Isolating-Monocategorial-Associational Language: Phylogeny, Ontogeny, Typology

David Gil
Descriptions of languages can be simpler than they often are.
Isolating-Monocategorial-Associational

IMA

אמא

'mother'
Isolating-Monocategorial-Associational

- **Isolating**
  lacking in word-internal morphological structure

- **Monocategorial**
  lacking in distinct syntactic categories

- **Associational**
  lacking in distinct construction-specific rules of semantic interpretation, relying instead on default application of the association operator
The Association Operator

Monadic Association Operator

A ( X )
'entity associated with X'
in most languages,
observable in genitive construction
The Association Operator

Polyadic Association Operator

\( A ( X, Y ) \)

'entity associated with X and Y'

in most languages,
a default rule for compositional semantics
The Association Operator

tilfanti leavraham

tilfanti leavraham

xxx-telephone xxx-Abraham

A ( TELEPHONE, ABRAHAM )

'entity associated with telephone and Avraham'

* 'Beavers build dams'

'I telephoned Abraham'
Pictograms as IMA Language:
Pictograms as IMA Language:
Isolating

monomorphemic monomorphemic
Pictograms as IMA Language:
Monocategorical
Pictograms as IMA Language:

Associational

'bicycle lane'

'to bicycle shop'
Pictograms as IMA Language: 
Associational

A ( BICYCLE, THATAWAY )
'entity associated with bicycle and thataway'
Where IMA Language is found:

- **Phylogeny**
  Early human language was IMA language
Where IMA Language is found:

- **Phylogeny**
  Early human language was IMA language

- **Ontogeny**
  Early child language is IMA language
Where IMA Language is found:

- **Phylogeny**
  Early human language was IMA language

- **Ontogeny**
  Early child language is IMA language

- **Typology**
  Some languages come closer than others to IMA language
Phylogeny:
Early Human Language as IMA Language

Two hypotheses:

• About cognition:
  At some stage in evolution, the cognitive abilities of humans or pre-humans were limited to the representation of IMA language

• About languages:
  At some stage in evolution, all natural languages were IMA languages
Early Human Language as IMA Language

Kinds of Arguments:

- **Cross-Species Comparison**
  Identifying structural elements in the communication of apes

- **Internal Reconstruction**
  Identifying "tree rings" of structure in contemporary language
Captive Ape Communication as IMA Language

Bonobo (Kanzi) using lexigrams

LIZ HIDE
HIDE AUSTIN
WATER HIDE
HIDE PEANUT

Orangutan (Chantek) using ASL

YOU PULL
COME CHANTEK
BEARD PULL
PULL BEARD

Greenfield and Savage-Rumbaugh (1990)
Miles (1990)
Captive Ape Communication as IMA Language

Isolating

LIZ monomorphemic

HIDE monomorphemic
Captive Ape Communication as IMA Language
Monocategorial

LIZ

S

S

S

HIDE

S
Captive Ape Communication as IMA Language

Associational

Bonobo (Kanzi) using lexigrams

Orangutan (Chantek) using ASL

A A  A A

LIZ HIDE

HIDE AUSTIN

WATER HIDE

HIDE PEANUT

YOU PULL

COME CHANTEK

BEARD PULL

PULL BEARD
Captive Ape Communication as IMA Language

Associational

LIZ  HIDE

A ( LIZ, HIDE )

'entity associated with Liz and hide'
Conclusions:

• IMA language ability can be reconstructed for the common ancestor of humans and great apes, some 10 mya (at least)

• However, actual IMA languages occur only in humans

• There is a huge gap between the evolution of IMA language ability and the evolution of actual IMA languages

• Where, when, and in what population(s) did actual IMA languages first appear?
Actual IMA languages
Some evolutionary scenarios

Homo Erectus  Neanderthals  Humans
Actual IMA languages
Some evolutionary scenarios

IMA Language ability

Homo Erectus  Neanderthals  Humans
Actual IMA languages
Some evolutionary scenarios

Scenario 1:
ancient creation
inheritance only

Homo Erectus  Neanderthals  Humans
Some evolutionary scenarios

Scenario 2:
creation by proto-humans
inheritance only
Actual IMA languages
Some evolutionary scenarios

but actual languages propagate not only vertically, by inheritance but also horizontally, by borrowing

Homo Erectus  Neanderthals  Humans
Actual IMA languages
Some evolutionary scenarios

Scenario 3:
creation by subbranch of humans
intraspecies borrowing
Actual IMA languages
Some evolutionary scenarios

Scenario 4:
creation by Neanderthals
inter- and intraspecies borrowing
Scenario 5: creation by Homo Erectus inter- and intraspecies borrowing
Conclusions:

- while IMA language ability evolved at least 10 mya, actual IMA languages have been around for much less time.
- At present we know very little about where, when and in what population(s) actual IMA languages first arose.
Ontogeny: Early Child English as IMA Language:

Hurt knee

Hurt truck

[playing with toy pig inside toy truck; pig is hurt by sharp corner of truck]

Allison 1;8 (Bloom 1973)
Ontogeny: Early Child English as IMA Language:
Isolating

Hurt knee
Hurt truck

monomorphemic monomorphemic
Ontogeny: Early Child English as IMA Language:
Monocategorial

Hurt knee

Hurt truck

S S

S
Ontogeny: Early Child English as IMA Language: Associational

Hurt knee

Hurt truck
Ontogeny: Early Child English as IMA Language:

Associational

Hurt  knee

↓  ↓

HURT  KNEE

A ( HURT, KNEE )

'entity associated with hurt and knee'
Ontogeny: Early Child English as IMA Language: Associational

Hurt \[\downarrow\] HURT

truck \[\downarrow\] TRUCK

A ( HURT, TRUCK )

'entity associated with hurt and truck'
Typology:
Riau Indonesian as a Relatively IMA Language
Riau Indonesian as a Relatively IMA Language: Isolating

Ayam  makan
CHICKEN  EAT
monomorphemic  monomorphemic
Riau Indonesian as a Relatively IMA Language: Monocategorial

AYAM  
CHICKEN  
makan  
EAT  
S  
S  
S
Riau Indonesian as a Relatively IMA Language: Monocategorial

Identical grammatical behaviour of words denoting things and activities …

★ occurrence as complete non-elliptical sentence

Ayam
'It's a chicken' / 'There's a chicken' …

Makan
'It's an eating' / 'There's an eating' / 'He's eating' …
Riau Indonesian as a Relatively IMA Language: Monocategorial

Identical grammatical behaviour of words denoting things and activities …

★ cooccurrence with *demonstratives*

Ayam ini
'This is a chicken' / 'This chicken' …

Makan ini
'This is an eating' / 'This eating' …
Riau Indonesian as a Relatively IMA Language: Monocategorial

Identical grammatical behaviour of words denoting things and activities …

★ cooccurrence with quantifiers

Tiap ayam
'Every chicken' …

Tiap makan
'Every eating' / 'Every time he eats' …
Riau Indonesian as a Relatively IMA Language: Monocategorial

Identical grammatical behaviour of words denoting things and activities …

★ cooccurrence with *spatial expressions*

Dari *ayam*
'From the chicken' …

Dari *makan*
'From eating' …
Riau Indonesian as a Relatively IMA Language: Monocategorial

Identical grammatical behaviour of words denoting things and activities …

★ cooccurrence with topic marker

Kalau ayam
'As for chicken' …

Kalau makan
'As for eating' / 'If he's eating' …
Riau Indonesian as a Relatively IMA Language: Monocategorial

Identical grammatical behaviour of words denoting things and activities …

★ cooccurrence with existential marker

Ada ayam
'There's a chicken' …

Ada makan
'There's an eating' / 'Somebody's eating' / 'He did eat' …
Riau Indonesian as a Relatively IMA Language: Monocategorial

Identical grammatical behaviour of words denoting things and activities …

★ cooccurrence with "relative" marker

Yang ayam
'The one that's a chicken' …

Yang makan
'The one that's eating' / 'The one that's being eaten' …
Riau Indonesian as a Relatively IMA Language: Monocategorial

Identical grammatical behaviour of words denoting things and activities …

★ coordination

Ayam sama makan
'Chicken and eating'
Riau Indonesian as a Relatively IMA Language: Monocategorial

Ayam
CHICKEN
S

makan
EAT
S

S
Riau Indonesian as a Relatively IMA Language: Associational

Ayam \rightarrow makan
CHICKEN \rightarrow EAT

CHICKEN \rightarrow EAT

A ( CHICKEN, EAT )

'entity associated with chicken and eat'
Riau Indonesian as a Relatively IMA Language: Associational

Ayam makan
CHICKEN EAT

'The chicken is eating'
'Someone is eating the chicken'
'Someone is eating with the chicken'
'Someone is eating because of the chicken'

'The chicken that is eating'
'Where the chicken is eating'
'Why the chicken is eating'

Riau Indonesian as a Relatively IMA Language: Associational

Ayam makan
CHICKEN EAT

'The chicken is eating'
'Someone is eating the chicken'
'Someone is eating with the chicken'
'Someone is eating because of the chicken'

'The chicken that is eating'
'Where the chicken is eating'
'Why the chicken is eating'
Riau Indonesian as a Relatively IMA Language: Associational

Ayam  makan
CHICKEN  EAT

But how do speakers disambiguate?

context

they don't
Riau Indonesian as a Relatively IMA Language: Associational

Predicative/Attributive Indeterminacy:

Speaker, standing on balcony, looks down to street and sees some men pushing a car ...

Mobil rusak
car broken.down

Translator's dilemma: "That car out there is broken down"
Linguist's dilemma: "There's a broken down car out there"

predicative attributive
Riau Indonesian as a Relatively IMA Language:

**Associational**

- **Mobil**
- **CAR**

- **rusak**
- **BROKEN.DOWN**

A (CAR, BROKEN.DOWN)

'entity associated with car and broken down'
But to what extent are other languages like Riau Indonesian?
The Association Experiment

Languages studied:
• Riau Indonesian
• other typologically similar languages: isolating, apparent SVO word order
• more typologically divergent languages: Morphologically complex, other word orders

Semantic domain studied: thematic roles
Goal: measuring the availability of apparently associational interpretations interpretations that are not obtained by the application of construction-specific rules, and which therefore may plausibly be characterized as resulting from the application of the association operator
The Association Experiment

Constructions sought:

Apparently associational interpretations involving thematic roles:

**Peripheral-to-Core (Per ➔ Core)**
Peripheral participants behaving like Core participants
(For isolating SVO languages: *Bare Peripherals*)

**Patient-to-Agent (Pat ➔ Ag)**
Patients behaving like Agents
(For isolating SVO languages: *OV order*)
The clown is drinking the book

4 possible responses

test picture

alternative picture
Badut minum buku

Testing for $\text{Per} \rightarrow \text{Core} (\text{Per} \rightarrow \text{Pat})$
Testing for Per→Core (Per→Pat)  

Anh hè uống sách

?  

test picture  alternative picture
Testing for Per→Core (Per→Pat)  stimulus 15

小丑飲書

?  

test picture  alternative picture
Testing for $\text{Per} \rightarrow \text{Core}$ (Per$\rightarrow$Pat)  

**Kitenga tchì ñxanù**

- **Test picture**
- **Alternative picture**
Testing for Per→Core (Per→Pat)  

testing for Per→Core (Per→Pat)  

?  

הלייזר שות התפתסה  

test picture  

alternative picture  

stimulus 15
Testing for \text{Per$\rightarrow$Core} (\text{Per$\rightarrow$Ag})

\begin{center}
\textbf{The money is happy}
\end{center}

alternative picture \hspace{1cm} test picture

stimulus 8
Testing for Per→Core (Per→Ag)

Duit gembira

alternative picture
test picture

stimulus 8
The soldier is cutting the axe

Testing for Per → Core (Obl → Pat)
Testing for Per→Core (Obl→Pat)  

Tentara potong kampak

alternative picture  

stimulus 14  

test picture
The chairs are jumping

stimulus 6

Testing for Per→Core (Obl→Ag)

alternative picture
test picture
Testing for **Per**→**Core** (Obl→Ag)

stimulus 6

Kursi loncat

alternative picture  

?  

test picture
The dog is drawing

Testing for $\text{Pat} \rightarrow \text{Ag}$

stimulus 3

? text picture alternative picture
Testing for $\text{Pat} \rightarrow \text{Ag}$

stimulus 3

Anjing lukis

? 

text picture

alternative picture
The car is pushing the woman

text picture

alternative picture
Mobil dorong cewek

Testing for $\text{Pat} \rightarrow \text{Ag} \& \text{Ag} \rightarrow \text{Pat}$
Results

Languages

Languages

Per ➔ Core
Pat ➔ Ag
Experimental results

Lots of variation. Why?

Low Associationality

languages with obligatory TAM marking

national languages

High Associationality

languages with optional TAM marking

regional languages
TAM Marking and Per-Core Interpretations

- Obligatory TAM Marking
- Optional TAM Marking

European
Creole
West African
Khoisan
Chinese
MSEA
West Papuan
Malay/Indonesian
AN, West Nusantara
AN, East Nusantara
AN, Philippines & Micronesia
TAM Marking and Pat→Ag Interpretations

- Obligatory TAM Marking
- Optional TAM Marking

- European
- Creole
- West African
- Khoisan
- Chinese
- MSEA
- West Papuan
- Malay/Indonesian
- AN, West Nusantara
- AN, East Nusantara
- AN, Philippines & Micronesia
TAM Marking and Per Core Interpretations

Obligatory TAM Marking

Optional TAM Marking

Local

National
TAM Marking and Per-Core Interpretations

Obligatory TAM Marking

Optional TAM Marking

- Minangkabau

- Malay/Indonesian dialects

- Standard Indonesian

Local

Variant of National

National
TAM Marking and PerCore Interpretations

- Mandarin, Jakarta
- Cantonese
- Mandarin, Beijing

Variant of National
National

Obligatory TAM Marking
Optional TAM Marking
TAM Marking and Pat→Ag Interpretations

- Obligatory TAM Marking
- Optional TAM Marking

Local
Variant of National
National
TAM Marking and Pat→Ag Interpretations

- Obligatory TAM Marking
- Optional TAM Marking

- Minangkabau
- Malay/Indonesian dialects
  - Local
  - Variant of National
- Standard Indonesian
  - National
TAM Marking and Pat→Ag Interpretations

- Obligatory TAM Marking
- Optional TAM Marking

- Mandarin, Jakarta
- Cantonese
- Mandarin, Beijing
- Variant of National
- National
Sociolinguistic Type and Per→Core Interpretations

- European
- Creole
- West African
- Khoisan
- Chinese
- MSEA
- West Papuan
- Malay/Indonesian
- AN, West Nusantara
- AN, East Nusantara
- AN, Philippines & Micronesia
Sociolinguistic Type and Pat→Ag Interpretations

- European
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Experimental results

<table>
<thead>
<tr>
<th>Low Associationality</th>
<th>High Associationality</th>
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<tbody>
<tr>
<td>languages with <strong>obligatory</strong> tense-aspect marking</td>
<td>languages with <strong>optional</strong> tense-aspect marking</td>
</tr>
<tr>
<td>national languages</td>
<td>regional languages</td>
</tr>
</tbody>
</table>

why?
Towards an Explanation

noun/verb distinction

tense/aspect marking

asymmetry predication

thematic role assignment

IMA language
Towards an Explanation

\[ \text{[NCHICKEN]} \quad \text{[vEAT]} \]

\[ \text{TAM} \]

\[ \text{CHICKEN EAT} \]

\[ \theta \]

\[ \text{CHICKEN EAT} \]

\[ \text{CHICKEN EAT} \]
Towards an Explanation

English

Roon

noun/verb distinction

tense/aspect marking

Kapampangan

asymmetry predication

Indonesian

IMA language

thematic role assignment
From Typology back to Phylogeny

Riau Indonesian is a Relatively IMA Language

IMA structure in contemporary languages is an Evolutionary Fossil

Relatively IMA languages are a window into the past: they can tell us what language and civilization was like in prehistoric times

They can answer the question … How much grammar does it take to sail a boat?
How Much Grammar Does It Take to Sail a Boat?

human language

more complex than

other animal communication

human culture and technology

more complex than

other animal culture and technology

correlated how?
How Much Grammar Does It Take to Sail a Boat?

The functional story
How Much Grammar Does It Take to Sail a Boat?

human language

greater complexity

human culture and technology

greater complexity

evolutionary advantage

the archaeological angle

complex language

complex artifact
How Much Grammar Does It Take to Sail a Boat?

- Recent findings suggest that Homo Erectus survived until very recently on the Indonesian island of Flores.
- Flores has been separated from Eurasia for aeons.
- Homo Erectus must have reached Flores by boat.
- Homo Erectus must have had the social and technological skills to build and sail boats.
- Homo Erectus must have had the grammar necessary to support such social and technological skills.

the archaeological angle

complex language  complex artifact
How Much Grammar Does It Take to Sail a Boat?

- Recent findings suggest that Homo Erectus survived until very recently on the Indonesian island of Flores
- Flores has been separated from Eurasia for aeons
- Homo Erectus must have reached Flores by boat
- Homo Erectus must have had the social and technological skills to build and sail boats
- Homo Erectus must have had the grammar necessary to support such social and technological skills
- But exactly how much grammar is that?
Things that are needed:

- reference to future time
- reference to unseen location
- encoding of environmental knowledge
- encoding of technological skills
- maintenance of collective activities

but these are all semantic/pragmatic
Things (grammatical) that are not needed:

- morphology (eg. government, agreement, etc.)
- syntactic categories (eg. nouns, verbs, etc.)
- grammatical relations (eg. subjects, objects, etc.)
- arguments and predication
- movement, empty positions, binding
Fragments of Pure IMA Language from Colloquial Malay/Indonesian Corpora

conversation (Jakarta Indonesian)

Orang mabok tadi suruh David minum apa, dia
person drunk PST:PROX order David drink what
'What did that drunk person just before ask you to drink?'
Fragments of Pure IMA Language from Colloquial Malay/Indonesian Corpora

folk tale (Riau Malay)

Jadi pas balek tu, telinge tak ade kan,
become exact return DEM:DIST ear NEG exist Q

telinga due belah tak ade

ear two CLF NEG exist

'So when she came back, her ears were gone, right,
both of her ears were gone'
Fragments of Pure IMA Language
from Colloquial Malay/Indonesian Corpora

folk poetry (Siak Malay)

Korsi kami korsi kayu / Korsi miko korsi buloh
chair 1 chair wood chair 2 chair bamboo

Orang kami orang Dayak / Orang miko orang Batak
person 1 person wood person 2 person Batak

'Our chairs are wood chairs / Your chairs are bamboo chairs'
'Our people are Dayak people / Your people are Batak people'
Fragments of Pure IMA Language from Colloquial Malay/Indonesian Corpora

Pure IMA language is enough to run a country of 250 million people (with a lot of boats)

Pure IMA language is all that Homo Floresiensis would have needed to sail to Flores
Conclusions

• **Phylogeny**
  Early human language was IMA language

• **Ontogeny**
  Early child language is IMA language

• **Typology**
  Some languages come closer than others to IMA language

Why do most contemporary adult human languages have so much additional non-IMA structure?
Isolating-Monocategorial-Associational Language: Phylogeny, Ontogeny, Typology

David Gil

😊 thank you 😊