Experimental Design for Field Linguists

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A Changing Field

• More linguists using experimental methods
• Findings applied to linguistic theory
• Developing an integrated theory of language
A New Objective

• Field work standards

• Experimental standards

• Goal: Maintain standards from both traditions while collecting quantitative data in the field
Plan for Today

• General considerations for linguistic experimentation in the field

• Specific techniques and lessons learned from our processing work in two Mayan languages
SOME GENERAL PRINCIPLES
General Principles

• Manage your resources and those of your host community
  – No fishing expeditions: formulate a testable hypothesis with clear implications
  – Have a back-up plan
  – Make sure there is no way of answering your question without experimenting in the field
General Principles

• Expect testing conditions to be maximally different from familiar experimental settings
  – Be personally familiar with the place where the experiment will be run
  – Be personally familiar with the community
    • Experience with outsiders
    • Approval from community leaders
    • Cultural norms with regard to payment
General Principles

• Be prepared for population variability
  – Assess experience
    • Education, literacy, multilingualism
    • Familiarity with testing equipment
  – Assess dialectal variation
  – Collect demographic information in order to assess the extent of variance
General Principles

• Experimenting is time consuming, field work is time consuming, experimenting in the field is extra time consuming
  – Run a pilot
  – Budget time for being a gracious guest
  – Budget time for the unexpected
General Principles

• Be prepared to articulate the goals of your project to the host community
  – Speakers are not vending machines
  – Communicate to participants what their participation involves
  – Engage hosts in a conversation about potential beneficial outcomes for their community
TECHNIQUES FOR EXPERIMENTAL WORK IN THE FIELD
Comprehension Research: A Common Paradigm

• Self-paced reading (SPR), an established tool

  Just et al. 1982, Mitchell 2004

• Timing is regular except for areas of difficulty

• How can one extend this paradigm to populations that do not read?
Non-Reading Populations

• Potential issues regarding literacy
  – A language that is exclusively spoken
  – General illiteracy
  – Literacy only in culturally dominant language
Possible Solutions

• Taking lessons from researchers for whom reading is irrelevant, inappropriate, or an unwelcome confound
  – Sign language research
  – Child language acquisition research
  – Research on clinical populations
  – Phonological investigations
Another Common Paradigm in Comprehension

• Sentence-picture matching (SPM), also well-established

• Present acoustic stimuli and record response time for a stimulus-to-picture matching task

• Common in the fields of aphasiology and child language acquisition
Comparing SPR and SPM

• An unknown: Do SPR and SPM produce comparable results?
• Test case: Relative clause processing
Relative Clause Processing

• Subject relatives are easier to process
  
  SPR: Traxler et al. 2002; ERP: King & Kutas 1995; 
  PET: Stromswold et al. 1996; fMRI: Just et al. 1996; 
  Eye-tracking: Traxler et al. 2002...

• Cross-linguistic advantage of subject relatives
  
  Dutch: Frazier 1987; German: Mecklinger et al. 1995; 
  Korean: Kwon et al. 2006; Russian: Polinsky 2011...
Comparing SPR and SPM: Russian

• Subject preference in the processing of relative clauses in Russian
  Levy et al. 2007, submitted; Polinsky 2011, 2012

• Subject and object RCs can have the same word order

  \[ NP_i \ [ \text{which}_{\text{NOM}} \ i \ \text{Verb} \ NP_{\text{ACC}}] = \text{Subject Relative} \]
  \[ NP_i \ [ \text{which}_{\text{ACC}} \ i \ \text{Verb} \ NP_{\text{NOM}}] = \text{Object Relative} \]
Russian: Self-paced Reading

<table>
<thead>
<tr>
<th>Time in ms</th>
<th>Subject</th>
<th>Object</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6290</td>
<td>6355</td>
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</table>

Polinsky 2012; Polinsky & Fedorova in prep.
Russian: Sentence-Picture Matching

- Subjects see two pictures on computer screen followed by a sound file
Russian: Sentence-Picture Matching

Polinsky & Fedorova in prep.
Proof of principle: We have shown comparable results from research using different paradigms

Polinsky 2011, Polinsky & Fedorova in prep.

Subject preference, again: Russian illustrates a well-documented processing preference for subject extraction
Where we are going...

• Russian confirms a well-documented processing preference for subject extraction
• Is the subject preference due to grammatical function preference or case hierarchy?
  – Subject > Object > ....
  – Nominative gap > Accusative gap > ...
Where we are going...

- Is the subject preference due to **grammatical function** or **case**?

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<thead>
<tr>
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<tbody>
<tr>
<td>SUBJECT</td>
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<td></td>
</tr>
<tr>
<td>OBJECT</td>
<td></td>
<td><strong>N/A</strong></td>
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Where we are going...

- Is the subject preference due to grammatical function or case?

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<td>ACC</td>
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- In accusative languages, case aligns with grammatical role.
Where we are going...

- Is the subject preference due to **grammatical function** or **case**?

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<tbody>
<tr>
<td>SUBJECT</td>
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<td>ABS</td>
</tr>
<tr>
<td>OBJECT</td>
<td>ABS</td>
<td>N/A</td>
</tr>
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- In ergative languages, grammatical functions and cases **align differently**.
Where we are going...

• Is the subject preference due to grammatical function or case?
• Investigate the processing of relative clauses in an ergative system:
  – Ch’ol, Q’anjob’al (Mayan)
  – Avar (NE Caucasian)
  – Niuean, Tongan (Austronesian)
Mayan Languages
Ch’ol (aka Chol)

• VOS, morphologically ergative language
• Grammatical relations encoded via agreement

(1) Ta’ i-japä-Ø kajpej jiñi x’ixik.
   ASP 3ERG-drink-3ABS coffee the woman
   ‘The woman drank coffee.’

(2) Ta’ wäyi-Ø jiñi x’ixik
   ASP sleep-3ABS the woman
   ‘The woman slept.’

• All core arguments freely relativize with a gap
Subject Relatives

(3) Ta’ y-ilä-yety jiñi x’ixik
ASP 3ERG-see-2ABS the woman
‘The woman saw you.’

(4) Ta’ juli jiñi x’ixik, [ ta’-bä y-ilä-yety ]
ASP arrive the woman ASP-REL 3ERG-see-2ABS
‘The woman [who saw you] arrived.’
(5) Ta’ aw-ilä-∅ jiñi x’ixik
ASP 2ERG-see-3ABS the woman
‘You saw the woman.’

(6) Ta’ juli jiñi x’ixikᵢ [ ta’-bä aw-ilä-∅ ___i ]
ASP arrive the woman ASP-REL 2ERG-see-3ABS
‘The woman [who you saw] arrived.’
Ambiguity

• Ambiguity results when both DPs are third person:

\[
\begin{align*}
(7) \text{Ta’ juli } & \text{jĩnĩ }\text{x’ixik}_{\text{subj/obj}} \text{[ } \text{ta’-b̄ } \text{i-tsäk’ā-∅ } \{ \text{t}_{\text{obj}} \} \text{jĩnĩ }\text{wiñik } \{ \text{t}_{\text{subj}} \} \text{ ]} \\
& \text{ASP arrive the woman } \quad \text{ASP-REL 3ERG-cure-3ABS the man}
\end{align*}
\]

‘I saw the woman [who cured the man ].’ (= Subject relative)
‘I saw the woman [who the man cured ].’ (= Object relative)

Because both DPs begin post-verbally, and no case is marked on nouns, it is possible to interpret the gap in either subject or object position.
Sentence-Picture Matching

• Participants hear the ambiguous relative clause
  – ... choose the image that corresponds
  – ... indicate their choice with a binary button box
Ch’ol: Preliminary Results,
Percentage interpreted as subject RCs
(monolingual Chol speakers)

Percent Subject Interpretation

- Object: 12%
- Subject: 79%
- Ambiguous: 71%

Coon et al. in prep.
Ch’ol: Preliminary Results,
Response Time
(for clauses in perfective aspect)

Coon et al. in prep.

<table>
<thead>
<tr>
<th></th>
<th>Time in ms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject</td>
<td>4880</td>
</tr>
<tr>
<td>Object</td>
<td>6470</td>
</tr>
</tbody>
</table>

*
Preliminary Results

- An ergative language, Ch’ol still shows subject preference in the processing of relative clauses
- Similar processing results for Q’anjob’al (not presented here)
Taking Stock

• New linguistic results:
  – Subject preference in a head-initial ergative language
  – Grammatical function matters in relativization

• New methodological proposal:
  – Re-appropriating well-established paradigms in experimental fieldwork (picture matching)

• Some general tips for experimenting in the field:
  – Get creative and stay flexible
  – Be prepared for a significant time investment
  – Plan in advance as much as possible
Thank you * Wokox awälä’ * Yuj wal tyoxh
Acknowledgments

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  – Pedro Gutiérrez Sánchez
  – All participants in the experiment
  – Universidad Intercultural de Tabasco students & staff
Acknowledgments

• Q’anjob’al:
  – María Pedro and Diego Adalberto
  – Asociación de Mujeres Eulalenses para el Desarrollo Integral Pixan Konob (AMEDIPK)
  – Municipality of Santa Eulalia, Huehuetenango
  – Daniel Pedro Mateo (Q’anjob’al artist)
  – All participants in the experiment
References


## Contexts of relativization in Q’anjob’al

<table>
<thead>
<tr>
<th>Verb types</th>
<th>Prog (=Animacy)</th>
<th>Prog (non=animacy)</th>
<th>Com(=animacy)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RTVs</td>
<td>3 (ambiguous)</td>
<td>8 (unambiguous)</td>
<td>7 (unambiguous)</td>
</tr>
<tr>
<td>DTVs</td>
<td>7 (ambiguous)</td>
<td>----</td>
<td>6 (unambiguous)</td>
</tr>
<tr>
<td>Unaccusatives</td>
<td>6 (unambiguous)</td>
<td>----</td>
<td>7 (unambiguous)</td>
</tr>
<tr>
<td>Unergatives</td>
<td>5 (unambiguous)</td>
<td>----</td>
<td>6 (unambiguous)</td>
</tr>
<tr>
<td>Positionals</td>
<td>4 (unambiguous)</td>
<td></td>
<td>4 (unambiguous)</td>
</tr>
<tr>
<td>Fillers (198)</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Total</td>
<td>25</td>
<td>8</td>
<td>30</td>
</tr>
</tbody>
</table>
• Processing of relative clauses in Q’anjob’al
  – VSO and ergative language
  – Ambiguity in the progressive *lanan*

• B’aytalil ay no’ wakax [lanan-Ø s-tek’-on no’ chej]?
  where exist the cow [ASP-3ABS 3ERG-kick-AF the horse]
  ‘Where is the cow that is kicking the horse?’
  ‘Where is the horse that is kicking the cow?’