Conceptual metaphor: Space - Time

- Everyday abstraction and Spatial construals of Time: The role of language
- The psychological reality of Time construals: Priming experiments
- Universals, and cultural variations: The Aymara and the Yupno way
- Exploring neural basis: an fMRI study
Aymara people
Where do Aymara people live?
South American Andes Highlands
Aymara: Expressions regarding the past

**ancha nayra pachana**

Morpheme by morpheme gloss:

- *ancha*  
  a lot

- *nayra*  
  eye, sight, front

- *pacha*  
  time

- *-na*  
  in, on, at

Literal translation:

A lot eye/front time-at

Meaning:

(At a) long time ago
Aymara: Expressions regarding the future

**akata q”iparu**

Morpheme by morpheme gloss:

- *aka*  here, this
- *-ta*  from
- *q”ipa*  back, behind
- *-ru*  to, towards

Literal translation:

From now on

Meaning:

From now on
Spatial construals of time in Aymara

The crucial question

- Lexical and metaphorical evidence of
  - Time AS Unidimensional Space metaphor
- But …

In Aymara, is the underlying mapping Ego-RP or Time-RP?
Spatial construals of time in Aymara

The crucial question

- If the mapping is **Time-RP** then it simply operates like our “ahead” (front/Earlier – back/Later)
  - Many “exotic” languages thought to be counter-universal turned out to be like English, after the Time-RP distinction (Moore, 1999; Núñez & Sweetser, 2006).

- If the mapping is indeed **Ego-RP** then Aymara would be a counterexample to the universality of Ego orientation!
Spatial construals of time in Aymara
How to decide?

- Because of grammatical constraints in Aymara there is no way to answer to the previous questions with purely linguistic evidence (e.g., grammatical, lexical, …) (Hardmann, 2001)

- There are no clear and unambiguous cases such as
  - “The week ahead of us” (meaning future in front of EGO rather than of another time)

Spontaneous gestures?
What can we learn from Gestures?

- A detailed study of Gestures can help answering the previous questions
  - Gesture-speech co-production is universal
  - Astonishingly close speech-gesture co-production
  - Provide rich information about deixis, manner, and RPs (often complementary to speech)
  - Preservation and construction of semantics (iconics and metaphorical gestures): built-in
... más allá antes ...
“From last year to this year”
“From last year to this year”
And much more …

Nayra mara … antiguo
[old]

Aka maran
[this year]

Q”’ipa timpun
[Future times]
And much more …

Last year’s nayra sata
taypi sata q”ipa sata
Micro movements ... with transitive relations (order)

nayra sata
taypi sata
q'ipa sata
Saggital Past gestures

Aymara participants producing sagittal past gestures (n=15)

Language Proficiency
- Past-Front only
- Past-Behind at least once

Núñez & Sweetser, 2006

Fisher’s, $p = 0.035$
Time As Unidimensional Space: Aymara Ego-RP mapping

Source Domain
1-D Space

Target Domain
Time

*front of ego*

*behind ego*

*ego’s location*

*future*

*past*

*present*

Converging lexical, metaphorical, AND gestural evidence
A counter-universal!

GEO Wissen

Jornal do Brasil

The New York Times

Does This Mean People Turned Off, Tuned Out and Dropped In?

Pour la Science

Science

Taipei Times

Pacific Preserve

BBC World
Aymara: Why this pattern?

- Overemphasis on visual perception as source of knowledge
- Strong use of evidentials, including in *Castellano Andino*
- “Knowing is seeing”
  - Past is known ➔ “visible”
  - Future is unknown ➔ “out of the visual field”
A case of a dying metaphor?

Aymara participants producing only sagittal past/future gestures (n=10)

Fisher’s, $p = 0.024$

Núñez, Neumann, & Mamani, 1997
Núñez & Sweetser, 2006
Spatial construals of time: Another crucial question

- Can the source domain (space) have other forms?
- Other frames of reference?
  - Not Ego-centered?
  - Not based on moving sequences?
- ... Geo-centric?
  - Yes: People from the Yupno valley
    - (Núñez, Cooperrider, and Wassmann, submitted)
- Some lexical hints