Bipartite indexicals in Yucatec
SULA 9, Santa Cruz, CA, May 6, 2016
Jürgen Bohnemeyer  jb77@buffalo.edu

Abstract
A curious and under-researched property of some Mayan languages (I present data from Mopan, Tseltal and Yucatec) is the bipartite morphology of space- and time-indexical expressions. These expressions combine a base – an element that appears in the syntactic position in which the referent of the indexical is interpreted (i.e., enters the semantic composition) – with a clause-final particle. Strikingly, it is this second element, the particle, that determines whether the bipartite indexical is interpreted anaphorically or exophorically. Clauses do not accept more than one such particle. In case of multiple triggers in a single clause, the particle that is realized is determined according to a hierarchy whereby exophoric triggers trump anaphoric ones. The two constituents of bipartite indexicals seem to loosely map into the two tiers of Kaplan’s (1989) theory of indexicality, with the final particles primarily expressing ‘character’, a mapping from possible contexts into contents, and the non-final component primarily expressing ‘content’, a mapping from worlds to extensions. A Situation-Semantic analysis is proposed which treats the indexical particles as imposing constraints on ‘resource situations’ involved in the interpretation of the base.

Overview
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1 A first acquaintance with the phenomenon: Yucatec

1 Examples (1)-(3), (7)-(8), (11), and (18) are based on Blair & Vermont-Salas 1965-1967. Examples (4) and (6) are from the unpublished text Bix u meta ’l hump éel k’axbil nah by Esteban Pool Kaaw recorded and transcribed by Christian Lehmann with the aid of Ramón May Cupul. In some cases, the examples have been simplified for expository purposes. Examples (5), (8)-(9), (14)-(17), and (20)-(21) were elicited with the Demonstrative Questionnaire (Wilkins 1999). The remaining examples have been collected in other contexts. The orthographic representation is morphemic rather than morpho-phonemic. The orthography applied is based on Lehmann (1998). In the interlinear morpheme glosses, the following conventions are used: ‘-’ for affixes; ‘=#’ for clitics; ‘+’ for compounding; ‘\’ for subsegmental realization or infixation. Abbreviations in the glosses include the following: 2- 2nd person; 3 – 3rd person; A – set-A (‘ergative’/possessor) clitics; ATP – antipassive derivation; B – set-B (‘absolutive’) suffixes; CAUSE – causal preposition; CON – narrative perfective aspect connective; D1 – immediate clause-final indexical particle; D2 – non-immediate clause-final indexical particle; D3 – text-deictic clause-final
(1) **He’l** hun-p’iit ts’áak=a’!
PRSV one-bit cure\ATP=D1
‘Here’s some medicine!’

(2) K-u=bin Xokempich le=bèeh *he’l=a’?*
IMPF-A3=go Xokempich DEF=way PRSV=D1
‘Does **this way here** go to Xokempich?’

(3) Ba’x **le=he’l=o’?** Ba’x u=k’àaba’?
what DEF=PRSV=D2 what(B3SG) A3=name(B3SG)
‘What’s **this**? What’s its name?’

(4) U=hòol+nah ken u=bin
A3=hole+house SR.IRR A3=go
te’l  t-u=mòoy=a’.
there PREP-A3=apse=D1
‘The door is what will end up **here in the apse**’

(5) le=liibro ñàan te’l=o’
DEF=book [EXIST(B3SG) there=D2]s
‘the book **that’s there**’ (distal or anaphoric!)

(6) **Le=te’l=a’,** es que kul-ub.²
DEF=there=D1 is.which sit-INSTR(B3SG)
‘This one here, it’s a pillar (lit. thing for sitting)’

(7) A=ti’a’l le=nah=a’?
A2=property(B3SG) DEF=house=D1
‘Is **this house** yours?’

(8) A=ti’a’l lel=a’?
A2=property(B3SG) DEF=D1
‘Is **this** yours?’

(9) A=ti’a’l le=liibro=o’?
‘Is **this book** yours?’

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particle; DET – determiner stem; EXIST – existential/locative/possessive predicate; F – feminine prefix; IMPF – imperfective aspect; INC – incompletive aspect; INCH – inchoative derivation; INSTR – instrument nominalization; IRR – irrealis modality; NEG – negation; PREP – generic preposition; PROG – progressive aspect; PROSP – prospective aspect; PRSV – presentative stem; PRV – perfective aspect; SG – singular; SR – subordinator.

²As can be seen here, the clause-final particles aren’t always clause-final. They appear in two positions: (i) on the right edge of the sentence, but preceding any non-embedded sentence-final material; (ii) on the right edge of left-dislocated phrases.
A2=property(B3SG) DEF=book=D2

‘Is that book yours?’

(10) Káa=h-òok
CON=PRV-enter(B3SG)

le=x-ch’úup chak u=nòok’=o’, ()
DEF=F-female red(B3SG) A3=garment=D2

‘(And then) the woman dressed in red entered, (…)’

(11) Ba’x k’ìin k-uy=úuch-ul lel=o’?
what sun IMPF-A3=happen-INC DEF=D2

‘What day does that usually happen?’

| Table 1. Yucatec spatial deixis (based on Hanks 1990: 18–19) |
|---|---|---|---|
| Base | Indexical particle | Gloss |
| Present- | =a’ (D1) | =o’ (D2) | -be’ | =i’ | =e’ (D3) |
| deive | | | | | |
| he’l | he’la’ | he’la’ | he’l | =a’ | ‘Here it is’ |
| / he’ ... =a’ | / he’ ... =o’ | / he’ ... =o’ | / he’ ... =o’ | ‘There it is’ |
| te’l | te’la’ | te’la’ | te’l | =a’ | ‘Right there/here’ |
| / te’ ... =a’ | / te’ ... =o’ | / te’ ... =o’ | / te’ ... =o’ | ‘There’ |
| ti’ | ti’ | ti’ | ti’ | =i’ | ‘There (anaphoric)’ |
| way | way | way | way | =e’ | ‘(In) here’ |
| tol | tolo’ | tolo’ | tolo’ | =o’ | ‘(Out) there’ |
| Ad- | le | lela’ | lela’ | =a’ | ‘This’ |
| nominal | / le ... =a’ | / le ... =a’ | / le ... =a’ | ‘That’ |
| | lelo’ | lelo’ | lelo’ | =o’ | ‘As for that one’ |
2. Other languages

Mopan (Mayan, Yucatecan; Belize, Guatemala):

(12) (...) inw= soirée-aj \text{ix=ch’up a la’} \text{A1SG=wife-APP-CMP(B3SG) DET.F=female DET.N D1}
    ‘(...) I married this lady.’ (Danziger 1994: 894)

(13) Walak u=tz’aj \text{kolor a viido yo a kana’}?
    \text{HAB A3=give(B3SG) color DET.N video DET.N.D2}
    ‘Does that video (camera) take (lit. give) color (pictures)?’ (Danziger 1994: 894)

Tseltal (Mayan, Greater Tzeltalan; Chiapas):

(14) \text{Lum ay in-e}
    there \text{EXIST(B3SG)?:D2}
    ‘It’s over there’ (Brown 2006: 239)

(15) \text{Li’ ay-i}
    here \text{EXIST(B3SG)-D1}
    ‘Here it is’ (Brown 2006: 240)

Structures reminiscent of the Mayan bipartite deixics are also documented in several varieties of Otomí (Western Oto-Manguean, central Mexico), including Eastern Highland Otomí (Voigtlander and Echegoyen 1985) and Ixtenco Otomí (Lastra 1997), and in Seri (isolate, Sonora; O’Meara 2010).³

³ The adnominal demonstratives of Seri derive from nominalizations of posture and motion verbs, creating a system of demonstrative classifiers (more on this below). The nominalizations themselves form definite articles. They produce the adnominal demonstratives in combination with one of three morphemes that are the primary locus of the expression of spatial deixis, not unlike in Mayan languages. Compare the second and third column of Table 2 to the three columns on the right.

Table 2. Definite articles and demonstrative adjectives (based O’Meara 2010: 66, after Moser & Marlett 2005: 843)

<table>
<thead>
<tr>
<th>Property of referent classified by the verb root</th>
<th>Definite article singular</th>
<th>Definite article plural</th>
<th>Proximal demonstrative</th>
<th>Medial demonstrative</th>
<th>Distal demonstrative</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘Standing’ (support at end of dominant vertical axis)</td>
<td>\text{cop/cap}</td>
<td>coyolca</td>
<td>hip-cop, hiz-cop [liquid]</td>
<td>ti-cop, tacop [liquid]</td>
<td>him-cop</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>hiz-coyolca</td>
<td>ta-coyolca</td>
<td>him-coyolca</td>
</tr>
<tr>
<td>‘Sitting’ (support at end of non-dominant vertical axis)</td>
<td>\text{quij}</td>
<td>coxalca</td>
<td>hip-quij</td>
<td>ti-quij</td>
<td>him-quij</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>hiz-coxalca</td>
<td>ta-coxalca</td>
<td>him-coxalca</td>
</tr>
</tbody>
</table>
3. A more detailed look at Yucatec

(16) There can be only one: The Highlander Principle and the hierarchy of particles

\[=a'\quad =o'/=e'\quad =i'\]
\[D1 > D2/D3 > D4\]

(17) \(D4 =i'\) with negation

\[\text{Lel-o'b=}o'\quad \text{ma'}\quad \text{pek'-o'b=}i',\quad \text{kristyàan-o'b}\]
\[\text{DEM-3PL=D2 NEG(B3SG) dog-B3PL=D4 Christian-B3PL}\]
\[\text{‘As for those ones, they are not dogs, they are humans.’}\]
\[(\text{Andrade & Måas Colli 1999:62)}\]

(18) \(D4 =i'\) with an anaphoric place adverb

\[(…\text{te'1 chik'in=}o'\quad \text{náats'}\quad \text{te=}lu'm=}o'\]
\[\text{there west=D2 near(B3SG)PREP:DEF=earth=D2}\]
\[ti'\quad \text{pek-ekbal}\]
there(B3SG) supported.as.if.fallen.down-DIS(B3SG)

hun-p’él chan bòola=i’.
one-CL.IN DIM ball=D4

‘(…) there in the west, nearby on the ground, that’s where a little ball is lying.’

(19) Evidence for D1 > D4

Tak káa=h-sùut-nah t-u=tsòn=e’,
even CON=PRV-turn-CMP(B3SG) PREP-A3=shoot\ATP=D3
tak be’òora ma’ wèen-ek-en=a’
even now NEG(B3SG) sleep-SUBJ-B1SG=D1

‘Since he returned from hunting, until now I have not slept’
(Bohnemeyer 2002: 133)

(20) Evidence for D3 > D4

Le=ma’ k’uch-uk-en=e’ káa=h-hóok’ leti’
DEF=NEG(B3SG) arrive-SUBJ-B1SG=D3 CON=PRV-exit(B3SG) it
‘(When) I had not yet arrived, she left’ (Bohnemeyer 2002: 135)

(21) Evidence for D1 > D2

(…) tuméen don Ignacio Bravo h-tàal
CAUSE don Ignacio Bravo PRV-come(B3SG)
u=hets’-kun-t le=màaya-s-o’b way tún ba’tehil-o’b=a’
A3=quiet-CAUS-APP(B3SG) DEF=Maya-PL-PL here PROG:A3 fight-PL=D1

‘(…) because don Ignacio Bravo came to pacify the Mayas who were fighting here’

(22) D3 =e’ as topic marker; evidence for variation between D2 =o’ and D3 =e”

Hun-p’él téen=e’, hun-túul máak=e’,
one-CL.IN time=D3 one-CL.AN person=D3
káa=h-k’áax le=ha’=o’/=e’
CON=PRV-fall(B3SG) DEF=water=D2/=D3

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4 Both versions of the sentence were judged to be equally good by all four speakers I consulted.
Jürgen Bohnemeyer, University at Buffalo (SUNY)

Bipartite indexicals in Yucatec

\( \text{ma' t-u=pak'} \quad \text{u=kòol=i'} \)

\( \text{NEG(B3SG) PRV-A3=plant(B3SG) A3=clear ATP=D4} \)

‘One time, (there was) a man, when the rain fell, he didn’t plant his \text{milpa}’ (i.e., he didn’t plant corn at the onset of the rainy season)

**Table 3. All together now: Yucatec spatial, temporal, and person deictics in one epic table (Hanks 1990: 18-19)**

<table>
<thead>
<tr>
<th>Terminal Deictics</th>
<th>Gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>a’</td>
<td>‘Here it is (Tact Pres)’</td>
</tr>
<tr>
<td>o’</td>
<td>‘There it is (Vis Day)’</td>
</tr>
<tr>
<td>b’e’</td>
<td>‘There it is (Asp Day)’</td>
</tr>
<tr>
<td>i’</td>
<td>‘Indeed, for sure’</td>
</tr>
<tr>
<td>a</td>
<td>‘Right there, here (Immed)’</td>
</tr>
<tr>
<td>e</td>
<td>‘(Not) here (incl)’</td>
</tr>
<tr>
<td>o</td>
<td>‘(Out) there (excl)’</td>
</tr>
<tr>
<td>ti’</td>
<td>‘This one (Immed)’</td>
</tr>
<tr>
<td>ti’-o’b’</td>
<td>‘That one (Non-Immed)’</td>
</tr>
<tr>
<td>le</td>
<td>‘The one’</td>
</tr>
<tr>
<td>le</td>
<td>‘The (def art)’</td>
</tr>
</tbody>
</table>

**Table 1.1 Synopsis of Maya Deictics**

<table>
<thead>
<tr>
<th>Terminal Deictics</th>
<th>Gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>‘I’ (1sg)</td>
</tr>
<tr>
<td>o</td>
<td>‘You (2sg)’</td>
</tr>
<tr>
<td>e</td>
<td>‘We (1pl)’</td>
</tr>
<tr>
<td>e’</td>
<td>‘You (3pl)’</td>
</tr>
<tr>
<td>ti’</td>
<td>‘He, she, it, the one (3sg)’</td>
</tr>
<tr>
<td>ti’-o’b’</td>
<td>‘They, the ones (3pl)’</td>
</tr>
<tr>
<td>le</td>
<td>‘This time (of day)’</td>
</tr>
<tr>
<td>le</td>
<td>‘Back then (shared, distant past)’</td>
</tr>
<tr>
<td>b’e’</td>
<td>‘Now, presently’</td>
</tr>
<tr>
<td>b’e’</td>
<td>‘Now, today, nowadays’</td>
</tr>
<tr>
<td>b’e’</td>
<td>‘Just (immed past)’</td>
</tr>
<tr>
<td>b’e’</td>
<td>‘Still, even, now’</td>
</tr>
<tr>
<td>b’e’</td>
<td>‘Like this’</td>
</tr>
<tr>
<td>b’e’</td>
<td>‘Like that, so’</td>
</tr>
<tr>
<td>b’e’</td>
<td>‘So, thus, since’</td>
</tr>
</tbody>
</table>

D2 =o’ is not inherently exophoric: Bohnemeyer (2012)

**Figure 1. Summary of responses to eight of the 25 Demonstrative Scenes (Wilkins 1999)**
4. Bipartite indexicals vs. reinforcers

Bipartite indexicals bear a superficial resemblance with ‘reinforcer’ constructions (e.g., Roehrs 2010 and references therein):

(24) a. This book here
    b. That book (over) there

(25) a. #This book there
    b. #That book here

The key difference consists in reinforcer constructions involving traditional demonstratives with proper deictic force (or ‘character’; Kaplan 1989) as one constituent. In contrast, no constituent of a bipartite deictic is a proper European-style demonstrative: The constituent that represents the place of the referent in the semantic composition does not have deictic force; and the element that expresses the ‘character’ is a clause-level functional element, not a determiner or adverbial. Yucatec in fact employs constructions akin to reinforcers as well:

(26) Le=ráadyo=’ (yàan te’l=’o’), hach ma’+lóob.
DEF=radio=D2 EXIST(B3SG) there=D2 really NEG+bad(B3SG)
‘That radio (that is over there) is really nice’

(27) A=ti’a’l le=liibro (he’l)=’o’?
A2=property(B3SG) DEF=book PRSV=D2
‘Is that book (there) yours?’

These reinforced forms appear to be primarily used for referents on which joint attention has not already established and to which the speaker cannot easily draw the addressee’s attention:

![Diagram of deictic anchoring and attention calling in Yucatec spatial deictics](Bohnemeyer 2012: 121)

- In Yucatec bipartite deictics, character is predominately expressed by the clause-final particles:
  - D1 = a’ expresses exophoricity and proximity to the deictic center;
  - D2 = o’ is an underspecified indexical used for both exophoric and anaphoric reference;
  - D3 = e’ is used for both anaphoric and text-deictic reference;
  - D4 = i’ is used for anaphoric reference to places and (for unknown reasons) for negation.

- The non-final part of the bipartite deictics determines where the referent of the indexical enters the semantic composition of the sentence. In this sense, it is associated with the expression of ‘content’.

- However, the mapping is not a strict isomorphism
  - Elements of content in the particles: the restrictions of D4 = i’
  - Some of the non-final components appear to be inherently exophoric
    - (way ... = e’/ = a’ ‘here’; be’òora ... = a’/ = e’)

6. Questions

- What is the semantic motivation underlying the bipartite structure of Yucatec indexicals, and what is its pragmatic function?

- The deictic particles are expressed at the sentence level. This constitutes an apparent syntax-semantics mismatch. Why does this happen?

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5 It is of course very possible that there are two homophous D4 particles. However, Occam’s Razor mandates that this should not be our first assumption.
The Highlander Principle stipulates that every Yucatec matrix clause (and every LDed /topicalized phrase) is assigned to exactly one type of indexical reference. What is the semantic motivation and pragmatic function of this?

Most Yucatec spatio-temporal indexicals exhibit the bipartite structure, but none of the pronominal expressions do. Why is this?

Table 4. Distribution and functions of the two paradigms of Yucatec cross-reference markers

<table>
<thead>
<tr>
<th>Environment</th>
<th>Set A</th>
<th>Set B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transitive verbs (active voice)</td>
<td>A ctor</td>
<td>U undergoer</td>
</tr>
<tr>
<td>Intransitive verbs; transitive verbs in non-active voice</td>
<td>S (the single argument of intransitive clauses in incompletive ‘status’)</td>
<td>S (the single argument of intransitive clauses in completive, subjunctive, extrafocal ‘status’)</td>
</tr>
<tr>
<td>Other lexical categories</td>
<td>Possessor of nominal</td>
<td>S of non-verbal predicates</td>
</tr>
</tbody>
</table>

Table 5. The morphological forms of the two paradigms of cross-reference markers

<table>
<thead>
<tr>
<th>Number</th>
<th>Person</th>
<th>Set A</th>
<th>Set B</th>
</tr>
</thead>
<tbody>
<tr>
<td>SG</td>
<td>1</td>
<td>in(w)= -en</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>a(w)= -ech</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>u(y)= -Ø (-ih)</td>
<td></td>
</tr>
<tr>
<td>PL</td>
<td>1</td>
<td>(a)k=...-o’n</td>
<td>-o’n</td>
</tr>
<tr>
<td></td>
<td>1 INCL</td>
<td>(a)k=...-o’ne’x</td>
<td>-o’ne’x</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>a(w)=...e’x</td>
<td>-e’x</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>u(y)=...o’b</td>
<td>-o’b</td>
</tr>
</tbody>
</table>

(28) Síi in=ìiho-ech, in=pàal-ech, ko’x!
‘You ARE my son alright, you ARE my child; let’s go!’ (Lehmann ms.a)

Table 4. The paradigm of independent pronouns

<table>
<thead>
<tr>
<th>Number</th>
<th>Person</th>
<th>Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>SG</td>
<td>1</td>
<td>tèen</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>tèech</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>leti’</td>
</tr>
<tr>
<td>PL</td>
<td>1</td>
<td>to’n</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>te’x</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>leti’o’b</td>
</tr>
</tbody>
</table>

(29) A’l tèen, José, ba’x le=he’l=o’, ba’x u=k’àaab’a’.
say(B3SG) me José what(B3SG)DEF=PRSV=D2 what(B3SG)A3=name
‘Tell me, José, what that there is, what is it’s name.’ (BLAIR & VERMONT-SALAS 1965)

(30) Hay-p’éeel àanyos yáan tèech?
how-CL.IN year:PL EXIST(B3SG) you
tèech? ‘How old are you (lit. how many years are with you)’
7. Toward a Situation-Semantic treatment

7.1. Background on information-based Situation Semantics – The following is excerpted from Devlin (2006).

- The propositional content of natural language utterances is assumed to have the format $s \models \sigma$, where $s$ denotes a situation, $\sigma$ an ‘infon’ or situation type, and $\models$ the ‘support’ relation, which indicates that $s$ makes $\sigma$ factual.

- Infons have the internal form $\ll R, a_1, \ldots, a_n, I \gg$ or $\ll R, a_1, \ldots, a_n, 0 \gg$, indicating that relation $R$ does (1) or does not (0) apply to arguments (‘objects’) $a_1, \ldots, a_n$ in a situation characterized by the infon.

- The interpretation of a natural language utterance is assumed to involve maximally three distinct situations: the described situation, which the utterance is about; the utterance situation, and a resource situation.

  o The utterance situation uniquely assigns the roles of speaker and addressee, along with the time and place of the utterance.

  o Resource situations are situations distinct from topic and utterance situation that are invoked by utterances to support meaning components that are generally not at issue in the utterance. Resource situations for example license the uniqueness presupposition of definite descriptions and provide the antecedents of non-deictic(ally used) pronouns. Cf. especially Cooper (1996: 5-16) for a detailed treatment.

- Linguistic expressions are treated as carrying two kinds of meaning: an abstract meaning, which is more or less the meaning specified in the interlocutors’ mental lexicon and grammar, and a meaning-in-use, which is more or less the referent associated with a particular token in a particular utterance.

  o The meaning-in-use of an expression $\alpha$, denoted $\ll |\alpha| \gg$, is viewed as a relation $\ll |\alpha| \ll a$ between the utterance (situation) $u$ that contains the particular token of $\alpha$ and a semantic object $a$ of the relevant type picked out by $\alpha$ in the context of $u$.

    - For example, the English pronoun $I$ refers in any given utterance to the speaker of that utterance:

      (31) $u \models I \ll a$ iff $u : U(I)$ and $a = a_u$ (Devlin 2006: 14), where $u : U(I)$ stipulates that $u$ is of type $U(I)$ (see below)

  o The abstract meaning of an expression $\alpha$, denoted $M(\alpha)$, is a mapping of the semantic types of the objects mapped by the meaning-in-use.

    - In the case of $I$, this is a mapping between the type of utterances containing $I$ (32) and the type of objects that can be identified with the speaker $a_u$ (33).
\[(32) \quad U(I) = [\dot{u} \mid \dot{u} \models \langle\text{speaking-to}, \dot{a}_u, \dot{b}_u, \dot{l}_u, \dot{t}_u, 1 \rangle \land \langle\text{utters}, \dot{a}_u, 1, \dot{l}_u, \dot{t}_u, 1 \rangle]\]

\[(33) \quad E = [\ddot{a} \mid \ddot{a} \models \langle\text{=, } \ddot{a}, \ddot{a}_u, \dot{l}_u, \dot{t}_u, \dot{1} \rangle]\] (Devlin 2006: 15)

- Expressions such as \(\dot{u}, \dot{a}_u, \dot{b}_u, \dot{l}_u, \dot{t}_u\) are **parameters** (i.e., variables).
- \(\dot{a}_u, \dot{b}_u, \dot{l}_u, \dot{t}_u\) refer to the speaker, addressee, place, and time of utterance.
- (32) and (33) are **type-abstraction** rules that define types with respect to the situations in which exponents of these types occur (not unlike lambda abstraction).

- The mapping itself may between \(U(I)\) and \(E\) may be expressed as in (34):

\[(34) \quad ||I|| = \{(u, a) \mid u : U(I) \land a : E \text{ such that } U(I)[\mathcal{M}(I)]E\}\] (Devlin 2006: 15)

- The context-dependence of the meanings of natural language expressions can be captured by means of **speaker-connections**. These are functions that map the utterance situation into the meaning-in-use the expression is associated with in the utterance context.

  - For example, non-deictic uses of the pronoun \(he\) require a resource-situation-based speaker connection \(c^{\text{res}}_{u}(HE)\) that singles out an individual object as in (35):

\[(35) \quad c^{\text{res}}_{u}(he) = h \text{ such that } r \models \langle\text{male, } h, 1 \rangle\] for some resource situation \(r\)

  - A crude way of defining tense meanings via speaker-connections is represented in (36), where \(t_u\) denotes again the time of utterance (cf. Devlin 2006: 20):

\[(36) \quad c_u(\text{PRS}) = t_u
\]
\[(37) \quad c_u(\text{PAST}) = \text{some } t \text{ such that } t < t_u
\]
\[(38) \quad c_u(\text{FUT}) = \text{some } t \text{ such that } t_u < t\]

- The propositional content of (37a) can be represented as in (37b), which is supported by the resource situation described in (37c):

\[(37) \quad a. \quad \text{Floyd presented a paper}
\]
\[(37) \quad b. \quad s_u \models \exists \hat{p} \exists \hat{i} \langle\text{presents, } \hat{f}, \hat{p}, \hat{i}, 1 \rangle\]
\[\text{where } s_u \text{ is the described situation and } \hat{i} \text{ is constrained by } c_u(\text{PAST})
\]
\[(37) \quad c. \quad r_k \models \langle\text{person, } f', t_f, 1 \rangle \land \langle\text{named, } f', \text{FLOYD, } t_f, 1 \rangle
\]
\[\land \langle\text{male, } f', \text{FLOYD, } t_f, 1 \rangle\]
Jürgen Bohnemeyer, University at Buffalo (SUNY)

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(37a) presupposes the existence of a suitable resource situation in which there is an individual that uniquely satisfies the properties stipulated in (37c) – but it doesn’t specify this resource situation.

- In contrast, the propositional content of (38a) is represented in (38b), with (38c) specifying the appropriate resource situations:

(38)

a. *Floyd presented the paper*

b. \( s_u \models \exists i \langle \text{presents}, f, \hat{p}, \hat{t}, 1 \rangle \)

where \( s_u \) is the described situation and \( i \) is constrained by \( c_u(\text{PAST}) \)

c. \( r_k \models \langle \text{person}, f', t_f, 1 \rangle \land \langle \text{named}, f', \text{FLOYD}, t_f, 1 \rangle \)

\( \land \langle \text{male}, f', \text{FLOYD}, t_f, 1 \rangle \)

& \( r_p \models \langle \text{paper}, p', t_p, 1 \rangle \)

7.2. Why information-based Situation Semantics?

- The advantage of Situation Semantics for the purposes of modeling the semantics of bipartite indexicals lies in the ability to tie the semantic contribution of the sentence-level particles to the specification of a particular kind of resource situation. It is plausible that this resource situation is an utterance-level semantic property and thus should be specified at the sentence level.

- The decision to go specifically with the traditional information-based variety of Situation Semantics (Barwise & Perry 1983; Cooper 1996; Devlin 2006) is motivated by the non-trivial challenge attached to representing resource situations in the technically less “exotic” alternative, probabilistic Situation Semantics (Kratzer 1989, 2002, 2014).

- For a treatment of the semantics of English demonstratives in probabilistic Situation Semantics, see Elbourne (2008).

7.3. Bipartite deictics in Situation Semantics – Consider the contrast between D1 =a’ and D2 =o’, setting the semantically more specific D3 and D4 aside for the moment.

- In a nutshell, the proposal is that both D1 and D2 introduce a resource situation to the interpretation of the utterance. In addition, D1 requires this resource situation to be a part of the utterance situation characterized in terms of speaker proximity. As in Bohnemeyer (2012), D2 picks up distal interpretations under exophoric reference by scalar implicature (cf. Figure 1). Speaker’s connections fix these context-dependencies as indicated in (39)-(40):

(39) \( c^*_u = \{(l, t) \mid r \models\langle \text{speaker_proximal}, u, l, t, 1 \rangle \} \) for some resource situation \( r \)
In either case, the resource situations serve to introduce places and times that can then be picked up in the semantic interpretation of the base.

In the case of \( =o' \), the nature of this resource situation is left unspecified. This is in accordance with the fact that \( =o' \) has both exophoric and anaphoric interpretations and that the exophoric interpretations are driven by scalar implicature (Bohnemeyer 2012; cf. Figure 1).

In the case of \( =a' \), the resource situation is required by (39) to be ‘speaker-proximal’. This property can be defined via more primitive topological proximity relations as follows:

\[
\begin{align*}
\text{a. } & S(u) = [\hat{e} \mid \hat{e} \models \ll \text{speaker_proximal}, u, l, t, 1 \gg] \\
\text{b. } & T(u) = [\hat{e} \mid \hat{e} \models \ll \text{proximal}, u, l_e, t_e, 1 \gg \land \ll \text{proximal}, u, t_e, t_u, 1 \gg] \\
\text{c. } & w \models (S(u) \Rightarrow T(u))
\end{align*}
\]

The propositional content in (41c) is a constraint. It stipulates that in the actual world \( w \), speaker-proximal situations are situations whose location \( l_e \) is proximal to the location of the speaker \( a_u \) of utterance situation \( u \) and whose time \( t_e \) is proximal to the utterance time \( t_u \). Bohnemeyer (2012) presents evidence in support of speaker-proximity, but not addressee-proximity, to influence the use of \( =a' \); cf. Figure 1.

Now consider the example in (42):

\[
\begin{align*}
\text{A=ti’a’l} & \quad \text{le=nah=}=a'/=o' \\
\text{A2=property(B3SG)} & \quad \text{DEF=house=D1/=D2} \\
\text{‘This/that house is yours’}
\end{align*}
\]

The propositional content of this sentence can be captured as in (43) regardless of which particle is selected (\( b_u \) is the addressee of the utterance):

\[
\begin{align*}
s_u \models \ll \text{owns}, b_u, h, t, 1 \gg
\end{align*}
\]

The propositional content of the sentence is supported by a resource situation triggered by the definite determiner \( le \). The nature of this resource situation is constrained by the deictic particle. \( =a' \) selects (44a), while \( =o' \) is compatible with the less restrictive (44b):

\[
\begin{align*}
\text{a. } & r \models \ll \text{house}, h', t_b, 1 \gg \land \ll \text{speaker_proximal}, u, l_u, t_u, 1 \gg \\
\text{b. } & r \models \ll \text{house}, h', t_b, 1 \gg
\end{align*}
\]

Temporal deictics (cf. Table 1) are straightforwardly accommodated to this treatment since the speaker-proximality property is defined with respect to both places and times.
7.4. **Answers** – The proposed analysis suggests the following answers to the questions raised in §6:

- What is the semantic motivation underlying the bipartite structure of Yucatec indexicals, and what is its pragmatic function?
  - *The particles serve to identify the involvement of a resource situation in the interpretation of an utterance and classify this resource situation.*

- The deictic particles are expressed at the sentence level. This constitutes an apparent syntax-semantics mismatch. Why does this happen?
  - *Resource situations are involved in the interpretation of utterances, i.e., in the mapping from sentences to contexts. Arguably, no syntax-semantics mismatch is involved.*

- The Highlander Principle (16) stipulates that every Yucatec matrix clause (and every LDed /topicalized phrase) is assigned to exactly one type of indexical reference. What is the semantic motivation and pragmatic function of this?
  - *The Highlander Principle stipulates that if an utterance requires a speaker-proximal resource situation for its interpretation, this fact must be marked by selecting =a’. Given the narrower specification of this type of resource situation, this markedness relation makes perfect sense.*

- Most Yucatec spatio-temporal indexicals exhibit the bipartite structure, but none of the pronominal expressions do. Why is this?
  - *I can offer only a partial answer to this question so far: the interpretation of deictic pronouns does not involve resource situations (cf. (31)-(34) above). It is conceivable that this particle-less rule is then extended to anaphoric pronouns for the benefit of uniformity, but that is at best a weak explanation.*

8. **And now for some wild-eyed speculation** – While the bipartite indexicals of Mayan languages seem exotic at first sight, better-studied languages such as English likewise systematically classify utterances in terms of whether or not their interpretation is anchored to the utterance situation. They do so, however, through tense inflection. Strikingly, Yucatec has been described as a tenseless language (Bohnemeyer 1998, 2002, 2009).

(45) **Táan** in=méet-ik le=nah=o’
    **PROG** A1SG=do:APP-INC(B3SG) DEF=house=D2
    ‘I am/was/will be building the house’

Future research will have to examine whether this distribution of properties is coincidence.
References


