Understudied and Endangered Languages at the Semantics/Syntax Interface

The Questions

The Question for This Session:
What have understudied/endangered languages (and their speakers) taught us?

My Sub-Question:
What have these languages taught us about the semantics/syntax interface?

History of Semantic Research on Understudied/Endangered Languages

Theoretically informed semantic research into understudied languages is **not** new...

Bach (1968)	Nuu-chah-nulth (Nootka)
Cooper (1975)	Hittite
Karttunen and Karttunen (1976)	Finnish
Johnson (1977)	Kikuyu
Gunji(1981)	Japanese
Stein (1981)	Thai
Gil (1982)	Tagalog, Georgian, Maricopa
Kang (1988)	Korean
Ojeda (1992)	Arabic
Dayal (1993)	Hindi

History of Semantic Research on Understudied/Endangered Languages

...but it has expanded dramatically since the publication of:

Bittner (1994)	Kalaallisut, Lakhota, Yoruba
Jelinek & Demers (1994)	Straits Salish (Lummi)
Bach et al. (1995)	Haisla, Mohawk, Kalaalisut, Warlpiri, Hindi, Mayali, Navajo, Georgian, Tagalog, Maricopa, Turkish, Straits Salish (Lummi), ASL, Asurini do Trocara
Matthewson (1998)	Lillooet Salish

Factors Behind Recent Expansion of 'Semantic Fieldwork'

- General Expanse of Formal Semantics
  - Following Heim & Kratzer (1998) and Chierchia & McConnell-Ginet (2000), semantics has become more widely taught, and thus more integrated into linguistics & cog-sci.

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- Critical Mass of Prior Work
  - Enough work now exists that there is a productive, identifiable paradigm for conducting 'semantic fieldwork' (Matthewson 2004).
- Fortunate Alignment Between Semantic Theory and Elicitation Tasks
  - Judgments of truth/felicity (relative to a context) are relatively easy to obtain.
  - Such judgments provide data directly relevant to truth-conditional semantic theory.

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- There are some areas of variation we hadn't expected
  - Indexical Shift (Schlenker 1999, Anand 2006)
  - Languages Violating Principle C (Davis et al. 2007)
  - Modals With Variable Strength (Rullmann et al. 2008, Deal 2011)

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  - Indexical Shift (Schlenker 1999, Anand 2006)
  - Languages Violating Principle C (Davis et al. 2007)
  - Modals With Variable Strength (Rullmann et al. 2008, Deal 2011)
- But, there are some areas of uniformity we hadn't expected
  - Lack of Quantificational Determiners (Matthewson 2001)
  - Lexical Categories (Theoretical Linguistics 35:1)
  - Evidentials as Modals (Matthewson 2010)
  - Tense(less) Languages (Matthewson 2006)

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Two General Themes of This Work:

- Linguistic theory advances linguistic documentation, as it prompts deeper empirical questions.
  - Evidentials (Matthewson et al. 2008, Matthewson 2010)
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  - Tense(less) Languages (Bittner 2005, Lin 2006, Matthewson 2006).
- Theoretically informed study of 'exotic' phenomena prompt reevaluation of long-held analyses of better-studied languages.
  - Coercion of Aktionsart (van Geenhoven 2004)
  - Quantificational DPs (Matthewson 2001)

Indexical Shift: Background

Indexical Expressions:

- Local Person Pronouns: ‘I’, ‘we’, ‘you’
- Certain Locatives: ‘here’, ‘there’
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‘Intensional Insensitivity’ (Kaplan 1977, Anand 2006):

‘I’ $\neq$ ‘the person speaking’

- Dave: “**The person speaking** is hungry!”
- Bill: “Dave said that **the person speaking** was hungry.”

- Dave: “**I** am hungry.”
- # Bill: “Dave said that **I** was hungry.”
- Bill: “Dave said that **he** was hungry.”

Indexical Shift: Background

Classic, Kaplanian Analysis, Part 1:

- Expressions are interpreted relative to a *context* **c** and an *index* <**w,t**>.
- The value of an *indexical* is determined by the **context**.

  $[\![\text{ I }]\!]^{\mathbf{c},w,t} =$ the speaker in **c**

- The value of a *non-indexical* is determined by the **index**.

  $[\![\text{ the person speaking }]\!]^{c,\mathbf{w,t}} =$
  the person speaking in **w** at **t**

Indexical Shift: Background

Classic, Kaplanian Analysis, Part 2:

Natural Language operators can only 'shift' the **index**, never the **context**.

$$[\![\text{ believes CP }]\!]^{\mathbf{c},w,t} =$$

[λx: for all $<$**w', t'**$>$ consistent with
the beliefs of x at w, t, $[\![\text{ CP }]\!]^{\mathbf{c, w', t'}} = \text{T}$]

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Let the context c be such that Bill is the speaker in c...

- $[\![$ Dave believes that I am hungry $]\!]^{\mathbf{c},w,t} =$ T iff
- for all <**w', t'**> consistent with the beliefs of Dave at w, t, $[\![$ I am hungry $]\!]^{\mathbf{c},w',t'} =$ T
- for all <**w', t'**> consistent with the beliefs of Dave at w, t, $[\![$ I $]\!]^{\mathbf{c},w',t'}$ is hungry at w' and t'.
- for all <**w', t'**> consistent with the beliefs of Dave at w, t, **the speaker in c** is hungry at w' and t'.
- for all <**w', t'**> consistent with the beliefs of Dave at w, t, **Bill** is hungry at w' and t'.

Indexical Shift: Background

Key Prediction: No 'Monsters' (Kaplan 1977)

No natural language will have intensional operators that allow the (morpho-syntactic) equivalent of

"Dave thinks that **I** am hungry."

spoken by (e.g.) Bill to mean

"Dave thinks that **Dave** is hungry."

Indexical Shift

Key Problem for Classic Account (Schlenker 2003, Anand 2006):
Here there be monsters!

- Amharic (Schlenker 2003, Anand 2006)
  john [jɨəgna n-**ññ**] yɨl-all
  John hero is-**1sS** says-3sS
  “John says that { I am / he is } a hero.”

- Navajo (Speas 1999, Anand 2006)
  Jáan [chid’ɨ naháłnii’] n’ɨ
  John car 3sO.**1sS**.buy 3sS.say
  “John says that { I / he } bought a car.”

- Zazaki (Anand & Nevins 2004, Anand 2006)
  hɛseni va kɛ **ɛz** dɛwletia
  Hesen.OBL said that **I** rich.PRES
  “Hesen said that { I am / he is } rich.”

Indexical Shift

A Natural Question:

"Wait! How Do We Know These Aren't Just Direct Quotes?"
(*cf.* Dave said "**I** am hungry.")

- Argument 1: Unlike direct quotes, extraction is possible from 'shifted' clauses.

  English: * What$_1$ did Dave say "I'm going to devour t_1."

  Navajo: (Speas 1999, Anand 2006):

  Háadilá$_1$ Kii Mary [t_1 d'ɨn'ɨlnish] yiłn'i.
  where Kii Mary **2sS**.work 3sIO.3sS.say
  "Where$_1$ did Kii say to Mary that **she** should work t_1?"

- Argument 2: Unlike direct quotes, matrix negation licenses NPIs in 'shifted clauses.

  English: * Dave **didn't** say "I have eaten **anything**."

  Zazaki: (Anand & Nevins 2004, Anand 2006):

  Rojda **ne** va kɛ **mɨ** **kes** paci kɛrd.
  Rojda **not** said that **I** **anything** kiss did.
  "Rojda **didn't** say that **she** kissed **anyone**."

A Constraint Governing Indexical Shift

Shift Together (Anand & Nevins 2004, Anand 2006)

All shiftable indexicals within an attitude context must pick up their reference from the same context parameter.

Illustration:

- Morpho-Syntactic Structure:

  DAVE TOLD MARY
  [THAT BILL TOLD SUE
  [THAT I LIKE YOU]].

- Possible Interpretations:
  - 'I' = utterance speaker; 'you' = utterance addresse
  - 'I' = Dave; 'you' = Mary
  - 'I' = Bill; 'you' = Sue
  - **...and no others** (* 'I' = Dave; 'you' = Sue)

Analysis of Indexical Shift (Anand 2006)

Analysis, Part 1:
Indices and contexts are the same "type" of object.

- Context: $<$ speaker, addressee, time, location, world $>$
- Index: $<$ speaker, addressee, time, location, world $>$

Analysis, Part 2:
Natural language has 'diagonalization' operators (Stalnaker 1978), which replace the 'context' with the 'index'.

$$[\![\text{OP}_{diag} \text{ CP }]\!]^{\textbf{context, index}} = [\![\text{CP }]\!]^{\textbf{index, index}}$$

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Broader Consequences:

- Diagonalization operators exist in natural language!
- A novel theory of long-distance reflexives (Anand 2006).
- A novel theory of *de se* attitudes (Anand 2006).

Modals and Quantificational Force

Properties of Modals in 'Standard Average European'

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- Lexically fixed quantificational force over possible worlds. (Kripke 1959)
  - "must" = universal; "may" = existential.
- Contextually supplied domain of quantification [modal base] (Kratzer 1977)
  - Epistemic Modals:
    Modal Base = Worlds Consistent with Knowledge
    "Dave must be here" =
    In all worlds consistent with our knowledge, Dave is here.
  - Deontic Modals:
    Modal Base = Worlds Satisfying 'The Most' Laws
    "Dave must go to jail" =
    In all the worlds satisfying the most laws, Dave goes to jail.
  - Circumstantial Modals:
    Modal Base = Worlds Like Actual World Up to Present
    "Dave may dance." =
    In some world just like the actual world up to the present, Dave dances.

Modals With Variable Force

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Phenomenon of Central Interest:

Languages where the *opposite* arrangement seems to hold:

- (Type of) Modal Base Lexically Fixed
- Quantificational Force (Strength) Determined by Context

Languages With This Alternate System:

- Lillooet Salish [St'át'imcets] (Rullmann et al. 2008)
- Gitksan (Peterson 2010)
- Nez Perce (Deal 2011)

The Modal System of Lillooet

Modal ‘Particles’ With Lexically Fixed Modal Base:

- Epistemic modal particle “k’a”

  Wa7 **k’a** qwenúxw.
  IMPF **EPIST** he.sick
  “He **must** / **might** be sick.” (Rullmann et al. 2008: 320)

- Deontic modal particle “ka”

  Kan **ka** kw-en-s ulhcw
  Q **DEON** DET-1sPOSS-NOM enter
  “**Should** / **may** I come in?” (Rullmann et al. 2008: 328)

- Circumstantial modal particle “kelh”

  Kakwisa **kelh** ti k’ét’ha
  fall **CIRCUM** DET rock.
  “That rock **might** / **will** drop.” (Rullmann et al. 2008: 326)

The Modal System of Lillooet

Strength of Modal Particles Varies with Context:

- Epistemic “k’a” as Weak / Existential Modal:

  K’a lhzúqwas tu7 ni7 na núkwa qelhmín
  EPIST die.3sS then DEM DET other old

  smúlhats **k’a** lhmím’cas tu7 nka7.
  woman **EPIST** move.3sS then where.

  “**Maybe** the other old woman died. **Maybe** she moved somewhere.” (Rullmann et al. 2008: 324)

- Epistemic “k’a” as Strong / Universal Modal:

  Kaq’ustum’á **k’a** wi7
  frightened.PASS **EPIST** him
  “It **must** have really frightened him!” (Rullmann et al. 2008: 323)

  [Context: Jim Hoffmann thought he saw a sasquatch and came running back with huge terrified eyes.]

Formal Analysis (Rullmann et al. 2008)

Central Hypotheses:

- Lillooet modal particles are always universal (strong)...
- But, the modal base is argument to a **function** that returns a subset...
- And it is this **function** that is contextually determined:
  - When the function is one that returns the **entire base**, we get the equivalent of a **'strong'** reading.
  - When the function is one that returns a **subset**, we get the equivalent of a **'weak'** reading.

Sketch of the Formal Semantics:

[[k'a CP]]$^{w,\mathbf{f}}$ = T iff

In **all** worlds w' in **f** ({ w' : w' is consistent with our knowledge in w }), [[CP]]$^{w'}$ = T.

An Interesting Consequence of the Analysis

A Possibility This Raises (Rullmann et al. 2008):

- Perhaps English modals actually have a similar semantics.
- The key difference between English and Lillooet: English has modals (*i.e.*, strong modals) that carry a presupposition that function **f** returns the entire base.

Sketch of the Formal Semantics

- [[may VP]]^{w,f,base} = T iff
  In **all** worlds w' in f(base): [[VP]]^{w} = T
- [[must VP]]^{w,f,base} = T iff
  In **all** worlds w' in f(base): [[VP]]^{w} = T
  Presupposition: for all bases b, f(b) = b.

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- This work has revealed areas of semantic variation that were completely unanticipated:
  - Indexical Shift
  - Modals with Contextually Variable Strength
- But other work has revealed areas of semantic uniformity that were rather unanticipated:
  - (Absense of) Quantificational Determiners
  - Lexical Categories
  - Tense Semantics

Understudied / Endangered Languages and Linguistic Theory

- The semantic diversity discussed here couldn't have been observed without a background theory of semantics.
  - It's only against a background modal semantics that the unique properties of Lillooet modals become apparent, as well as their deeper significance for our theory of English modals.

Understudied / Endangered Languages and Linguistic Theory

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- Investigation of understudied languages doesn't just inform our theory of cross-linguistic variation...
  - ... it also affects our analyses of more widely-studied languages.

Analyses of understudied languages
Forces change in:
Broader grammatical theory,
Which forces change in:
Analyses of widely-studied languages

Understudied / Endangered Languages and Linguistic Theory

- As the depth of formal semantic analysis increases...
  - As the breadth of languages that are analyzed in depth increases...
    - We learn that linguistic diversity is far more subtle and curious than we ever imagined.

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