ERGATIVITY UNDER THE LENS:
EXPERIMENTAL AND THEORETICAL SYNTAX

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SETTING THE STAGE
TWO SIDES OF SUBJECT PREFERENCE

• Subjects are privileged in a number of syntactic processes and in co-reference across clauses

• Subject gaps in long-distance dependencies are interpreted more accurately and faster than other types of gaps
Two sides of subject preference

• Subjects are privileged in a number of syntactic processes and in co-reference across clauses
  – The subject status of the antecedent matters

• Subject gaps in long-distance dependencies are interpreted more accurately and faster than other types of gaps
  – The subject status of the gap matters
Two sides of subject preference

- Subjects are privileged in a number of syntactic processes and in co-reference across clauses
  - The subject status of the antecedent matters

- Subject gaps in long-distance dependencies are interpreted more accurately and faster than other types of gaps
  - The subject status of the gap matters
The Accessibility Hierarchy: Subject gaps are special

Keenan & Comrie (1977, 1979)
THE ACCESSIBILITY HIERARCHY: RELATIVIZATION

Malagasy

✓

✗
THE ACCESSIBILITY HIERARCHY: RELATIVIZATION

Kinyarwanda, Welsh
THE ACCESSIBILITY HIERARCHY: RELATIVIZATION

North Frisian

✓ ✓

✗
THE ACCESSIBILITY HIERARCHY: RELATIVIZATION

subject → object → indirect object → oblique object → possessor → object of comparison

English
Does this preference depend on alignment?

• Most data concerning subject preference are from nominative-accusative languages
ALIGNMENT

Accusative alignment
ALIGNMENT

Accusative alignment

Ergative alignment
Mnemonics

Absolute
Subject

Ergative

Absolute
Object
The ergative NP has typical properties of a syntactic subject (Anderson 1976; 1982, and much subsequent literature)
## Signs of Subjects

<table>
<thead>
<tr>
<th></th>
<th>Nom S</th>
<th>Erg S</th>
<th>Obj</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tail of control chain</td>
<td>yes</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>Target of raising</td>
<td>yes</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>C-commanding binder (anaphors, depictives)</td>
<td>yes</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>Preferred argument for deletion under coordination</td>
<td>yes</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>Preferred target of A-bar movement</td>
<td>yes</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>Preferred gap position under A-bar movement</td>
<td>yes</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>Subject to <em>that</em>-trace effect</td>
<td>yes</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>Target of anti-agreement under A-bar movement</td>
<td>yes</td>
<td>yes</td>
<td>no</td>
</tr>
</tbody>
</table>
## Signs of Subjects

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<tbody>
<tr>
<td>Induces superiority violations</td>
<td>no</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Preferred argument in idiom formation <em>(the shit hit the fan vs. buy the farm)</em></td>
<td>no</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Undergoes noun incorporation</td>
<td>no</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Preferred argument for floating/stranding quantifiers</td>
<td>no</td>
<td>no</td>
<td>yes</td>
</tr>
</tbody>
</table>
SO ERG IS SYNTACTIC SUBJECT...

• It should be high on the Accessibility Hierarchy which accounts for relative clause formation

• *the cat [that ___ chased the dog]*
  subject gap

• *the cat [that the dog chased ___]*
  object gap
However...

• Unlike subjects in nominative-accusative languages, the ergative DP is often inaccessible to relativization, topicalization, and wh-question formation (A-bar movement)

• Syntactic ergativity: inaccessibility of the ergative NP to A-bar movement
SYNTACTIC ERGATIVITY

• Syntactic ergativity: inaccessibility of the ergative NP to A-bar movement
• Syntactic ergativity is found in a large number of ergative languages
EXAMPLE: TONGAN CONTROL

Na’e feinga ‘e Sione [ke alu ‘a$ ki ai]
PAST try ERG S COMP go ABS there
‘Sione tried to go there.’

Na’e feinga ‘e Sione [ke ‘ave ‘e$ ‘a Mele ki ai]
PAST try ERG S COMP take ERG ABS M there
‘Sione tried to take Mele there.’

*Na’e feinga ‘e Sione [ke ‘ave ‘e Mele ‘a$ ki ai]
PAST try ERG S COMP take ERG M ABS there
(‘Sione tried to be taken there by Mele.’)
**Example: Tongan control**

Na’e feinga ‘e Sione [ke alu ‘a$ $ki ai]
PAST try ERG S COMP go ABS there

‘Sione tried to go there.’

Na’e feinga ‘e Sione [ke ‘ave ‘e Mele ‘a$ $ki ai]
PAST try ERG S COMP take ERG ABS M there

‘Sione tried to take Mele there.’

*Na’e feinga ‘e Sione [ke ‘ave ‘e Mele ‘a$ $ki ai]*
PAST try ERG S COMP take ERG M ABS there

(‘Sione tried to be taken there by Mele.’)

*object*
ERGATIVE LOOKS LIKE SUBJECT; HOWEVER...

Relativization of ABS Subject with a gap is OK:
\[
\text{Det} \quad \text{woman} \quad \text{PAST} \quad \text{go} \quad \text{to} \quad \text{Tonga}
\]
\['\text{the woman who went to Tonga}'\]

Relativization of ABS object with a gap is OK:
\[
\text{Det} \quad \text{woman} \quad \text{PRES} \quad \text{love} \quad \text{ERG} \quad \text{S}
\]
\['\text{the woman whom Sione loves}'\]

Relativization of ERG subject with a gap is impossible:
\[
\text{Det} \quad \text{woman} \quad \text{PRES} \quad \text{RP} \quad \text{love} \quad \text{ABS} \quad \text{S}
\]
\['\text{the woman who loves Sione}'\]
WORKAROUND WAYS

• Syntactic ergativity is constant
• The way languages work around syntactic ergativity for forming relative clauses or wh-questions varies
  – Antipassive
  – Anti-agreement
  – Nominalizations
  – Resumption
SYNTACTIC ERGATIVITY

• WALS: 32 ergative languages, of which 5 allow the relativization of the ergative NP; they belong to two language families:
  – Nakh-Dagestanian: Hunzib, Ingush, Lezgian
  – Pama-Nyungan: Ngiyambaa, Pitjantjatjara

• If we add Basque and Georgian, we get 7 languages (out of 34) that have the relativization of the ergative NP
ERGATIVE LANGUAGES WITH AND WITHOUT EXTRACTION OF THE ERGATIVE

- Ergative Extracts
- Ergative Does Not Extract

27

7
A paradox

• Structural dominance: the ergative argument is structurally superior to the absolutive

• Syntactic ergativity: the ergative argument cannot undergo A-bar movement leaving a gap at the base position
WHY?

Syntactic explanations
  Comp-trace analysis
  Freezing analysis
  Phase-based analysis
  (Coon et al. 2014)
WHY?

Syntactic explanations
  Comp-trace analysis
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WHY?

• Syntactic explanations (Polinsky 2016)
  – Comp-trace analysis
  – Freezing analysis
  – Phase-based analysis (Coon et al. 2014)

• Today: Processing explanations
OUTLINE

• Subject preference vs. case effects
• Processing studies: Avar and Niuean
• Looking for clean subject preference
• Conclusions and outstanding questions
SUBJECT PREFERENCE AND CASE EFFECTS
PROCESSING HYPOTHESIS

• Maybe ERG gaps are more difficult to process than ABS object gaps...

• If so, languages without syntactic ergativity would show difficulty in the processing of ergative gaps

• And syntactic ergativity could be considered an extension of the otherwise soft constraint (cf. Hawkins 2004, 2014)
**PROCESSING HYPOTHESIS**

The Processing Account:

Syntactic ergativity is the grammaticalization of a gradient processing constraint.

- **Morphologically Ergative**
  - More processing difficulty tolerated

- **Syntactically Ergative**
  - Less processing difficulty tolerated
The Processing Account:

Syntactic ergativity is the grammaticalization of a gradient processing constraint.

Morphologically Ergative

Avar, Niuean

More processing difficulty tolerated

Syntactically Ergative

Tongan, Dyirbal

Less processing difficulty tolerated
HOW TO DETERMINE WHAT IS EASY AND WHAT IS DIFFICULT

• Experimental work on the processing of extracted DPs
  – If a particular structure is more difficult it imposes a heavier processing load
  – The processing load can be measured by reaction time, time of response, or neuro-imaging
RELATIVE CLAUSES

• Strong preference for subject relatives over object relatives

• The reporter
  
  [ who ( __ ) attacked the senator]    SR
  
  admitted the error.

  IS PREFERRED OVER

• The reporter
  
  [ who the senator attacked __ ]    OR
  
  admitted the error.
PROCESSING: SUBJECTS GAPS ARE EASIER THAN OBJECT GAPS

• English (King and Kutas 1995; Traxler et al. 2002, a.o.)
• German (Hemforth 1993; Mecklinger et al. 1995; Schlesewsky et al. 2000; Schwartz 2007, a.o.)
• Dutch (Frazier 1987, 1989)
• Japanese (Miyamoto & Nakamura 2003; Ishizuka et al. 2003)
• Russian (Levy et al. 2007; Fedorova 2006; Polinsky 2008, 2011, Clemens et al. 2015)
• Turkish (Demiral & Schlesewsky 2008; Özge et al. 2009)
THE NOMINATIVE TRAP

• All these languages are nominative-accusative
• In such languages, Subject ~ **Nominative**, and Object ~ **Accusative**
• Is the extraction is sensitive to grammatical function or to case form?
DEPENDENT AND INDEPENDENT CASES

Accusative $\rightarrow$ Nominative

DEPENDENT INDEPENDENT
ACC ?
MORPHOLOGICAL CUEING

e.g., Japanese, Korean
MORPHOLOGICAL CUEING

e.g., Japanese, Korean
PREDICTION

........... ACC ........... ?
PREDICTION

ACC --- (NOM) --- ✓
**The nominative trap:**

**Grammatical function and case in nominative-accusative languages work in sync**

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<tr>
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<tr>
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Effects of Grammatical Function and Morphological Cueing on Relativization in Nominative-Accusative Languages

Subject Preference:

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Subject Preference + Morphological Cueing:

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THE NOMINATIVE TRAP

SYNTACTIC FUNCTION?

CASE?
DEPENDENT AND INDEPENDENT CASES

Accusative → Nominative
DEPENDENT INDEPENDENT

Ergative → Absolutive
DEPENDENT INDEPENDENT
ACC \rightarrow (NOM)

ERG \rightarrow (ABS)
**Morphological Cueing**

e.g., Basque, Avar, Niuean
MORPHOLOGICAL CUEING

e.g., Basque, Avar, Niuean
PREDICTION

ACC (NOM)

ERG ?
PREDICTION

ACC (NOM) ✓

ERG (ABS) ✓
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**Grammatical Function and Case in Ergative-Absolutive Languages**

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<th>ERG</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SUB</strong></td>
<td><img src="image1" alt="Pattern" /></td>
<td><img src="image2" alt="Pattern" /></td>
</tr>
<tr>
<td><strong>OBJ</strong></td>
<td><img src="image3" alt="Pattern" /></td>
<td><img src="image4" alt="Pattern" /></td>
</tr>
</tbody>
</table>
THE VALUE OF ERGATIVE LANGUAGES

Ergative languages allow us to dissociate the effect of grammatical function and surface case

Gain for theoretical linguists: testing the psychological reality of grammatical functions

Gain for experimentalists: determining relative contribution of different processing factors
• Initial question: Do ergative languages which allow the extraction of the ergative NP show any difficulty in that extraction?
• Needed to answer that question:
  – An ergative language without syntactic ergativity
  – Sufficient number of speakers to conduct an experimental study
PROCESSING STUDY: AVAR
WHERE IS AVAR?

Transcaucasia Ethnic Groups

Avar Language

1 - Abkhaz  5 - Georgian  9 - Northern Kurd  13 - Lezgi  17 - Avar
2 - Karachay  6 - Ossetian  10 - Nogai  14 - Azerbaijani  Dargwa
3 - Balkar  7 - Russian  11 - Chechen  15 - Armenian  Lak
4 - Mingrelian  8 - Ingush  12 - Krymchak  16 - Turk  & many others

Авар мацӏ
Avar

Nakh-Daghestanian (N.E. Caucasian) > Avar-Andic-Tsezic
   > Avar-Andic

- ~700,000--800,000 speakers
- Modest written tradition
- N.W. & Central Dagestan, Azerbaijan, Turkey
- ~30,000 in Moscow
- Gradually giving way to Russian, with a growing number of recessive bilinguals
Avar = Japanese + ergativity

• SOV
• Head-final
• Morphologically (not syntactically) ergative
• Allows relativization of all arguments, and relativization with gaps of absolutive subject, absolutive object, and ergative subject
AVAR RELATIVE CLAUSES

**Ergative subject gap (transitive subject RC)**

[CAP\(_i\) \(\text{\textit{\texttrade{\textit{\texttrade{ioloqana-y yas repetici-yal-de y-ac\textsuperscript{\texttrade{\texttrade{c}}}-un y-ac\textsuperscript{\texttrade{\texttrade{c}}\textsuperscript{\texttrade{\texttrade{c}}}'}-ara-y}}}}\]]

ERG unmarried-II girl.ABS rehearsal-OBL-LOC II-bring-GER II-come-PRTCP-II

W1 W2 W3 W4 W5 [RC PREDICATE]

artistka\(_i\) bercina-y y-igo

actress.ABS beautiful-II II-AUX

W6 [HEAD NOUN] W7 [SPILL OVER] W8

‘The actress that brought the young girl to the rehearsal is pretty.’
AVAR RELATIVE CLAUSES

**Absolutive object gap (object RC)**

\[
\text{[xalq’iya-y artistka-yał GAP}_i\text{ repetici-yal-de y-ac’y:-un y-ac’y’-ara-y]}
\]

people’s-II actress-ERG **ABS** rehearsal-OBL-LOC II-bring-GER II-come-PRTCP-II

\[
yas_i\text{ bercina-y y-igo}
\]

girl.ABS beautiful-II II-AUX

‘The girl that the distinguished actress brought to the rehearsal is pretty.’
RC DISTRIBUTION: COMPARATIVE %

Avar: Polinsky et al. 2012; Korean: Sejong corpus stats; English: Gordon & Hendrick 2005 (avg. over three corpora)
METHODS

- Used the standard dialect of Avar
- Self-paced reading methodology (SPR) and sentence-picture matching (SPM)
- Conducted in Moscow (SPR) and St-Petersburg (SPM)
- 46/52 participants, 21/27 female; average age 31/35
- Average accuracy rate on comprehension questions in SPR set at 80% (to allow for a population unfamiliar with test-taking)
SELF-PACED READING

The quick brown fox jumps over the lazy dog.
The quick brown fox jumps over the lazy dog.
The quick brown fox jumps over the lazy dog.
The quick brown fox jumps over the lazy dog.
The quick brown fox jumps over the lazy dog.

 _____ brown _____ _____ _____
The quick brown fox jumps over the lazy dog.
The quick brown fox jumps over the lazy dog.
The quick brown fox jumps over the lazy dog.
The quick brown fox jumps over the lazy dog.
The quick brown fox jumps over the lazy dog.
The quick brown fox jumps over the lazy dog.
The quick brown fox jumps over the lazy dog.
Materials

- 18 x \{3\} sentences w/ gapped relative clauses
  - Transitive
    - ERG
    - ABS
    - SUBJ
    - OBJ
  - Intransitive
    - ABS
    - SUBJ
- 40 fillers
- Comprehension questions every ~4 sentences
MATERIALS

• All sentences matched in number of words
• All constituents matched in number of syllables
• Nouns matched in animacy (50/50 animate/inanimate)
• Even distribution of unaccusatives and unergatives in the intransitive condition
• Head noun in absolutive case half the time, ergative case half the time
Absolutive subject gap
Absolutive subject gap

(9)  *Absolutive subject gap (intransitive subject RC)*

\[
\begin{array}{c}
\text{people's-II} \quad \text{actress-obl-loc-near-II} \quad \text{rehearsal-obl-loc} \quad \text{standing-GER} \\
\text{y-ik'-ara-y} \quad \text{yas}_i \quad \text{best'ala-y} \quad \text{y-igo} \\
\text{PRTC-I} \quad \text{girl.ABS} \quad \text{orphaned-II} \quad \text{II-AUX}
\end{array}
\]

‘The girl that stood next to the distinguished actress at the rehearsal is an orphan.’
Absolutive subject gap

(9) **Absolutive subject gap (intransitive subject RC)**

```
[---] xalq’iya-y artistka-yal-da-ask’o-y repetici-yal-de č’:u-n
people’s-II actress-OBL-LOC-near-II rehearsal-OBL-LOC standing-GER
y-ilk’-ara-y] yası best’alay y-igo
PRTCP-II girl.ABS orphaned-II II-AUX
```

‘The girl that stood next to the distinguished actress at the rehearsal is an orphan.’
Absolutive subject gap
Morphological cueing

```
people’s-II  actress-OBL-LOC-near-II  rehearsal-OBL-LOC  standing-GER  PRTCP-II  girl.ABS_i  orphaned-II  II-AUX
W1  W2  W3  W4  W5  W6  W7  W8
```
Morphological cueing

- CP
  - W6
  - $t_i$
    - people’s-II
    - actress
    - -OBL-LOC-near-II
    - rehearsal-OBL-LOC
  - girl.ABS$_i$
  - orphaned-II
  - II-AUX
    - W7
    - W8
Morphological cueing

? Morphological Cueing

- CP
  - girl.ABS
    - girl.ABS
      - II-AUX
      - W7
      - W8
  - CP
    - people’s-II
      - people’s-II
    - actress
      - actress
    - -OBL-LOC-near-II
      - -OBL-LOC-near-II
    - rehearsal-OBL-LOC
      - rehearsal-OBL-LOC
    - standing-GER
      - standing-GER
    - PRTCP-II
      - PRTCP-II
      - W4
      - W5

W1 W2 W3 W4 W5 W6 W7
Grammatical function

CP

- OBL-LOC-near-II

people’s-II actress

W1 W2

rehearsal-OB-L-LOC

W3

standing-GER

PRTCP-II

W4 W5

girl.ABS

orphaned-II

II-AUX

W6 W7 W8
Grammatical function

- people’s-II
- actress
- -OBL-LOC-near-II
- rehearsal-OBL-LOC
- standing-GER
- PRTCP-II
- orphaned-II
- II-AUX
- girl.ABS
- W1
- W2
- W3
- W4
- W5
- W6
- W7
- W8
Absolutive object gap
Absolutive object gap

(8)  *Absolutive object gap (object RC)*

\[xalq'iya-y \quad \text{artistka-yaľ} \quad i\]

\[\text{people's-II} \quad \text{actress-ERG} \quad \text{rehearsal-OBL-LOC} \quad \text{II-bring-GER} \quad \text{II-come-PRTCP-II} \]

\[yasi \quad \text{bercina-y} \quad \text{y-igo} \quad \text{II-AUX} \quad \text{beautiful-II} \]

'The girl that the distinguished actress brought to the rehearsal is pretty.'
Absolutive object gap

(8) Absolutive object gap (object RC)

[xalq’iya-y artistka-yaļ ]
people’s-II actress-ERG
 repleti-ci-yał-de y-ač:-un y-ač’-ara-y]
rehearsal-OBL-LOC II-bring-GER II-come-PRTCP-II

yasī bercina-y y-igo
 girl.ABS beautiful-IP II-AUX

‘The girl that the distinguished actress brought to the rehearsal is pretty.’

Diagram: [Diagram of grammatical structure with labels for DP, CP, N, V_trans, and V_intrans]
Absolutive object gap

people’s-II actress-ERG \( t_i \) rehearsal-OBL-LOC II-bring-GER II-come-PRTCP-II girl.ABS \( i \) beautiful-II II-AUX
Morphological cueing

people’s-II actress-ERG \( t \) rehearsal-OBL-LOC II-bring-GER II-come-PRTCP-II girl.ABS\( \bar{i} \) beautiful-II II-AUX

W1 W2 W3 W4 W5 W6 W7 W8
Morphological cueing

```
CP
 /   
girl.ABSₐ   beautiful-II   II-AUX
       /     
W6     W7     W8

people’s-II actress-ERG tᵢ rehearsal-OBL-LOC II-bring-GER II-come-PRTCP-II
W1   W2   tᵢ   W3   W4   W5

W1  W2  W3  W4  W5

W6  W7  W8

people’s-II actress-ERG tᵢ rehearsal-OBL-LOC II-bring-GER II-come-PRTCP-II girl.ABSₐ beautiful-II II-AUX
W1  W2  W3  W4  W5  W6  W7  W8
```
Morphological cueing

people’s-II actress-ERG rehearsal-OBL-LOC II-bring-GER II-come-PRTCP-II girl.ABS_i beautiful-II II-AUX

W1 W2 W3 W4 W5 W6 W7 W8
Grammatical function

people’s- II actress-ERG \( t_i \) rehearsal-OBL-LOC II-bring-GER II-come-PRTCP-II girl.ABS\(_i\) beautiful-II II-AUX
Grammatical function

Grammatical Function

people’s-II actress-ERG tᵢ rehearsal-OBL-LOC II-bring-GER II-come-PRTCP-II girl.ABSᵢ beautiful-II II-AUX

W1 W2 W3 W4 W5 W6 W7 W8
Ergative subject gap
Ergative subject gap

(7) Ergative subject gap (transitive subject RC)

\[ \underline{\text{UNMAR}} \text{ned-II girl.ABS} \text{rehearsal-OBL-LOC II-bring-GER II-come-PRTCP-II} \]

\[ \underline{\text{ARTISTKA}_i} \text{bercina-y y-igo} \text{beautiful-II II-AUX} \]

\[ \text{W6 [HEAD NOUN]} \text{W7 [SPILL OVER]} \text{W8} \]

‘The actress that brought the young girl to the rehearsal is pretty.’
Ergative subject gap

(7) Ergative subject gap (transitive subject RC)

\[ \text{unmarried-}\text{-II girl.ABS} \]

\[ \text{rehearsal-OBL-LOC II-bring-GER II-come-PRTCP-II} \]

\[ \text{artistka}_i \]

\[ \text{bercina-y y-igo} \]

\[ \text{beautiful-}\text{-II II-AUX} \]

\[ \text{W6 [HEAD NOUN]} \]

\[ \text{W7 [SPILL OVER]} \]

\[ \text{W8} \]

‘The actress that brought the young girl to the rehearsal is pretty.’
Morphological cueing

CP

actress.ABS

beautiful-II

II-AUX

unmarried-II
girl.ABS

rehearsal-OBL-LOC

II-bring-GER

II-come-PRTCP-II

W1

W2

W3

W4

W5

W6

W7

W8
Morphological cueing

```
CP -> actress.ABS_i -> beautiful-II -> II-AUX
  |    |    |   |
  t_i  W6  W7  W8

unmarried-II  girl.ABS  rehearsal-OBL-LOC -> II-bring-GER -> II-come-PRTCP-II
  |    |             |    |    |
  W1  W2  W3  W4  W5
```

W1  W2  W3  W4  W5
Morphological cueing

\[ t_i \]

unmarried-II girl.ABS rehearsal-OBL-LOC II-bring-GER II-come-PRTCP-II actress.ABS \_i \]

beautiful-II II-AUX
Grammatical function

[Diagram of a tree structure with nodes labeled as follows:
- CP
- actress.ABS
- beautiful-II
- II-AUX
- t_i
- unmarried-II
- girl.ABS
- rehearsal-OBL-LOC
- II-bring-GER
- II-come-PRTCP-II
- W1
- W2
- W3
- W4
- W5
- W6
- W7
- W8]
Grammatical function

- CP
  - actress.ABS
  - W6
  - t_i
  - unmarried-II
    - W1
  - girl.ABS
    - W2
  - rehearsal-OBL-LOC
    - W3
  - II-bring-GER
    - W4
  - II-come-PRTCP-II
    - W5
  - II-AUX
    - W7
  - beautiful-II
    - W8
GRAMMATICAL FUNCTION PREDICTIONS
MORPHOLOGICAL CUEING PREDICTIONS
Predictions: Morphological cueing

- ERG left behind
- ABS left behind
- ERG gap
- ABS gap

Legend:
- Absolutive Subject Gap
- Absolutive Object Gap
- Ergative Gap
Predictions: Morphological cueing

projection based on postpositional/adverbia phrase
Predictions: Grammatical function

- Absolutive Subject Gap
- Absolutive Object Gap
- Ergative Gap

Graph showing the predictions for grammatical function with markers for ABS SUB, OBJ, ABS, SUB, ERG SUB, and W1 to W8.
Results

- Absolutive Subject Gap
- Absolutive Object Gap
- Ergative Gap

Time (ms):
- W1
- W2
- W3
- W4
- W5 (RC Predicate)
- W6 (Head Noun)
- W7 (Spill Over)
- W8
Results: W2 (scaled for significance)
Results: W2 (scaled for significance)

Left behind an absolutive → no trigger for argument projection
Results: W2 (scaled for significance)

Triggers storage of postpositional/adverbial phrase in short-term memory.
Results: W2 (scaled for significance)

Left behind an ergative→ projection of absolutive triggered.
Results: W6 & W7 (scaled for significance)
Results: W6 & W7 (scaled for significance)
Results: W6 & W7 (scaled for significance)
Results: W6 & W7 (scaled for significance)

Subject preference disadvantage; morphological cueing advantage (ergative subject left behind).
Results: W6 & W7 (scaled for significance)

Subject preference advantage; morphological cueing disadvantage (absolutive object left behind).
Results: W6 & W7 (scaled for significance)
Results: W6 & W7 (scaled for significance)
Results: W6 & W7 (scaled for significance)

Subject preference advantage; morphological cueing uncertain.
Results: W6 & W7 (scaled for significance)

Subject preference disadvantage; morphological cueing advantage (ergative subject left behind).
DIFFERENT METHODOLOGY: SPM
**Picture-Matching: Error Rate in Head Noun Choice, %**

![Bar Chart]

- **ABS Subject gap**
- **ERG gap**
- **ABS Object gap**

*n.s.*
**PICTURE-MATCHING: RESPONSE TIME ON CORRECT CHOICES**

- **p = 0.08**
- **n.s.**

Picture-matching results, RT (ms) at picture selection, 48 subjects
READING AND PICTURE-MATCHING

Reading sums over W1-7
PICTURE-MATCHING: AVAR VS. KOREAN

Avar SR ~ OR, n.s.

Korean SR < OR, p=0.001
**INTERPRETATION**

<table>
<thead>
<tr>
<th></th>
<th>ABS</th>
<th>ERG</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SUB</strong></td>
<td><img src="image1" alt="Pattern" /></td>
<td><img src="image2" alt="Pattern" /></td>
</tr>
<tr>
<td><strong>OBJ</strong></td>
<td><img src="image3" alt="Pattern" /></td>
<td><img src="image4" alt="Pattern" /></td>
</tr>
</tbody>
</table>

Significant difference → the subject preference is real, but only within ABS
**INTERPRETATION**

<table>
<thead>
<tr>
<th></th>
<th>ABS</th>
<th>ERG</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OBJ</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

No significant difference  ➔ grammatical function & morphological cueing
"cancel each other out"
BACK TO OUR STARTING POINT

• Ergative subjects in Avar are not more difficult to process than absolutive objects
• ... but they are not easier either!
• the processing explanation for syntactic ergativity is hard to maintain
WHAT THIS MEANS OUTSIDE ERGATIVE LGS

• Subject preference in nominative-accusative languages is a cumulative effect of morphological cueing and structural position

• Genuine subject preference in in nominative-accusative languages is to be sought in ambiguous relative clauses where surface cues are absent or suppressed

• Stay tuned...
BEYOND AVAR

- Avar is head-final, and its relative clause looks participial
- What about head-initial languages with a genuine relative clause?
BEYOND AVAR

• Avar is head-final, and its relative clause looks participial

• What about head-initial languages with a genuine relative clause?

• Needed: a head-initial morphologically ergative language without syntactic ergativity
PROCESSING STUDY: NIUEAN
WHERE IS NIUEAN?
# Niuean vs Avar

<table>
<thead>
<tr>
<th>Feature</th>
<th>Niuean</th>
<th>Avar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Word order</td>
<td>VSO</td>
<td>SOV</td>
</tr>
<tr>
<td>Headedness</td>
<td>Strictly head-initial</td>
<td>Non-rigidly head-final</td>
</tr>
<tr>
<td>Morphological ergativity</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Syntactic ergativity</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Relativization with a gap</td>
<td>Subject, object</td>
<td>All constituents</td>
</tr>
<tr>
<td>Agreement</td>
<td>None</td>
<td>Gender/number agreement with ABS</td>
</tr>
<tr>
<td>Reading tradition?</td>
<td>Only the Bible</td>
<td>Kind of...</td>
</tr>
</tbody>
</table>
Ko fe e kulī₁ [ne epoepo he putī ___i?
where ABS dog DEP.TENSE lick ERG cat
‘Where is the dog that the cat is licking?’
Ko fe e kulīi [ne epoepo ___i e puti? where ABS dog DEP.TENSE lick ABS cat

'Where is the dog that is licking the cat?'}
The mean RT for questions gotten wrong was not significantly different than question gotten correct (p=0.8556)
Picture-matching: Response time on correct choices

*Picture-matching results, RT (ms) at picture selection, 47 subjects (Longenbaugh & Polinsky 2015; 2016)*

- ABS Subject gap
- ERG gap
- ABS Object gap

$p = 0.07$

n.s.
Niuean = Avar
WHAT THIS MEANS FOR ERGATIVE LGS

• Languages without syntactic ergativity do not show difficulty in the extraction of the ergative DP as compared to the absolutive object

• Therefore, we cannot make an argument that ergative gaps are inherently difficult

• Syntactic ergativity does not follow from a processing constraint
WHAT THIS MEANS OUTSIDE ERGATIVE LGS

• Subject preference in nominative-accusative languages may be due to a cumulative effect of morphological cueing and structural position.

• Genuine subject preference in in nominative-accusative languages is to be sought in ambiguous relative clauses where surface cues are absent or suppressed.
IS THERE A CLEAN SUBJECT PREFERENCE IN RELATIVIZATION?
AMBIGUITIES

• German feminine and neuter nouns
  
  * German feminine and neuter nouns

  * die Spionin, [die die Komissarin
  the spy.FEM REL NOM/ACC [the superintendent.FEM] NOM/ACC verfolgt hat]
  chased has

  * (i) ‘the spy who has chased the superintendent’

  * (ii) ‘the spy whom the superintendent has chased’

  * (Bader & Meng 1999; Schwarz 2007)
**AMBIGUITIES**

- **Russian inanimates (masc and neuter)**

  \[\text{akvarium, [kotoryj zagoraživaet jaščik]}\]
  \[\text{fishtank which.MASC_{NOM/ACC} blocks box_{NOM/ACC}}\]

  (i) ‘the fishtank that blocks the box’
  (ii) ‘the fishtank that the box blocks’

  (Polinsky 2011; Clemens et al. 2015)
AMBIGUITIES

• In ambiguous extractions, both German and Russian show a strong subject preference (about 80%, depending on a particular study)

• Even in the presence of context cues favoring the object, German speakers show subject preference, contrary to pragmatics (Schwarz 2007)
AMBIGUITIES

In ambiguous extractions, both German and Russian show a strong subject preference.

Russian ambiguous RC: Choice in %

- Native speakers
- Heritage speakers

Subject choice vs. Object choice vs. Noise
MAYAN LANGUAGES
**Mayan Ergativity**

- Mayan languages are exclusively head-marking and thus express ergativity via agreement.
- Some Mayan languages are syntactically ergative (e.g., Q’anjob’al), some are not (e.g., Ch’ol); all have pockets of RC ambiguities.

<table>
<thead>
<tr>
<th></th>
<th>Avar</th>
<th>Niuean</th>
<th>Ch’ol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morphological but not syntactic ergativity</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Headedness</td>
<td>SOV</td>
<td>VSO</td>
<td>VOS</td>
</tr>
<tr>
<td>Ergativity expressed vis</td>
<td>Case</td>
<td>Case</td>
<td>Agreem’t</td>
</tr>
</tbody>
</table>
**CH’OL**

**SUBJECT RELATIVE – CH’OL**

Ta’ jul-i jiñi x’ixikᵢ [ta’-bä y-il-ä-yety ___i ]

PRFV arrive-ITV DET woman PRFV-REL 3.ERG-see-TV-2.ABS

‘The woman who saw you arrived.’

**OBJECT RELATIVE – CH’OL**

Ta’ jul-i jiñi x’ixikᵢ [ta’-bä aw-il-ä ___i ]

PRFV arrive-ITV DET woman PRFV-REL 2.ERG-see-TV

‘The woman who you saw arrived.’
CH’OL

AMBIGUOUS STRING – CH’OL
Ta’ jì́ni x’ìxik ta’bǎ itsák’á jì́ni wiňik.
SR: ‘The woman who cured the man arrived’ or
OR: ‘The woman who the man cured arrived.’

SUBJECT RELATIVE – CH’OL
Ta’ jì́ni x’ìxik [ta’-bǎ i-tsák’-á jì́ni wiňik __i]
PRFV arrive-ITV DET woman PRFV-REL 3.ERG-cure-TV DET man
‘The woman who cured the man arrived.’

OBJECT RELATIVE – CH’OL
Ta’ jì́ni x’ìxik [ta’-bǎ i-tsák’-á __i jì́ni wiňik.]
PRFV arrive-ITV DET woman PRFV-REL 3.ERG-cure-TV DET man
‘The woman who the man cured arrived.’
MAYAN EXPERIMENTS: SPM

(Clemens et al. 2015)
CH’OL RESULTS IN A NUTSHELL

• Unambiguous RCs: Significantly faster response time on **ergative gaps** as compared to **absolutive object gaps**
  – 1377 ms (subject gap)/1513 (object gap), p < .0001

• Ambiguous RCs: Strong preference for subject interpretation
  – 74% subject gap, 15% object gap, 11% noise

(100 subjects; see Clemens et al. 2015 for details and for similar results for Q’anjob’al)
INTERPRETATION

• **Case, but not agreement**, interferes with syntactic function under processing

• Ergative languages that express alignment through case have a different processing profile than ergative languages that express alignment via agreement
CONCLUSIONS
CONCLUSIONS: OUTLINE

• Ergativity
• Subject preference and the Case Trap
• Psychological reality of subjects
CONCLUSIONS: ERGATIVITY

• Back to where we started: The majority of morphologically ergative languages also manifest syntactic ergativity
  – ABS can undergo A-bar movement leaving a gap at the extraction site, but ERG cannot
  – The split can happen even in closely related languages (Mayan, Polynesian)
CONCLUSIONS: ERGATIVITY

• Back to where we started: The majority of morphologically ergative languages also manifest syntactic ergativity
  – ABS can undergo A-bar movement leaving a gap at the extraction site, but ERG cannot
  – The split can happen even in closely related languages (Mayan, Polynesian)

• Syntactic ergativity is puzzling because ERG is subject, so ERG gaps should be favored
CONCLUSIONS: ERGATIVITY

• Processing hypothesis: Syntactic ergativity follows from processing constraints, which may be gradient (soft) in some languages and categorical (strong) in others

• Experimental data from Avar, Niuean, and Mayan indicate that the processing account of syntactic ergativity is untenable
BEYOND TODAY’S TALK

• Assuming that the processing hypothesis does not work, we need a syntactic account of syntactic ergativity

• What is the right explanation behind syntactic ergativity?
CONCLUSIONS: SUBJECT PREFERENCE

• Case cues may interfere with subject preference, either enhancing it (as in nominative-accusative languages), or obscuring it (as in ergative languages)

• Most reliable instances of subject preference are observed in ambiguous strings where case cues are absent
CONCLUSIONS: CASE TRAP
CONCLUSIONS: CASE TRAP
CONCLUSIONS: PSYCHOLOGICAL REALITY OF GRAMMATICAL FUNCTIONS

Ergative languages allow us to dissociate the effect of grammatical function and surface case.

Gain for theoretical linguists: testing the psychological reality of grammatical functions.
CONCLUSIONS: PSYCHOLOGICAL REALITY OF GRAMMATICAL FUNCTIONS

• All the results show a strong difference between transitive subjects (ERG) and intransitive subjects (ABS)
• No evidence for a single category “subject”
• What matters is the competition of two arguments (subject and object)
• Experimental support for the configurational theory of case/GFs (Marantz 2000; Baker 2015; Levin & Preminger 2015)
ACKNOWLEDGMENTS

- **Avar**: Yakov Testelets, Gadzhi Mamedov, Magomed Magomedov, Murad Ziralov
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- **Funding**: Max-Planck Institute, NSF, Davis Center at Harvard, DRCLAS at Harvard, UMD CASL
THANK YOU!

BARKALA!

FAKAUAE LAHI!

WOKÖX AWALÄ!

YUJ WAL DIOS!

DANKE SCHÖN!
EXTRAS
ALTERNATIVE: A SYNTACTIC ACCOUNT
**Main Proposal**

- Syntactic ergativity follows from the status of the ergative as a PP, not DP
  - Some languages have PP-ergatives, others, DP-ergatives
- The PP status of the ergative is associated with a cluster of structural properties which together form a macro-parameter
TWO ERGATIVES

• Parametric variation in ergative case assignment:

```
  TP
  \  \vP
  \  \  
  \  \  
  \  \  
  DP VP
  | ERG
```

OR

```
  TP
  \vP
  \  
  \  
  PP VP
  \  
  \  
  DP P
  | ERG
```
PREPOSITIONAL PHRASES AND A-BAR MOVEMENT

• A PP is a syntactic island for movement
  – DP cannot escape from the island
  – Possible solution: Move the entire PP

• The entire PP cannot move if
  – Movement operator is null (as in relativization), cf. den Dikken (1995)
  – The P head is silent
**Prepositional Phrases and A-bar Movement**

- The entire PP cannot move if
  - Movement operator is null (as in relativization), cf. den Dikken (1995)
  - The P head is silent (also prevents stranding)

- Syntactic ergativity arises when the P head is null and A-bar movement involves a null Op
PRECEDENTS FOR PP-specifiers

• Japanese *ni*-passive (Fukuda 2009, 2013)
• English passives (Goodall 1997)
• Prepositional experiencer subjects (Landau 2010)
## PP vs. DP: General Contrasts

<table>
<thead>
<tr>
<th></th>
<th>PP</th>
<th>DP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can extract (A-bar move) leaving a gap at the extraction site</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Subextraction from XP is possible</td>
<td>No</td>
<td>Yes (unless independently constrained)</td>
</tr>
<tr>
<td>Can serve as pivot of cleft</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Can determine agreement</td>
<td>Only if DP-agreement with all absolutives (subj and obj) is available</td>
<td>Yes</td>
</tr>
<tr>
<td>Can serve as binder of anaphors</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Can host floating quantifiers</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Is accessible to A-movement</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>
COMPARING TWO LANGUAGES

• Tongan
  – Syntactic ergativity
  – Ergative shows PP properties

• Niuean
  – Morphological ergativity only
  – Ergative has all DP properties
Tongan vs Niuean

• Co-occurrence with a preposition
• Neither language has preposition stacking (*from about that corner)
• Tongan ergative cannot co-occur with a preposition: *ki ‘e he ta’ahine ‘with the girl’
• Niuean ergative can co-occur with a preposition: ke he tama ‘with the child’
# Tongan Ergative

<table>
<thead>
<tr>
<th></th>
<th>PP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can combine with a preposition</td>
<td>No</td>
</tr>
<tr>
<td>Can extract (A-bar move) leaving a gap at the extraction site</td>
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</tr>
<tr>
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</tr>
<tr>
<td>Can host floating quantifiers</td>
<td>No</td>
</tr>
</tbody>
</table>
## Niuean Ergative

<table>
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<tr>
<th>Feature</th>
<th>DP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can combine with a preposition</td>
<td>Yes</td>
</tr>
<tr>
<td>Can extract (A-bar move) leaving a gap at the extraction site</td>
<td>Yes</td>
</tr>
<tr>
<td>Can serve as pivot of cleft</td>
<td>Yes</td>
</tr>
<tr>
<td>Is accessible to A-movement</td>
<td>Maybe</td>
</tr>
<tr>
<td>Can host floating quantifiers</td>
<td>Yes</td>
</tr>
</tbody>
</table>
GENERAL HYPOTHESIS

• Languages with syntactic ergativity have a prepositional ergative; the preposition makes it impossible for the ergative to extract
GENERAL HYPOTHESIS

• The presence of a prepositional phrase in the subject position is associated with a set of correlated properties, for example:
  – The ergative cannot serve as a binder of anaphors
  – There is no raising and control in the narrow (syntactic) sense
  – The ergative cannot be pivot of cleft
  – Agreement is with the absolutive, not ergative
  – Other properties: TBD