1) a. We had *us* a cabin… (Christian 1991)
b. I love *me* some baked beans. (Webelhuth & Dannenberg 2006)
c. I'm gonna write *me* a letter to the President. (Conroy 2007)

Hutchinson and Armstrong 2014 argue that the dative pronoun is introduced by a low Appl head, which relates a DP complement to its DP specifier. This is similar to the Appl head we find in double object constructions (Pylkkänen 2002), but with a special flavor: Appl_{SAT} (for *satisfactive*) introduces a relation of satisfaction between the subject and the event denoted by the predicate.

(2) $[\![\text{Appl}_{\text{SAT}}]\!] = \lambda x_e \lambda y_e \lambda P_{\langle e,st\rangle} \lambda e_s.\, P(e,x)$ & THEME(e,x) : MATTERS-TO(x,y) & SATISFIED-THROUGH(e,y)

Presentative Datives occur in sentences with the function of pointing out the presence of an entity to a 'presentee' (Wood et al. 2015):

(3) a. Here's *you* a piece of pizza. b. Here's me a good pair of jeans.
c. Here's *us* a gas station—pull over!

Though all speakers of English accept a presentative like *Here's some money <u>for you</u>*, not all speakers of English accept the sentences with a dative in (1) or (3). The latter constructions are widely accepted in the South of the United States. We will present survey data showing that the speakers who accept sentences like (3) also accept the ones with a personal dative, as in (1), but not vice versa. How exactly do we capture the difference among the grammars of speakers who (a) do not accept personal datives, (b) accept only personal datives, (c) accept both personal datives and datives in presentative sentences?

Presentative Structures We assume that the *here* of presentative constructions is syntactically distinct from ordinary locative *here*. This is supported by the fact that many languages use a special "presentative" particle that does not have an independent locative function. An example of this from Italian is presented in (4) (see Zanuttini 2016 and references therein for detailed discussion):

(4) a. Ecco-ti le chiavi.
ECCO-you the keys
'Here's you the keys.'
b. *Gianni è ecco.
Gianni is ECCO
INTENDED: 'Gianni is here.'

Even in English, presentative structures have special properties; they are indexical not only to speech location, but also to speech time, as illustrated by the following contrast:

(5) a. The pizza is (usually) here.
b. Here's {*usually} the pizza {*usually}.

In (5a), the predication *[$_{SC}$ the pizza here]* can be indexed to generic present tense. Since it needn't refer to the speech time, modifiers like *usually* are fully acceptable. In (5b), we have the same predication—note that (5b) entails that the pizza is in the denoted location. However, this

same predication, in (5b), cannot be indexed to the generic present tense. It necessarily refers to the speech time, so modifiers like *usually* are ungrammatical. Wood & Zanuttini (2016) propose that in presentatives, *here* moves to a left-peripheral C_L projection that indexes the speech location, and is selected by the hearer-oriented "ostensive Speech Act" head (SA_h) discussed by Hill (2014:161–169). The structure of *Here's a pizza* is thus (6):

(6) $[_{SAhP}\ SA_h\ [_{CLP}\ [_{XP}\ \textit{here}\ ]\ \ldots\ [_{SC}\ [_{DP}\ \textit{a pizza}\ ]\ \langle XP\rangle\ ]]]$ (Presentative)

What is important is that the raising of *here* is obligatory for the presentative interpretation to obtain. We are now in a position to show how the Presentative Datives in (3) are derived.

Applied Datives in Presentative Structures Drawing on the correlation mentioned above, we propose that Presentative Datives involve the same $Appl_{SAT}$ head as Personal Datives. In Presentative Datives, $Appl_{SAT}$ takes a small clause rather than a DP as a complement:

(7) $[_{ApplP}\ \textit{you}\ [_{Appl'}\ Appl_{SAT}\ [_{SC}\ [_{DP}\ \textit{a pizza}\ ]\ [_{XP}\ \textit{here}\ ]]]]$

However, $Appl_{SAT}$ cannot always take a small clause as a complement. This is because the semantics of $Appl_{SAT}$ (cf. (2)) force it to combine with an entity-denoting constituent. The reason why $Appl_{SAT}$ can take a small clause complement in presentatives (cf. (7)) is that they force the predicate (*here*) to raise to a higher position in the clause, as discussed in (6):

(8) $[_{CLP}\ [_{XP}\ \textit{here}\ ]\ \ldots\ [_{ApplP}\ \textit{you}\ [_{Appl'}\ Appl_{SAT}\ [_{SC}\ [_{DP}\ \textit{a pizza}\ ]\ \langle XP\rangle\ ]]]]$ (Presentative dative)

Following Chomsky (2013), this raising effectively turns the complement of $Appl_{SAT}$ into a DP for the purposes of labelling. Moreover, if we assume that only the higher copy of *here* is interpreted, then the complement of $Appl_{SAT}$ is semantically an entity as well. The structure then converges semantically with no further stipulation: $Appl_{SAT}$ will first combine with *a pizza*, then with the dative in its specifier, and will return a constituent looking to combine with a predicate of type $\langle e,\langle s,t\rangle\rangle$, which is exactly the semantic type of the predicate *here*.

Speaker Variation We can account for speaker variation in terms of the features associated with Appl heads. All English speakers have the basic low Appl head. But only a subset of English speakers have $Appl_{SAT}$ in their grammar; those who do will allow Personal Datives. While all speakers who have $Appl_{SAT}$ allow it in the low position, where it combines with a DP, only a subset of the speakers who have $Appl_{SAT}$ allow it in a higher position, where it combines with a small clause. We take this fact to follow from two considerations:

(i) The low Appl position is the unmarked position for Appl in English, so specific subcategories of Appl (such as $Appl_{SAT}$) will generally be allowed in that position.
(ii) Semantically, $Appl_{SAT}$ combines with two entity-denoting arguments (cf. (2)), so the low (as opposed to the high) position will be its unmarked position.

In general, we suggest that understanding microvariation as variation in the formal properties of functional heads allows us the formal precision needed for discrete grammars, the flexibility needed to capture small differences, and the power to capture strong implicational tendencies across distinct grammars.

The Innovation of an Animacy Condition: Conditioning Environments for Dative Shift

Hezekiah Akiva Bacovcin

Introduction: Multiple studies on English Dative Alternation (see Table 1) have shown that in modern English it is conditioned by a number of information theoretic, semantic and prosodic factors (Collins, 1995; Bresnan et al., 2007; Bresnan and Nikitina, 2009). This paper extends those results in two new directions. First, the conditioning factors for the interaction between the dative alternation and passivization are explored. Secondly, we reveal diachronic shift in those conditioning factors during the history of American English.

Active	Passive
She gave the recipient the theme.	The recipient was given the theme.
She gave the theme to the recipient.	The theme was given to the recipient.

Table 1: Examples of active and passive dative alternation

Data Collection and Coding: For this paper, we focus on the order of the two ditransitive objects with the verb 'give' and 'offer' (the two most common ditransitive verbs in Modern English as determined using Kroch et al. (2010)). We started by extracting all sentences containing 'give' and 'offer' from the Corpus of Historical American English (Davies, 2010-). A randomly selected subset of sentences were hand coded for: the full noun phrase versus pronominal status of the recipient and theme, voice, and object order. Replicating Bresnan and Nikitina (2009), clauses with pronominal arguments showed little word order variation in modern American English. Therefore, a further 730 tokens with full noun phrase theme and recipient were given more in-depth coding for number of recipient and theme, definiteness of recipient and theme, animacy of recipient and theme, and difference in number of orthographic words between theme and recipient. The 730 tokens were selected with the distribution shown in Table 2 in order to study difference between active and passive tokens as well as the early and late periods of American English.

		Active	Passive
1819–1870	give	100	76
	offer	95	90
1980–2009	give	100	84
	offer	94	91

Table 2: Distribution of in-depth coding tokens

Results: All of the results were examined using logistic regression fit using R (R Core Team, 2013). Using AIC as a selection criterion, the optimal logistic model for the in-depth coded data included the following main effects: period, size difference between objects, definiteness of both objects, animacy of the recipient, voice, recipient number.

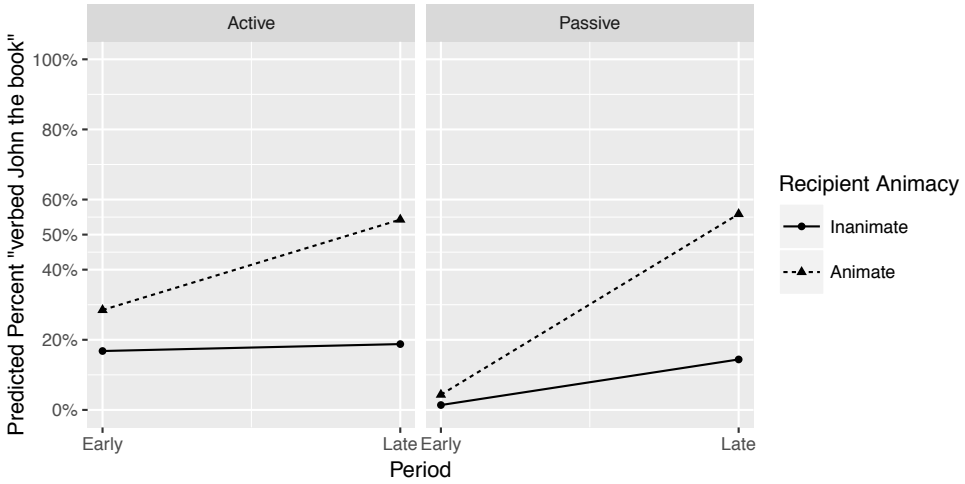

Figure 1: Mean predicted rates of recipient–theme use in different conditions for equally sized definite objects

Figure 1 shows recipient animacy came to play a large role in promoting recipient–theme word orders in modern American English. A model fit to only the Early data showed that animacy was not a significant factor in this period (p=0.39), however there was a significant interaction between period and animacy in the full model. This change in conditioning occurred in both active and passive clauses, with the end result of the change being equal rates of recipient–theme orders in active and passive clauses, unlike in early American English, where theme–recipient orders dominated the passive.

Conclusions: These results replicated previous findings about conditioning factors for ditransitives in modern English. They also show that these conditioning factors can be introduced to a language, as suggested by the emerging effect of recipient animacy across the history of American English. Finally, they show that passive ditransitives are subject to similar conditioning factors in word order choice as active ditransitives, with the caveat that some grammars seem to disprefer recipient–theme orders in passives.

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