The Hybrid Status of the Reportative Evidential in Tagalog

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Projection

(1) a. Emily, a chef, is from Rhode Island.

b. Maybe Emily, a chef, is from Rhode Island.

Implication of the appositive survives under embedding: it *projects*. (Potts, 2005)

A Taxonomy of Projective Meanings (Tonhauser et al., to appear)

Classes of projective contents (with sample triggers)	**Properties**	
	Contextual Felicity	Local Effect
A. (e.g., *too*/*avei* 'too')	yes	yes
B. (e.g., appositive)	no	no
C. (e.g., *only*/*–nte* 'only')	no	yes
D. (e.g., *that NP* (salience of ref.))	yes	no

Table: Projective contents in English and Guaraní

Evidentiality

- Evidentiality is the encoding of information source. (Faller, 2002; Murray, 2010)
- In Cusco Quechua, *-si* implies speaker has reportative evidence (Faller, 2002): it is a *reportative evidential*.

(2) Para-sha-n-**si**.
rain-prog-3-si
p=‘It is raining.’
ev= speaker was told that (Faller, 2002, 3)

- Cusco Quechua evidentials cannot embed. (Faller, 2002)

Outline

- The Tagalog reportative evidential *daw* is associated with an implication that can project (first clear evidence for a projective evidential implication)
- Projection is context dependent: scopal readings are also possible (currently requires ambiguity analysis)
- Formal analysis of *daw* improves upon previous analyses of projective content (Potts, 2005; Nouwen, 2007; Barker and Shan, 2008; AnderBois et al., 2010; Murray, 2010).

Daw is a reportative evidential (Schwager, 2010)

(3) Context: Bill saw a weather report that said it will rain later. He says:

Uulan **daw** mamaya.
rain.CONT RPT later

'It was reported that it will rain later.'

- The implication that there was a report is the *reportative implication*
- The proposition that was reported is the *prejacent*
- Bill must hear report to use *daw*, not just see rain clouds
- *Daw* can embed (Schwager, 2010; Kierstead, ms)

The modal *baka* 'maybe'

The epistemic possibility modal *baka* 'maybe' is a sentential modifier:

(4) Baka [kumain si Sue ng adobo.]$_S$
maybe eat.PERF.AV DIR Sue IND adobo
'Maybe Sue ate the adobo.'

Three logically possible readings with embedded *daw*:

- p = Sue ate the adobo (prejacent)
- REPORT(MAYBE(p))
- MAYBE(REPORT(p))
- MAYBE(p)∧REPORT(p)

REPORT(MAYBE(p))

(5) Context: Bill lives in a house with roommates Sam and Eric. He finds someone else ate rice he had in the fridge. He asks Sam about it. Sam says:

a. Baka [kumain si Eric ng kanin mo.]$_S$
maybe eat.PERF.AV DIR Eric IND rice 2SG.IND

'Maybe Eric ate your rice.'

Bill later tells his mother:

b. Baka [kumain **daw** si Eric ng kanin ko.]$_S$
maybe eat.PERF.AV RPT DIR Eric IND rice 1SG.IND

'It was reported that maybe Eric ate my rice.'

MAYBE(REPORT(p))

(6) Context: Jane and Sally are watching the TV, and the news is about to come on. They are wondering what the weather report will say. Jane says:

Baka [uulan **daw** bukas]$_S$.
maybe rain.CONT RPT tomorrow

'Maybe it will be reported it will rain tomorrow.'

MAYBE(p)∧REPORT(p)

(7) Context: Bill lives in a house with roommates Sam and Eric. He finds someone else ate rice he had in the fridge. He asks Sam about it. Sam says:

a. Kumain si Eric ng kanin mo.
eat.PERF.AV DIR Eric IND rice 2SG.IND

'Eric ate your rice.'

Bill isn't sure Sam is telling the truth. Bill later tells his mother:

b. Baka [kumain **daw** si Eric ng kanin ko.]$_S$
maybe eat.PERF.AV RPT DIR Eric IND rice 1SG.IND

'Maybe Eric ate my rice, as it was reported he did.'

Interim Summary

- *Daw*, a reportative evidential, can embed
- Three readings are possible; reading observed depends on context
- One reading involves projection: first clear evidence for projective evidential implication

Proposed readings of embedded evidentials

- McCready and Ogata (2007) propose Cusco Quechua evidential implications can project.
- These evidentials have been shown not to embed (Faller, 2002), and so cannot project.
- McCready and Ogata (2007) show wide and narrow scope readings for Japanese evidentials; no projection.
- (Matthewson et al., 2007) show wide and narrow scope readings for St'át'imcets evidentials; no projection.
- Lee (2011) proposes the Korean evidential *-te* in a conditional may have a projective implication (but no analysis is given).
- The implication associated with *-te* in conditionals is different than the implication found elsewhere, so not clearly projection.

Reportative implication of *daw* not a presupposition

- Schwager (2010) argues the reportative implication of *daw* presupposes a previous report.
- We show the reportative implication can contribute new information.
- *Daw* not a presupposition anaphoric to previous report.

Reportative implication can contribute new information

(8) Context: Phil, who lives in Ohio, has been inside all of yesterday and today, in his windowless apartment, working. He watches the weather report on the news, which says it rained yesterday. He calls his friend Sam who lives in California. He starts the conversation by saying:

Umulan **daw** kahapon.
rain.PERF RPT yesterday

'It was reported that it rained yesterday.'

Also cf. (5, 7)

Previous analyses of evidentials

- Cusco Quechua evidentials are speech act modifiers (Faller, 2002); can't capture embedded *daw*
- St'át'imcets (Matthewson et al., 2007) and Japanese (McCready and Ogata, 2007) evidentials are modals; doesn't explain projection
- Analyses of projection of Cheyenne (Murray, 2010) and Korean (Lee, 2011) evidentials are non-compositional

A Multistratal Dynamic Semantics

- We propose a new dynamic semantics for modeling *daw* that is part of a more general theory of projective meaning, including presuppositions and anaphora, conventional implicatures (CIs), etc.
- This account is compositional, but reconstructs many of the core notions of Heim (1982) in standard type theory.
- It is also an update of de Groote's (2006) theory with a notion of context sufficiently enriched for modeling projective meaning.
- We extend previous work on anaphora (Martin and Pollard, in press; Martin, in press) by making the semantics multistratal:
  - A 'global' level for not-at-issue content in the sense of Potts (2005) and Simons et al. (2011), and
  - A 'local' level for at-issue content, the target of semantic operators.
- Our goal: a general mechanism for modeling *daw* that extends to e.g. appositives, non-restrictive relatives, and other projective meanings in English.

Comparison with Previous Accounts I

- Our semantics allows anaphoric links between levels, avoiding a critical flaw in Potts's (2005) account of CIs.

  (9) Stan Bronowski, who took [an exam]$_i$, passed it$_i$ with flying colors. (Amaral et al., 2007, 4.24')

- In a sense, our theory generalizes Potts's, making the not-at-issue contribution available at each compositional step, rather than just at the utterance level (cf. Potts's "parsetree interpretation").
- For us, modulo separation of levels, the anaphora in (9) is simply handled just as any other instance of discourse anaphora.

Comparison with Previous Accounts II

- This theory offers a broader, more general treatment of discourse anaphora than the continuation-based semantics of Barker and Shan (2008) and Kubota and Uegaki (2009).
- Also, while Barker and Shan's account models donkey anaphora by liberalizing scope relations, the possibilities they predict may be *too* liberal.
- For example, for *If a farmer owns [a donkey]$_i$, he beats it$_i$*, their account yields the desired readings

$$\neg\exists_x.(\mathsf{farmer}\, x) \wedge \exists_y.(\mathsf{donkey}\, y) \wedge (\mathsf{own}\, y\, x) \wedge \neg(\mathsf{beat}\, y\, x)$$
$$\neg\exists_y.(\mathsf{donkey}\, y) \wedge \exists_x.(\mathsf{farmer}\, x) \wedge (\mathsf{own}\, y\, x) \wedge \neg(\mathsf{beat}\, y\, x)$$

but also the 'specific indefinite' readings

$$\exists_x.(\mathsf{farmer}\, x) \wedge \neg\exists_y.(\mathsf{donkey}\, y) \wedge (\mathsf{own}\, y\, x) \wedge \neg(\mathsf{beat}\, y\, x)$$
$$\exists_y.(\mathsf{donkey}\, y) \wedge \neg\exists_x.(\mathsf{farmer}\, x) \wedge (\mathsf{own}\, y\, x) \wedge \neg(\mathsf{beat}\, y\, x)$$

Comparison with Previous Accounts III

- Lastly, like the multistratal semantics in Nouwen (2007) (and AnderBois et al.'s (2010) sketched extension of it), our account captures the infelicity of certain quantified appositives, e.g.

(10) a. A Dutch boxer, a famous one, takes part in the event.

b. # Every Dutch boxer, a famous one, takes part in the event.

(Nouwen, 2007, 6)

- However, our semantics is more granular, allowing expressions with embedded CIs like (11), where Nouwen's explicitly does not:

(11) Leo, ⟨a lion, ⟨a mighty species⟩,⟩ swallowed the trainer whole. (Potts, 2005, 4.25, brackets ours)

Contexts I

- We assume the types e (entities) and p (propositions).
- The type p could be defined as (characteristic functions of) sets of worlds, but other options are available (and some would say preferable).
- The type of discourse contexts is

$$\mathrm{c}_{n,m} =_{\mathrm{def}} \mathrm{e}^{n+m} \to (\mathrm{p} \times \mathrm{p})$$

  where e^{n+m} is the type of vectors of $n+m$ entities (these are similar to Heim's "sequences").
- Intuitively, contexts have two levels: the global level involves n discourse referents (DRs), and the local level involves $n+m$ DRs.
- The pair of propositions in the consequent keeps the global and local contexts separate.

Contexts II

- We write $\mathbf{x}^n$ to abbreviate the n-ary vector $x_0, \ldots, x_{n-1}$, where for $k < n$, $\mathbf{x}_k$ is the k-th coordinate of $\mathbf{x}^n$.
- Contexts are written

$$\lambda_{\mathbf{x}^n} \lambda_{\mathbf{y}^m} . p \mid q$$

  - The global context p pertains to the DRs in $\mathbf{x}$, and
  - The local context q pertains to the ones in $\mathbf{y}$ and possibly also to the ones in $\mathbf{x}$.
- The functions $\uparrow$ and $\downarrow$ give access to the global and local contexts, respectively, so that if $c = \lambda_{\mathbf{x}^n} \lambda_{\mathbf{y}^m} . p \mid q$ is a context, then

$$\uparrow c = \lambda_{\mathbf{x}^n} \lambda_{\mathbf{y}^m} . p$$

gives the global context (only), and the local context is accessed by

$$\downarrow c = \lambda_{\mathbf{x}^n} \lambda_{\mathbf{y}^m} . q$$

Merging Contexts

- The operator $\Uparrow$ 'merges' a global and local context into a new global context.
- For example, merging the context $c = \lambda_{\mathbf{x}^n} \lambda_{\mathbf{y}^m} . p \mid q$ gives

$$\Uparrow c = \lambda_{\mathbf{x}^n} \lambda_{\mathbf{y}^m} . (p \text{ and } q) \mid \text{true}$$

  where and is propositional conjunction, and true is a necessarily true proposition.
- The $\Uparrow$ operator is used to make at-issue content into not-at-issue content (e.g., for appositives), and to 'update' the discourse context when a proffered content is accepted.

Proffered Contents

- Proffered contents, the meanings of declaratives, are modeled as partial operations on contexts (type k):

$$\mathrm{k} =_{\mathrm{def}} \mathrm{c} \rightharpoonup \mathrm{c}$$

  In a parallel with Heim (1983), the partiality allows contents that contain presuppositions to impose constraints on the discourse context.

- Dynamic properties are functions from n DRs to contents, for example

$$\textsc{donkey} =_{\mathrm{def}} \lambda_{mc}\lambda_{\mathbf{x}^{\overline{c}}}.\mathsf{true} \mid (\mathsf{donkey}\, \mathbf{x}_m)$$

  where $\overline{c}$ is the arity of c, the number of entities in its domain.

Multistratal Connectives

- Our dynamic semantics defines generalized quantifiers (GQs) and all other operators in terms of the conjunction AND, existential EXISTS, and negation NOT.
- Most notable for this analysis is dynamic negation, which targets the local context but leaves the global context untouched.
- For example, if the content k introduces n local DRs, its dynamic negation is

$$\textsc{not}\, k = \lambda_c \lambda_{\mathbf{x}^{\bar{c}}}.\, \uparrow (k\, c) \mid \mathsf{not}(\mathsf{exists}_{\mathbf{y}^n}.\, \downarrow (k\, c))$$

where not and exists are propositional negation and existential quantification, respectively. (Note the similarity with Heim's "existential closure.")

An Example Appositive I

- We demonstrate our semantics on the toy example

  (12) Pedro, a farmer, walks.

- First, *farmer* and *walks* are dynamic properties, like *donkey*, and for simplicity, the dynamic GQ $\textsc{pedro}_i$ just picks out the i-th DR:

$$\begin{aligned}
\textsc{farmer} &=_{\text{def}} \lambda_{nc}\lambda_{\mathbf{x}^{\bar{c}}}.\mathsf{true} \mid (\mathsf{farmer}\,\mathbf{x}_n) \\
\textsc{walk} &=_{\text{def}} \lambda_{nc}\lambda_{\mathbf{x}^{\bar{c}}}.\mathsf{true} \mid (\mathsf{walk}\,\mathbf{x}_n) \\
\textsc{pedro}_i &=_{\text{def}} \lambda_{Dc}\lambda_{\mathbf{x}^{\bar{c}}}.D\,\mathbf{x}_i \qquad (i < \bar{c})
\end{aligned}$$

- Then we define COMMA, echoing Potts (2005), for dynamic properties D and E:

$$\textsc{comma}\,D\,E =_{\text{def}} \lambda_{nc}\lambda_{\mathbf{x}^{\bar{c}}}.(\Uparrow (D\,n\,c)\,\mathbf{x}) \sqcap (E\,n\,(D\,n\,c)\,\mathbf{x})$$

  where $(p \mid q) \sqcap (p' \mid q') =_{\text{def}} (p \,\mathsf{and}\, p') \mid (q \,\mathsf{and}\, q')$.

An Example Appositive II

The dynamic meaning of (12) is modeled as

$$\begin{aligned}&\textsc{pedro}_i(\textsc{comma farmer walk})\\&= \lambda_c\lambda_{\mathbf{x}^{\bar{c}}}.\mathsf{true\ and\ (farmer}\,\mathbf{x}_i\mathsf{)\ and\ true} \mid \mathsf{(walk}\,\mathbf{x}_i\mathsf{)}\\&\equiv \lambda_c\lambda_{\mathbf{x}^{\bar{c}}}.\mathsf{(farmer}\,\mathbf{x}_i\mathsf{)} \mid \mathsf{(walk}\,\mathbf{x}_i\mathsf{)}\end{aligned}$$

but for *Pedro, a farmer, doesn't walk*, we have

$$\begin{aligned}&\textsc{not}(\textsc{pedro}_i(\textsc{comma farmer walk}))\\&\equiv \lambda_c\lambda_{\mathbf{x}^{\bar{c}}}.\mathsf{(farmer}\,\mathbf{x}_i\mathsf{)} \mid \mathsf{not(walk}\,\mathbf{x}_i\mathsf{)}\end{aligned}$$

so that only the at-issue content is negated.

Example with *daw*

- We'll analyze the following toy sentence in Tagalog:

(13) Baka tumahol **daw** si Fido.
Maybe bark.PERF.AV RPT DIR Fido
'Maybe it was reported that Fido barked.' (NS)
'It was reported that maybe Fido barked.' (WS)
'Maybe Fido barked, as it was reported that he did.' (P)

- Our account will allow the projective reading (P), as well as the two scope-taking readings narrow (NS) and wide (WS) with respect to *baka*.

Daw Analysis Preliminaries

- We start with *Fido*, defined for simplicity just like *Pedro*:

$$\text{FIDO}_i =_{\text{def}} \lambda_{Dc}\lambda_{\mathbf{x}^{\overline{c}}}.D\,\mathbf{x}_i \qquad (i < \overline{c})$$

- Then the intransitive verb *tumahol* is a dynamic property:

$$\text{TUMAHOL} =_{\text{def}} \lambda_{nc}\lambda_{\mathbf{x}^{\overline{c}}}.\mathsf{true} \mid (\mathsf{bark}\,\mathbf{x}_n)$$

- The modal *baka* operates on the local contribution of its complement content k:

$$\text{BAKA}\,k =_{\text{def}} \lambda_c\lambda_{\mathbf{x}^{\overline{c}}}.\uparrow(k\,c)\,\mathbf{x} \mid \mathsf{maybe}(\downarrow(k\,c)\,\mathbf{x})$$

- Finally, the nominal marker *si* is just the identity function on dynamic GQs $\lambda_N N$.

Modeling *daw*

- We then define *daw* separately for the scope-taking and projective cases, both with the type $\mathrm{k} \to \mathrm{k}$. First the scope-taking case DAW_S:

$$\text{DAW}_S\, k =_{\text{def}} \lambda_c \lambda_{\mathbf{x}^{\bar{c}}}.\, \uparrow (k\, c)\, \mathbf{x} \mid (\mathsf{rpt} \downarrow (k\, c)\, \mathbf{x})$$

  and next the projective case:

$$\text{DAW}_P\, k =_{\text{def}} \lambda_c \lambda_{\mathbf{x}^{\bar{c}}}.\, \uparrow (k\, c)\, \mathbf{x}\ \mathsf{and}\ (\mathsf{rpt} \downarrow (k\, c)\, \mathbf{x}) \mid \downarrow (k\, c)\, \mathbf{x}$$

- The only difference is that the (highlighted) report contributes to the local context in the scope-taking *daw* but to the global context in the projective variant.

Daw Example Analyzed

- We can now analyze (13) to give all three attested readings:

$$\begin{aligned}
&\textsc{baka}(\textsc{daw}_S((\textsc{si fido}_i)\,\textsc{tumahol})) \\
&= \lambda_c\lambda_{\mathbf{x}^{\bar{c}}}.\mathsf{true} \mid \mathsf{maybe}(\mathsf{rpt}(\mathsf{bark}\,\mathbf{x}_i)) && \text{(NS)} \\
&\textsc{daw}_S(\textsc{baka}((\textsc{si fido}_i)\,\textsc{tumahol})) \\
&= \lambda_c\lambda_{\mathbf{x}^{\bar{c}}}.\mathsf{true} \mid \mathsf{rpt}(\mathsf{maybe}(\mathsf{bark}\,\mathbf{x}_i)) && \text{(WS)} \\
&\textsc{baka}(\textsc{daw}_P((\textsc{si fido}_i)\,\textsc{tumahol})) \\
&\equiv \lambda_c\lambda_{\mathbf{x}^{\bar{c}}}.\mathsf{rpt}\,(\mathsf{bark}\,\mathbf{x}_i) \mid \mathsf{maybe}(\mathsf{bark}\,\mathbf{x}_i) && \text{(P)}
\end{aligned}$$

- Note that the grammar allows a second projective reading:

$$\begin{aligned}
&\textsc{daw}_P(\textsc{baka}((\textsc{si fido}_i)\,\textsc{tumahol})) \\
&\equiv \lambda_c\lambda_{\mathbf{x}^{\bar{c}}}.\mathsf{rpt}\,(\mathsf{maybe}(\mathsf{bark}\,\mathbf{x}_i)) \mid \mathsf{maybe}(\mathsf{bark}\,\mathbf{x}_i) && \text{(P')}
\end{aligned}$$

But (P') is pragmatically odd, since the speaker is simultaneously asserting a proposition p and commenting that p was reported.

Summing Up

- Our fieldwork has shown Tagalog *daw* to be the first known instance of an evidential associated with projective content.
- The multistratal semantics we propose not only accounts for both its scope-taking and projective readings, but is also general enough to account for e.g. CIs in English in a way that improves on previous work.
- More remains to be said about exactly how the discourse context dictates which readings are possible for *daw*.

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