CCLAS

Chisasibi
Child Language
Acquisition Study

Grammar Matters: Evidence from Metrical and Inflectional Development in Northern East Cree

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Context

- Competing linguistic theories can offer radically different outlooks on the nature of linguistic systems
- These views have implications for theories of language acquisition
- Today's aim:
  Testing some of the different predictions made by these models

Grammatical (generative) approach

- Acquisition as grammatical generalization
- Driving factor: grammatical transparency
  - Basic/transparent units acquired first
  - Abstract properties acquired progressively
  - Idiosyncrasies must be memorized
  - Frequency: a potential influence, but does not drive the developmental sequence
- Potential (over-)generalizations of the most transparent aspects of the system during the developmental period

Constructivist (exemplarist) approach

- Acquisition from stacking of events in memory
  - "Storage is processing" (Bybee 2001)
  - Every used form (in perception or production) leaves a trace in the lexicon
  - No generalizations beyond semantic and/or phonological similarity (analogy)
- Repetition/frequency = determining
  - Early word productions reflect salient/frequent properties of the memorized forms
  - Low-level production issues may hinder initial pronunciations

Pitting the approaches

- The two approaches differ significantly with regard to the roles of frequency versus grammatical transparency
- We compare these approaches based on acquisition data from Northern East Cree
  - Key fact: some grammatically opaque/transparent properties of NE Cree do not correlate with low/high frequency figures
- THM: Grammatically transparent properties are the first to systematically manifest themselves in our production data, in spite of input frequency

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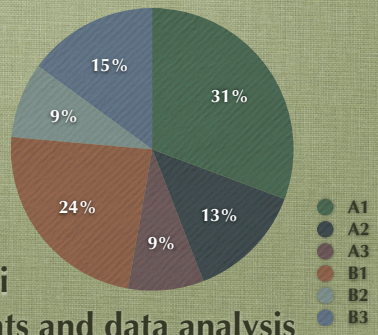
- 127 videos made over 30 month period (2004-07)
- In 2004:
  - Cohort A ≈ 2 y.o.
  - Cohort B ≈ 4 y.o.



- Current case study:
  - Child code-named Ani
  - Acoustic measurements and data analysis at ages 2;02, 2;08, 3;04, 3;06 and 4;01

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Ani's metrical development

- Properties of (adult) NE Cree
- Developmental data
- Interim discussion

NE Cree metrical system

- NE Cree displays an abstract stress system whose analysis poses its own challenges (e.g. Dyck et al. 2006; Wood 2006; Swain 2009)
- General properties:
  - Basic foot: Iamb (weak-STRONG)
  - Rightmost 'stressable' syllable receives stress
    - Stress falls on either of the last 3 syllables in long words, depending on syllable weight
  - Final extrametricality (suppressed in case it yields sub-minimal or unstressable words; e.g. one-σ words)
  - Some idiosyncratic stress patterns

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NE Cree's pitch accent system

- One pitch accent per word
- Two patterns

Non-final		Final	
Default pattern for words in isolation and in context		Morphologically conditioned	
ˈchî.mân [ˈtʃiːmaːn]	*boat*	chî.ˈmân-H [tʃiːˈmaːnʰ]	*boats (pl. suffix)*
ˈnuh.kum [ˈnʊhkʊm]	*my grand-mother*	ûh.ˈkum-H [uːhˈkʊmʰ]	*someone's grandmother (obv. suffix)*

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Ani: Word-final stress

(1)

- Word-final stress mastered early on
- Percentage of accuracy in words with final stress

Age	Attempts	Errors	Target-like stress
2;02.02	14	1	92,9
2;08.28	47	0	100%
3;04.09	14	0	100%
3;06.23	16	0	100%
4;01.30	32	0	100%

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Ani: Penultimate Stress

(2)

- Accuracy rate = much lower
- Error pattern: almost-systematic stress displacement to the final syllable

Age	Attempts	Errors	Target-like stress	Stress shift to final σ
2;02.02	24	9	62,5%	9/9
2;08.28	35	14	60%	14/14
3;04.09	41	19	53,7%	17/17
3;06.23	33	11	66,7%	10/10
4;01.30	39	6	84,6%	6/6

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Ani: Antepenultimate Stress

(3)

- Accuracy rate: initially very low
- Same error pattern: almost-systematic stress displacement to the final syllable

Age	Attempts	Errors	Target-like stress	Stress shift to final σ
2;02.02	7	6	14,3%	6/6
2;08.28	12	6	50%	7/7
3;04.09	16	12	25%	12/12
3;06.23	32	5	84,4%	4/5
4;01.30	12	3	75%	3/3

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Interim discussion

- Over-application of final stress suggests early acquisition of the most basic properties of the target stress system
  - Foot form = Iamb; End rule = Right
- Gradual acquisition of extrametricality
  - This opaque parameter is acquired on a word-by-word basis
    - No antepenultimate-to-penult stress shift suggests no over-generalization of the (opaque) parameter
    - Obscuring factors: syllable weight, morphology

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Ani's morpho-syntactic development

- Properties of (adult) NE Cree
- Developmental data
- Interim discussion

Animate Intransitive (AI) verbs

(4)

- Cree verbs are traditionally classified along lines of transitivity and animacy, intransitive subjects, transitive objects
- AI verbs are the most frequently occurring verb type in the 10 sessions (and in target language, 41% for NE Cree)
- We consider two of the three verbal inflectional "orders", Independent, Conjunct, and Imperative

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Independent versus Conjunct

	Independent	Conjunct
Syntax	• Attested in main clause contexts • 'Elsewhere' (default) inflection (Brittain 2001)	Required in: • Subordinate clauses • Wh-clauses • Focus constructions
Morph'y	• Less fusional (more transparent)	(5) • More fusional • Initial change (IC)

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Input frequency: Independent versus Conjunct

- (Woods) Cree, inflection types in main clauses (Starks 1994)

  [Recall: Conjunct is required in subordinate clauses]

	Conversation		Narrative	
	#	%	#	%
Independent	89	45	11	23
Conjunct	95	48	35	75
Imperative	14	7	1	2

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Predictions from frequency

- Overall, Conjunct is the most frequent order used in adult Cree
  - Given general observations about child-directed speech, the frequencies seem roughly equivalent [...study in progress...]
- Usage-based approaches predict the early emergence of the Conjunct over the Independent order
  - Or, minimally, parallel development
- This prediction is not supported by the data

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Developmental evidence

- Favouring the Independent:
  - Grammatically transparent
- Innovative inflection of 'child' verbs
  - Child verbs: rarely/inconsistently inflected in the input, if inflected at all
  - From age 3;04, Ani inflects child verbs
- Overall drop in performance (at 3;04):
  - Coincides with the onset of productive inflection, suggesting a move from use of stored amalgams to creative use of rules

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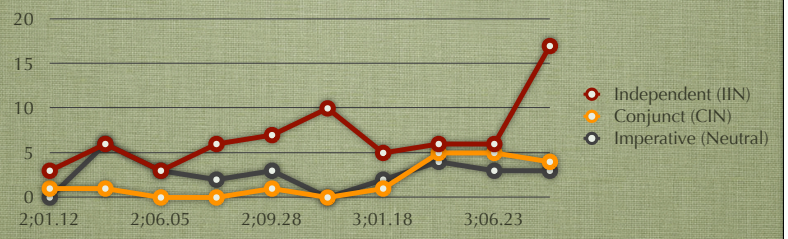
Ani's verbal productions



- Predominance of Independent forms
- At around 3;04:
  - Emergence of productive inflection
  - Dip in overall performance

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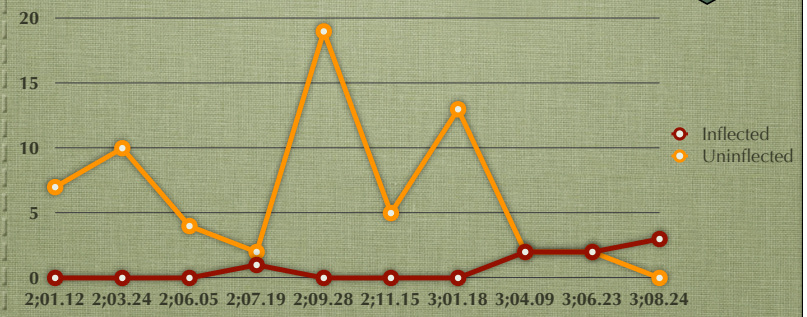
Verbal productions: numbers

- Between 2;01 and 3;01
  - 67% of Ani's attempted verbs are Independent
  - 7% are Conjunct
- Between 3;04 and 3;08
  - 55% of Ani's attempted verbs are Independent
  - 26% are Conjunct
- These numbers run counter to expectations if input frequency is a significant force in the acquisition of these forms

Ani's child forms

(6)



- Virtually no inflection of child forms until 3;04
- Spontaneous appearance of inflections
- Suggests grammatical over-generalization

≈ 3;04: A drop in performance

- As Ani begins to inflect child forms, she starts making errors on forms previously produced close to target
- Focus: 1st person (Independent) forms, which require prefix and suffix
  - Gradual emergence of the prefix; performance drop at 3;04
  - Suffix: performance decreases at 3;04

(7)

Interim discussion

- Prior to 3;04, Ani began to generalize her use of the language's default inflectional system

(8)

  - Default order easier to interpret, acquired faster (despite input frequency)
- At around 3;04: emergence of a productive grammatical system
  - Grammatical innovation (inflected child forms)
  - Dip in performance on produced inflections
    - Both prefixes and suffixes are affected

Discussion

- We cannot build a receptive lexicon for polysynthetic languages without grammar
  - Single roots can yield thousands (potentially millions!) of forms (Hankamer 1989; Sadock 1980)
- This claim holds true of Cree
  - Most (NE) Cree words (80%) are verbs
  - Verbs encode varied and complex semantic (and, we assume, structural) relationships
- Form-meaning associations within the verb complex logically require some degree of decomposition into smaller units

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Discussion

- Our working hypothesis
  - Memorization of amalgams (unanalyzed chunks) involved in building an initial lexicon
  - Pre-3;04: implicit grammatical analysis during the amalgam-storing stage
    - Identification of basic (transparent) properties of the target grammar
  - 3;04 onward: onset of productive use of grammatical rules
    - Over-application 'errors'

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Discussion

- Initial productions are stress-driven
  - Segmentation driven by prosodic salience (Mithun 1989, Slobin 1985)
  - Ani's initial word forms: (W)S foot (Swain 2009)
    - Prefix deletion: falls outside the foot
    - Suffix production: part of the foot
- Emergence of morphology enables larger-domain analysis
  - Gradual revisions of the lexicon incorporate units matching morphological analysis

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Discussion

- Memorization remains a significant component of the story
  - Early generalizations arise from phonologically-conditioned, memorized amalgams

- Exemplar storage cannot be equated to grammatical processing

(contra Bybee's claim)

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Thanks!
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