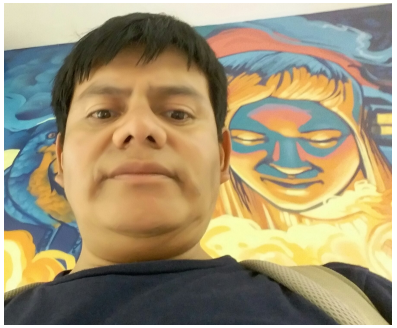
Sign, Gesture, and Meaning in Mesoamerica

Robert Henderson
University of Arizona

IRC “France-Arizona Institute for Global Grand Challenges”

Jeremy Kuhn
Institut Jean Nicod



Juan Ajsivinac Kaqchikel Amaq’

Sam Prins
University of Arizona

Cyradis Gonzalez
University of Arizona

Sybil Vachaudez
Institut Jean Nicod

Robert Henderson, UA

Carlo Geraci
Institut Jean Nicod

Everyone in the pickup, it’s linguistics time.

Language Backgrounds

Kaqchikel

There are 32 Mayan languages spoken today by over 6 million people in Mexico, Guatemala, Belize, Honduras, and in diaspora communities.

- Kaqchikel, which belongs to the Eastern Branch Mayan languages, is spoken by more than 600,000 in the Western Highlands of Guatemala.

- Kaqchikel, like all other spoken Mayan languages, are fairly well-documented, including dictionaries, grammars, and pedagogical materials.

- Work on gesture in Kaqchikel is very thin (though see Massarello 2023), and co-speech gesture is completely undocumented.


ermosa
Macuspana
Balancán
El Triunfo
Parque Nacional El Mirador
Rio Bravo Conservation Area
Belize
Hattieville
Belmopan
Parque Nacional Laguna del Tigre
Reserva de Biosfera Maya
Palenque
Tenosique
Tikal
San Ignacio
Yajalón
Piedras Negras
Parque Nacional Sierra Del Lacandón
Melchor de Mencos
Chilón
Ocosingo
Flores
Hopkins
Frontera Corozal
La Libertad
San Cristobal de las Casas
Las Cruces
Teopisca
Reserva de la Biósfera Montes Azules
Sayaxché
Poptún
Comitán
La Trinitaria
La Angostura
Playa Grande Ixcan
Puerto Barrios
Frontera Comalapa
Soloma
Cobán
Motozintla de Mendoza
Escuintla
Huehuetenango
Morales
Huixtla
Santa Cruz del Quiché
La Entrada
Zacapa
Tapachula
Quetzaltenango
Malacatán
Chiquimula
Santa Rosa de Copan
Coatepeque
Panajachel
Guatemala
Jalapa
Ayutla
Chimaltenango
Esquipulas
Mazatenango
Antigua Guatemala
Retalhuleu
Santa Lucia Cotzumalguapa
Escuintla
Jutiapa
Port of San Jose
Santa Ana
Ahuachapan
San Salvador

LENSEGUA

We follow Fox Tree and Rodriguez 2016 in distinguishing Indigenous and Non-Indigenous Central American Sign Languages (ICASL vs NICASL).

- LENSEGUA (Lengua de Señas de Guatemala) is a NICASL with an origin in
    - the missionary history of various regions of Guatemala, and
    - schools and hospitals run since 1945 by El Benemérito Comité Pro-Ciegos y Sordos (Rodriguez 2019).

LENSEGUA

There is a substantial amount of variation reported for LENSEGUA, though there are two major dialects, centered on Guatemala City and Quetzaltenango (E. Parks and J. Parks 2008).

- Despite this variation, a monolithic LENSEGUA has been recognized as an official language of Guatemala since 2020 (Decreto 3-2020).
- Before the passage of the language law, there had been efforts by the Asociación de Sordos de Guatemala (ASORGUA) to standardize LENSEGUA across the country (Rodriguez 2019).
- LENSEGUA and Indigenous sign languages are not mutually intelligible (Rodriguez 2019), which we can confirm from personal experience in various ways.

Highland Maya Sign Language(s?)

We use HMSL to refer to sign languages used in Indigenous Maya communities in Highland Guatemala.

- Fox Tree 2009 proposes an ICASL called *Meemul Tzij* based on fieldwork in the K'iche'-speaking town of Nahualá.
  - The language is proposed to be of widespread use
  - Of ancient origin
  - Primary language of the Indigenous deaf community
  - Historically used between hearing communities that do not share a spoken language
  - Used with elderly hearing people as they become deaf with age

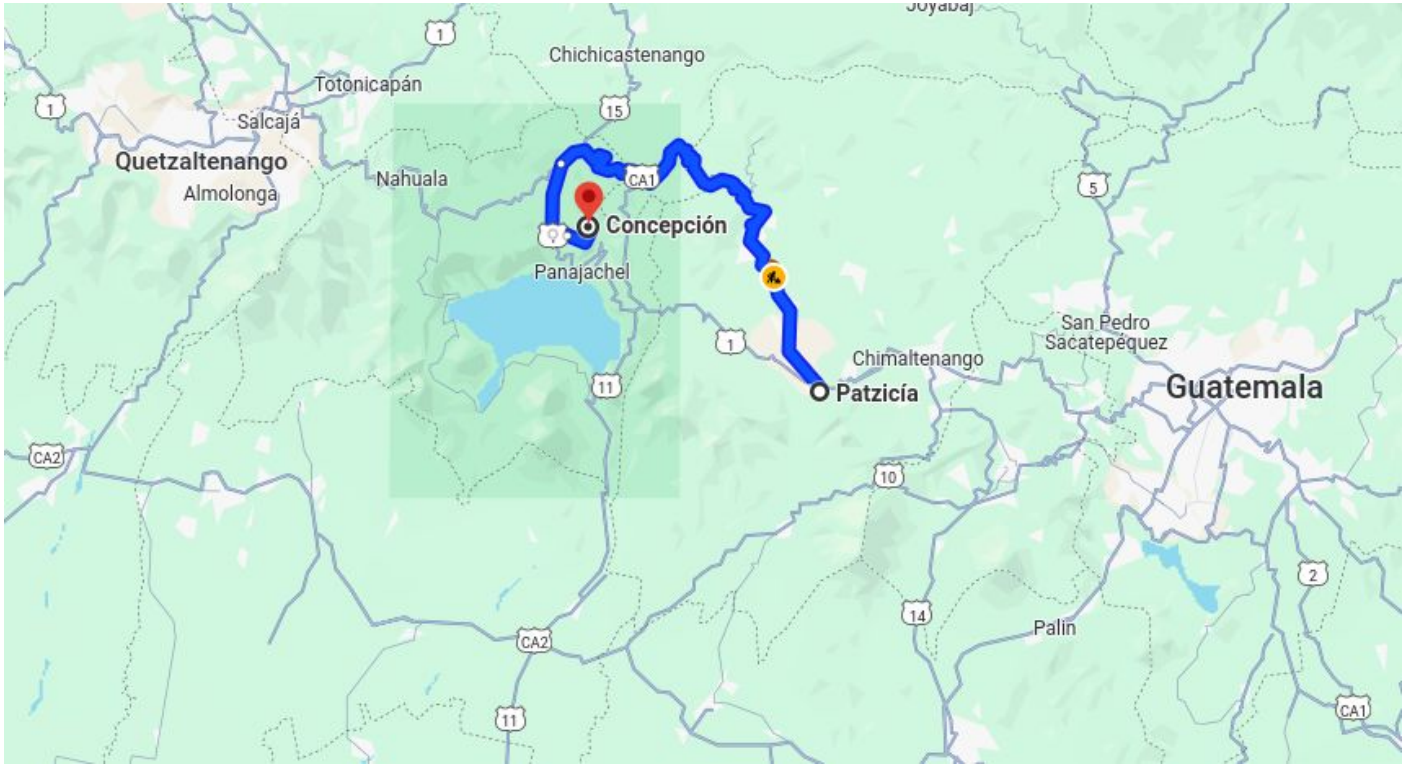
Highland Maya Sign Language(s?)

We are fairly skeptical of the strong version of the Meemul Tzij hypothesis, which is why we do not use that term, but…

- It is true that we see major similarities between the sign languages that we have encountered in various various villages (even across language regions)
- We do find evidence in classic Maya epigraphy for some kind of semiotic continuity
- We do seem to be able to distinguish something like village sign from what appear to be genuine cases of homesign.

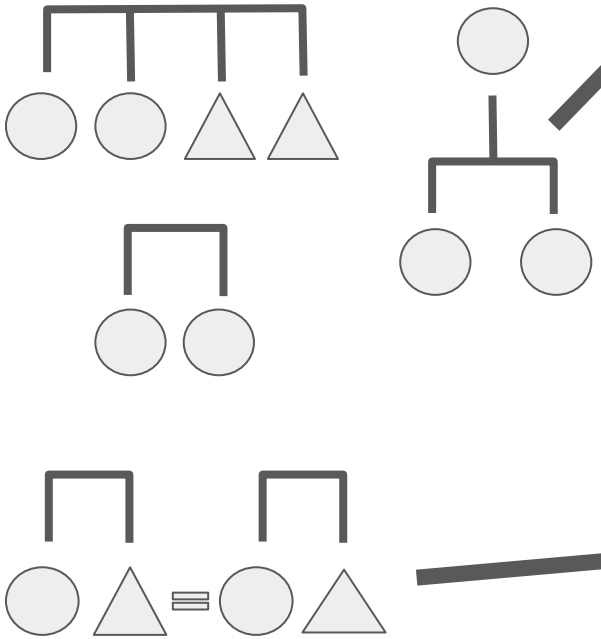
To discuss these issue it would help to have more geography and context for our work.

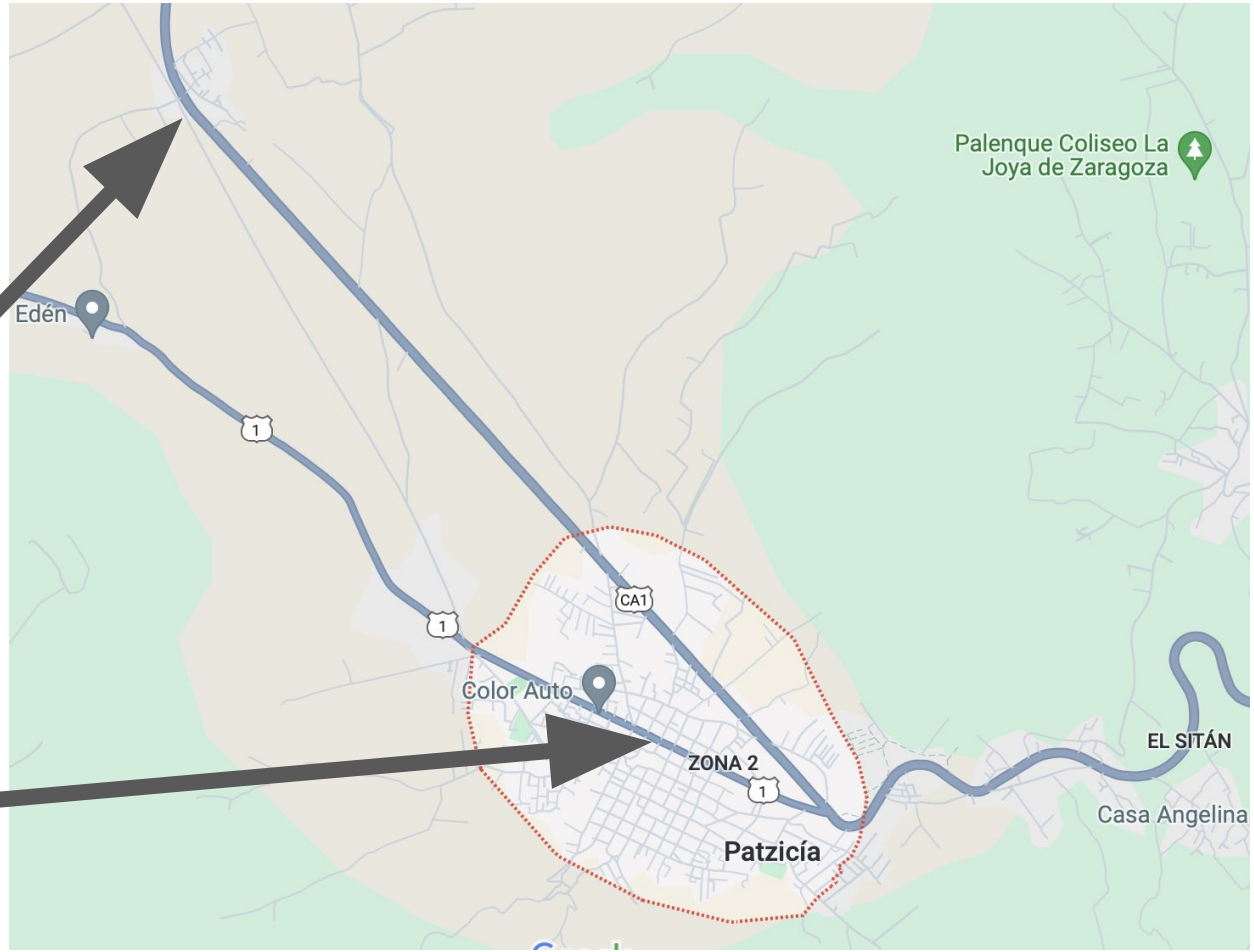
Two HMSL Communities: Patzicía and Concepción



Patzicía

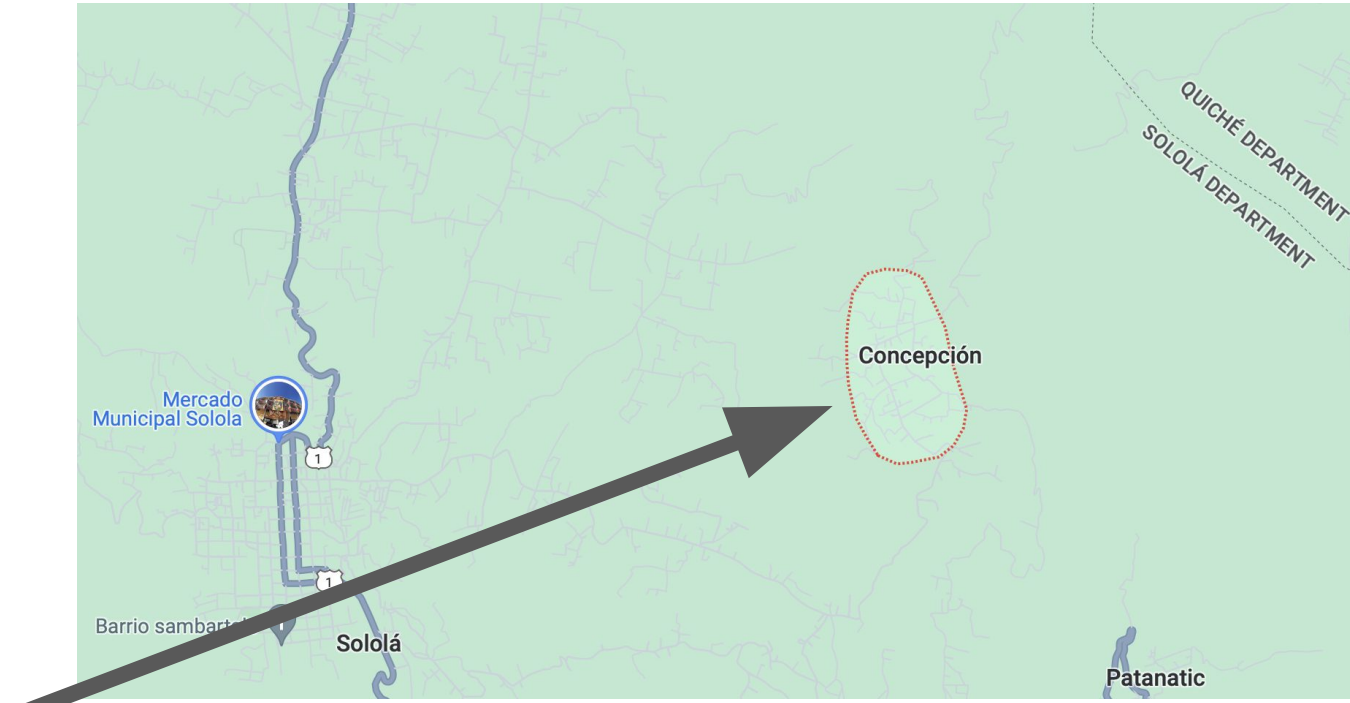
Kaqchikel town of 20,000

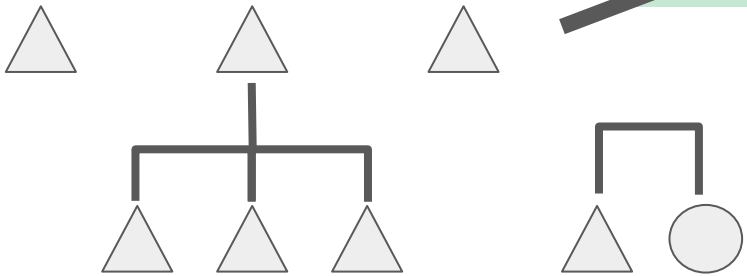




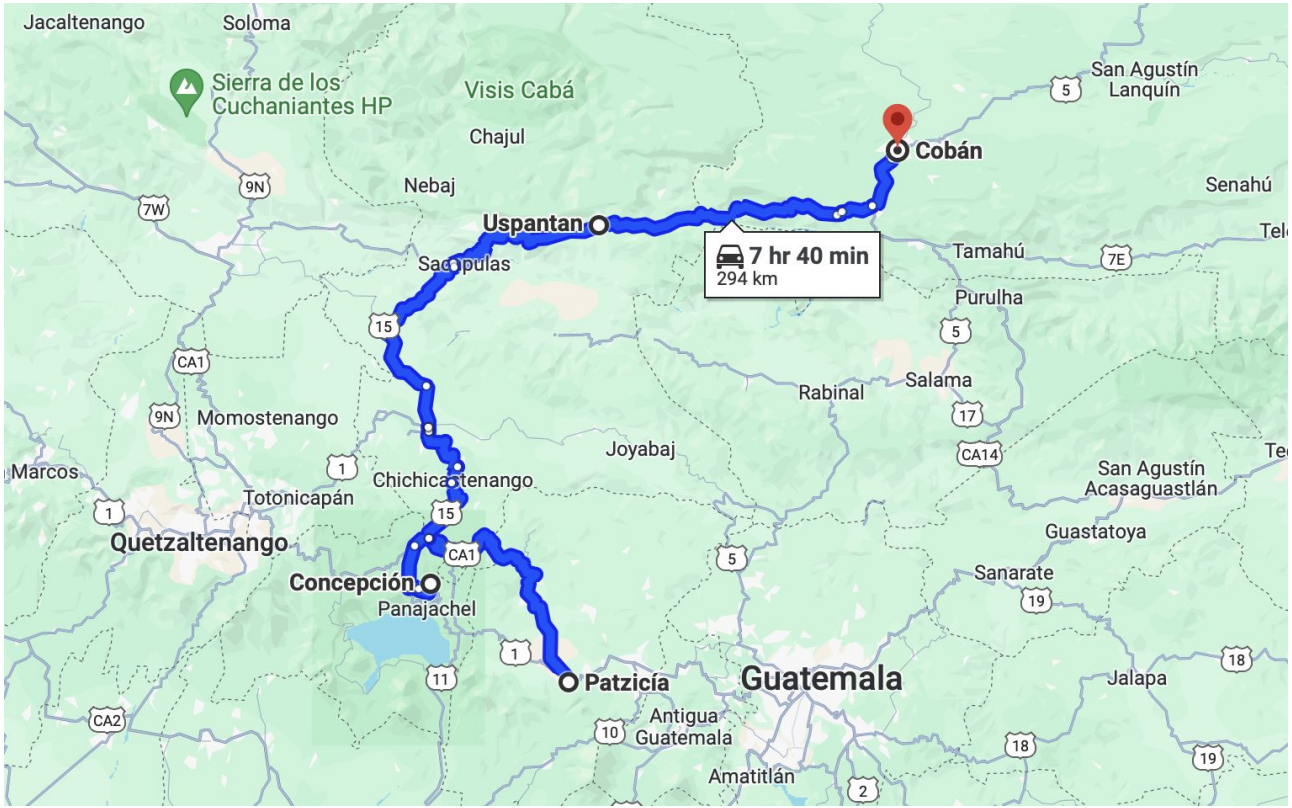
Concepción

Kaqchikel village of about 7000





HMSL Wider View



Uspantán and Cobán

Uspantán is a village of about 6500.

- We have worked with one deaf young man, as well as his father and brother who sign (one natively). A neighbor family has three deaf siblings (who moved away), and we have seen elderly gentlemen signing in the plaza.

Cobán is a city of 200,000 with a regional school for the deaf.

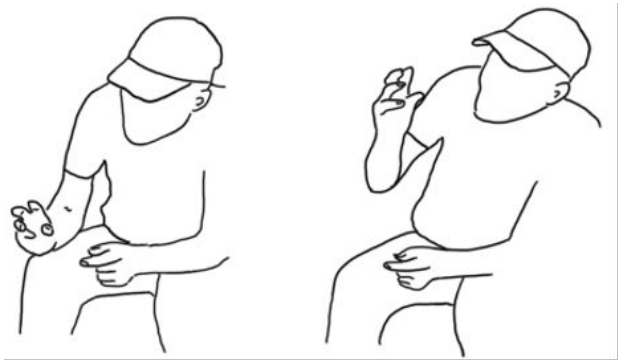
- We visited their sign language classroom, which has mostly indigenous students, who receive instruction in LENSEGUA.

Macro-impressions about HMSL(s)

While we do not yet know about mutual intelligibility, there are real similarities in signing across these locations (and matching what has been reported for, e.g., Nahualá (Fox Tree 2009).

- Most importantly, handshape classifiers:

Signer producing anaphoric DOG (open-B, palm in, La Esperanza)



CHILD (small) vs CHILD (big), Concepción

Measure Classifiers in Co-Speech Gesture

Importantly, we also find similar measurative classifiers in co-speech gesture across the Mayan world.

- Plants: Open-B, palm up
- Domesticated Quadrupeds: Open-B, palm in
- Humans: Open-B (or Claw-5), vertical, palm forward

Child (Small) Gesture

K’o jun k’o ruxajab’, y k’o manaq ruxajab’. To ri ak’wal ri k’o ruxajab’, nib’iyin paj paj paq paq paq rub’anon. Nib’iyin.

There is one with sandals and one without. So, the child with sandals walks going paj paj paq paq paq. She’s walking.

Child (Small) Gesture

la jun xtän chila’...
That one girl there…

(20240129_Esperanza_MMXX_VSX_VSX_annotations, 31-13-11)

Bimodal bilingual signer from La Esperanza

Plant Gesture

We also similar gestures in Classic Maya (200-900 AD) epigraphy, which suggests that these gesture systems are old and widespread throughout the Maya world.

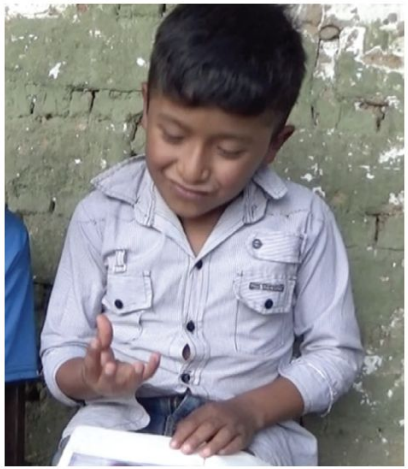
Young Maize God producing plant classifier (or scatter, see Gardner 2022), Kerr vase 3933

Macro-impressions about HMSL(s)

We also see overlap in vocabulary, both in terms of what we have elicited and is described in other Highland communities (e.g., Horton 2022, Fox Tree 2009).

describing an egg
(Uspantán, Uspanteko)

describing an egg,
(Patizicía, Kaqchikel)

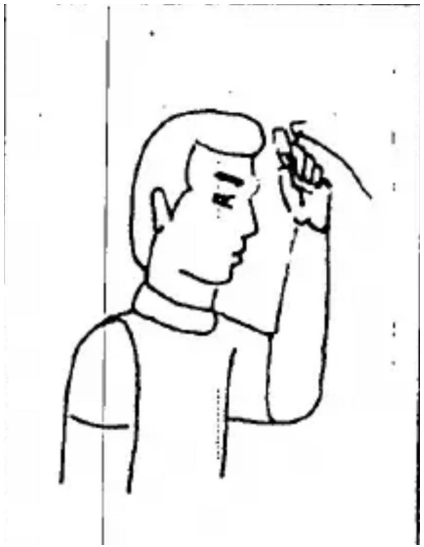


EXIST_SMALL
(Neb'aj, Ixil), Horton 2022)

Macro-impressions about HMSL(s)

signing “hat” in Patzicía

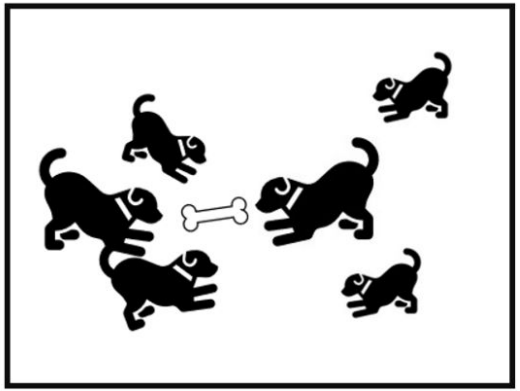
and in Concepción

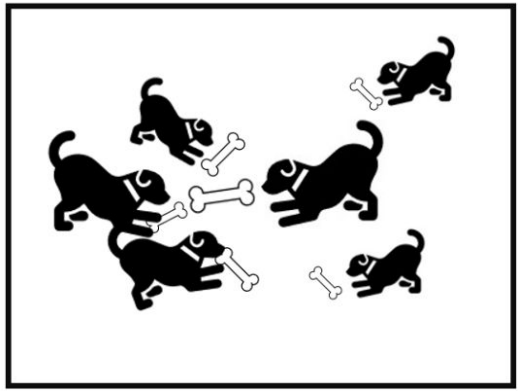


Compare “hat” in LENSEGUA (De León 2001)

Distributivity in Sign

We have noticed the use of two-hand alternating motion for signs involving distributive quantification in different communities.





Signing 1-EACH in Patzicia

Signing 1-EACH La Esperanza

Distributive Pluractional Co-Speech Gesture

Ja’ la wuj ru-tel-ela’ ru-b’an-on
FOC DEM paper E3s-carry-PLRC E3s-do-AP
That toilet paper is stacked. (lit. that paper’s form is repeatedly, distributively carried above.)

Macro-impressions on HMSL(s)

Let’s return to the Meemul Tzij hypothesis:

- The language is proposed to be of widespread use
- Of ancient origin
- Primary language of the Indigenous deaf community
- ~~Historically used between hearing communities that do not share a spoken language~~
- Used with elderly hearing people as they become deaf with age

Gesture Source Counter-hypothesis

Instead of the strong Meemul Tzij hypothesis, we think the following is more plausible and explains the same range of data:

- There is a pan-Mayan gesture system, with at least partially ancient roots and with a fair degree of conventionalization.

- Maya speakers are (more?) gesturally expressive (than speakers of standard English, e.g.)

- Highland Maya communities have very similar lifeways and material culture.

Gesture Source Counter-hypothesis

Under these assumptions, we might expect convergent evolution of sign languages (e.g., Okombo et al 1997), partially rooted in the gesture systems of the hearing community, to emerge in different villages with a substantial deaf population.

- This convergence would be supported by a certain amount of contact between villages.
  - Market days
  - Short term migration for work
  - Attendance at school
  - Marriage

Gesture Source Counter-hypothesis

We could even imagine a kind of bubbling, repeated florescence of HMSLs yielding a weak version of Meemul Tzij

- i.e., a family of fairly mutually intelligible Indigenous sign languages, with, if not ancient origins, ancient roots, used by socially integrated deaf people across the Highlands.

Gesture Source Counter-hypothesis

To determine the strength of this proposal we would need at least a few things, most importantly:

- Better understanding of co-speech gesture in various highland Maya communities.

- We would additionally like to have some kind of social network analysis to understand who signers are communicating with both at the village level and across the highlands.

We have started on the first, and today will present some initial results.

Pluractionals, positionals, and Ideophones in Kaqchikel

Gesture rich grammatical domains:

- *pluractional* refers to verbs or verb forms that denote predicates of events that cannot be satisfied by atomic events (Henderson 2012)
- *positional* refers to a special root class in Mayan languages denoting predicates of states describing, usually, the form or configuration of an object (Henderson 2019)
- *ideophone* refers to a distinguished class of words in a language that specialize in depicting sensory imagery (Dingemanse 2011: p. 25; 2012)

We focus on these domains because their use is often accompanied in Mayan by co-speech gesture (e.g., Pérez González 2012, Le Guen et al. 2020)

Pluractional

Kaqchikel has a large number of verbal pluractional affixes (e.g., Henderson 2012 does an extensive investigation of 3), which derive predicates of events that cannot be satisfied in single-event scenarios.

X-e'-in-chäp
CP-A3p-E1s-touch
I touched them.

X-e'-in-chap-acha'
CP-A3p-E1s-touch-PLRC
I touched them (repeatedly, furiously).

X-e'-in-chap-ala'
CP-A3p-E1s-touch-PLRC
I touched them individually.

X-e-chap-alöj
CP-A3p-touch-PLRC
They were touched (over time).

Pluractional with Gesture

To wakamin x-u-tz’am n-u-b’an nu-ch’oy-och’a’ la q’os che la ch’ich’
So now CP-E3s-grasp ICP-E3s-do E3s-cut-PLRC the weeds P DET metal
So now he started doing (pluractional) cutting the weeds with the metal.

Pluractional with Gesture

X-u-ya’ el pa ru-wi’. X-u-tel-ela’ r-i’. ee X-u-b’an el.
CP-E3s-give DIR P E3s-head. CP-E3s-carry-PLRC E3s-REFL ee CP-E3s-do DIR
Jun mama nim x-u-b’an el.
A big big CP-E3s-do DIR

She put them up on their heads. It stacked (pluractional) itself. Eeeee. It was done up. A big big one was done up.

Positional

Finally, Kaqchikel has a large number of positional roots. These are CVC roots that convey the form or configuration of an object. Basically, in Mayan, eloquent speak involves using these rather than the existential predicate.

ch'em "state of being unfinished"
Ch'em'-ël kan ru-samäj ri achin.
ch'em-NVP DIR E3s-work the man
The man's work was left unfinished.

ch'oq' "state of being loose and thus curved"
Choj ch'oq-öl x-qa-b'än che r-e ri k'an…
VERUM ch'oq'-NVP CP-E1p-do P E3s-DAT DET mecatl
We let the mecatl hang loose…

Positional with Gesture

Choj x-tzal-e’ kan ke re la ti ru-tapadera.
VERUM CP-lean-IV DIR thusly DEM DIM E3-cap
Truly it’s little cap leaned like this.

Ideophones

Finally, Kaqchikel has a large number of ideophone roots. These are CVC roots that depict sensory imagery. Many are sound-symbolic, but at the same time, they fit into the CVC root system and can be explicitly derived into other grammatical categories—i.e., they are fully conventionalized and not just iconic.

witz’ witz’ witz’ x-u-b’an ri ch’oy.
Squeak squeak squeak CP-E3s-do the rat
The rat went squeak squeak squeak.

Yalan y-e-witz’-itz’.
Very ICP-A3s-squeak-PLRC
They are squeaking a lot.

Ideophone with Gesture

Mama’ ab’äj k’o. Wakamin ruk’amon pe ri xaq awän.
There is a big stone. Now she has brought here the cornstalk.

Ja t-u-b’oj-b’a’. B’oj B’oj.
EMP ASP-E3s-smack-TR smack smack
She smacks it, smack smack.

Po ja petenäq rik’in royowal yicha’ yin. Jatub’ojb’a la mama’ ab’äj.
But truly she has come with anger I would say. She smacks the big stone.

Methodology

Petatillo Chan (e.g., Le Guen et al. 2020) has developed a set of 43 videos likely to elicit ideophones, positionals, and their pluractional derivations.

- We played these videos for three populations, deaf signers, hearing bimodal multilinguals, and monomodal multilinguals.

- Participants were asked to describe the scenes as if for a person not watching.

- We did not specifically ask that participants give us particular gestures or particular constructions, but they knew generally that we are investigating gesture and sign.

Methodology

We have annotated videos for two bimodal multilinguals and two monomodal multilinguals, which we will present today.

- We annotated for 5 different linguistic constructions, or strategies: Plain, Pluractional, Ideophone, Reduplication, Demonstration.

Reduplication

Majani’ tz’apäl kan. Nukajij kan, nukajij kan, po man tz’apäl ta ütz.
It’s not yet closed. She hit it to remain, She hit it to remain, but it’s not closed good.

Demonstrations

We also noted speakers doing what we want to call a *demonstrative* strategy (thinking along the lines of Davidson 2015).

- We are thinking of these performative constructions (e.g., Davidson 2015:34)

  The flowers bloomed like [gesture of hands]

  Bob saw the spider and was like “ahh! [in a scared voice].”

Demonstrations

In Kaqchikel we have classified three kinds of constructions as demonstratives in this sense.

- Clear cases of performance
- Super bleached verbs like ya’ or b’an with ke re’ paired with a gesture.
    - Xub’an ke re’...
      S/he did like…
    - Xuya’ ke re’…
      S/he gave like…
- Cases were there is no verb at all and a gesture substitutes.

Performance

Kan nsik’in la ak’wal . Eeeeee. Xq’ax qa.
The child truly screamed. Eeeeee. She crossed over.

Demonstration with Bleached Verb and “Like”

K’o la rumesa, k’a ri k’o jun fruta, k’e ri…k’o jun ti coco. K’a ri xuya’ rumachit.
K’e re k’e re x-u-b’an chi r-ij.
DEM DEM CP-E3s-do P E3s-back
Like this, like this she did at it’s back.

Demonstration with No Verb

K’a ri xuya’ apo k’e re. K’a ri [gesture]
Then, she gave it over like this. Then [gesture]

Methodology

We have annotated videos for two bimodal multilinguals and two monomodal multilinguals, which we will present today.

- We annotated for 5 different linguistic constructions, or strategies: Plain, Pluractional, Ideophone, Reduplication, Demonstration.

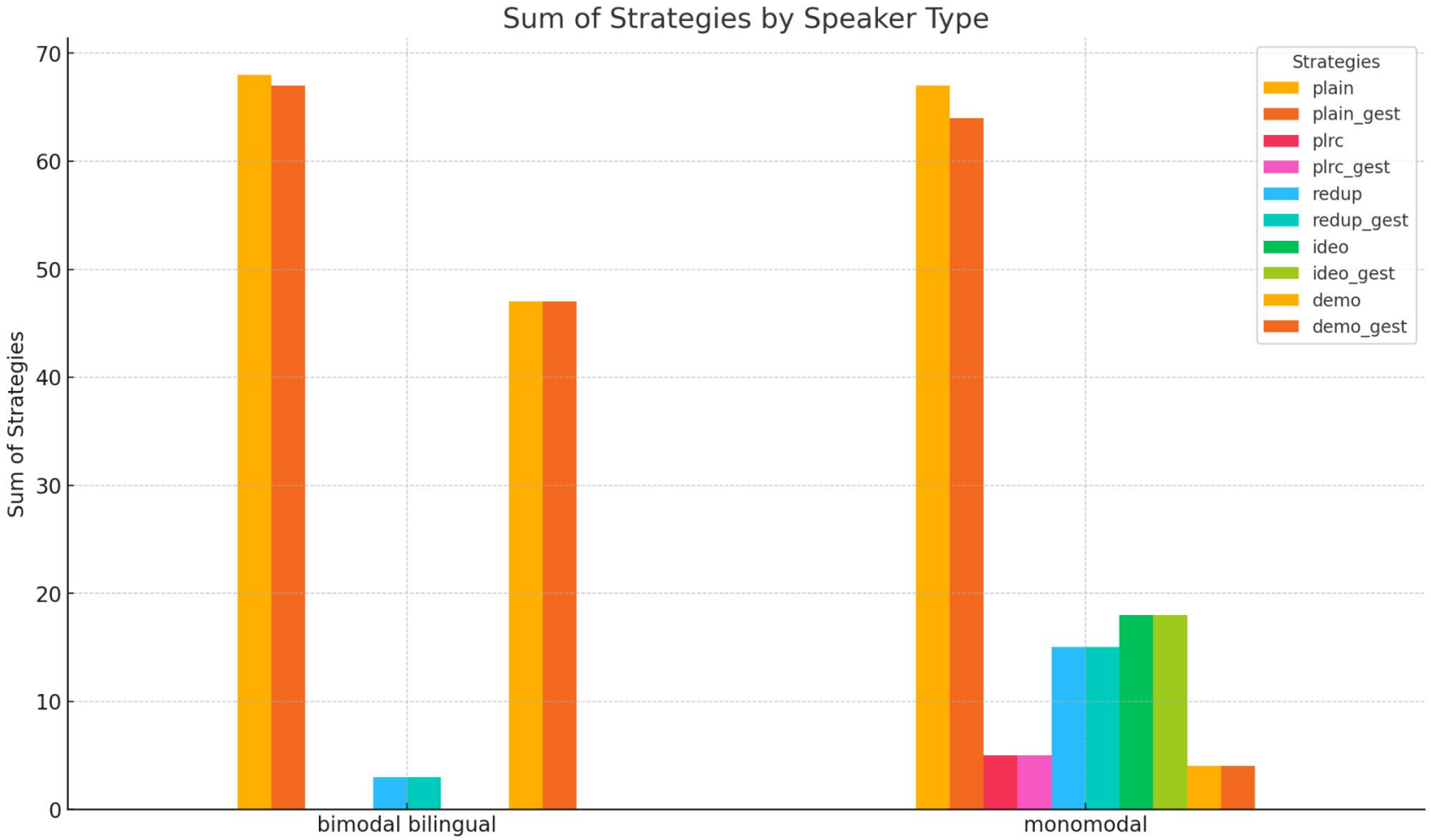
- Anytime a speaker used any one of these strategies in a response for an item, it was annotated, but we did not keep track of counts.

- We also annotated whether a gesture was used as a co-speech gesture with strategy in question.

Major Questions

- What kind of overlap is there between co-speech gesture and sign?
- Can we detect any mediating effects of bimodal multilinguals—i.e., do we seem them gesturing in any “transitional” way?
- Do bimodal multilinguals speak differently than monomodal multilinguals?

We still have a lot of annotating to do to answer the first, but we have some preliminary results on the 2nd and 3rd.


Sum of Strategies by Speaker Type
Sum of Strategies
0
10
20
30
40
50
60
70
bimodal bilingual
monomodal
Strategies
plain
plain_gest
plrc
plrc_gest
redup
redup_gest
ideo
ideo_gest
demo
demo_gest

Conclusions

Here are what I think the main takeaways are:

- Highland Maya Sign Language(s) exist, are distinct from non-Indigenous Central American Sign Languages like LENSEGUA.

- A weak form of what we have called the Meemul Tzij hypothesis is tenable, but we need to know more, especially about social networks.

- Enriched gesture, via sign, might be replacing highly depictive language (i.e., ideophones and pluractionals) in the speech of bimodal multilinguals.
    - Or, perhaps these speakers full on code-switching, i.e., they are integrating sign language into their Kaqchikel production.
    - Whichever, they are clearly doing something different than participants who are monomodal.

Points for Discussion

- How should we go about distinguishing strong and weak forms of the Meemul Tzij hypothesis?
- How should we think about separating gesture and sign in emerging sign languages (or continually re-emerging sign languages)?
- In bimodal bilinguals, how can we distinguish gesture versus code-blending with sign?
- What does it tell us about the semantics of pluactionals and ideophones such that their meaning seems eminently replaceable by demonstration?