Revisiting the prefix/suffix asymmetry: Experimental evidence from Kîîtharaka
(…and English and Mandarin…)

Workshop on prefixes versus suffixes in Afroasiatic

Alexander Martin, 12/03/2022
Talk outline

Introduction

1. Testing the ‘suffixing preference' in English and Kĩtharaka
2. Testing the ‘suffixing preference’ in Mandarin
3. Pitting processing accounts against each other

Discussion
Explaining typological regularities

Typology is shaped by a multitude of factors:

- Linguistic system (e.g., domain-specific representations)
- Cognition (e.g., domain-general biases)
- Cognition-external factors (e.g., history, geography)

Cognitive hypotheses make testable predictions!
Crucially, predictions should be borne out across linguistic populations
The ‘suffixing preference’

<table>
<thead>
<tr>
<th>Classification</th>
<th>Nb. of languages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Little affixation</td>
<td>141</td>
</tr>
<tr>
<td>Strongly suffixing</td>
<td>406</td>
</tr>
<tr>
<td>Weakly suffixing</td>
<td>123</td>
</tr>
<tr>
<td>Equal prefixing and suffixing</td>
<td>147</td>
</tr>
<tr>
<td>Weakly prefixing</td>
<td>94</td>
</tr>
<tr>
<td>Strongly prefixing</td>
<td>58</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>969</strong></td>
</tr>
</tbody>
</table>

Preference for suffixes = 55%

Preference for prefixes = 16%

Importance of word beginnings

(Nootenboom 1981)
Importance of word beginnings

passagier

(Nootenboom 1981)
Importance of word beginnings

passagier

(Nootenboom 1981)
Importance of word beginnings

\textit{passagier}

 passedʒ(ə)ːr

\#pəsəː
Importance of word beginnings

passagier

#p̩ɑsəɹ      aːʒɪɹ#

(Nootboom 1981)
Importance of word beginnings

passagier

Both are totally unique sequences in Dutch…

(Nootoboom 1981)
Importance of word beginnings

*passagier*

Both are totally unique sequences in Dutch…

(Nootboom 1981)
(e.g., Grosjean 1980; Marslen-Wilson 1987)
(e.g., Grosjean 1980; Marslen-Wilson 1987)
(e.g., Grosjean 1980; Marslen-Wilson 1987)
(e.g., Grosjean 1980; Marslen-Wilson 1987)
(e.g., Grosjean 1980; Marslen-Wilson 1987)
(e.g., Grosjean 1980; Marslen-Wilson 1987)
POSTAPOCALYPTIC

POSTMODERN

(e.g., Grosjean 1980; Marslen-Wilson 1987)
POSTAPOCALYPTIC

(e.g., Grosjean 1980; Marslen-Wilson 1987)
postapocalyptic
postmodern
postmortem
postsurgical

happiness
respectfulness
forgetfulness
friendliness

... ... ... ... 

(e.g., Hawkins & Cutler 1988)
Suffixes allow for earlier disambiguation amongst lexical competitors.

(e.g., Hawkins & Cutler 1988)
Suffixes allow for earlier disambiguation amongst lexical competitors.

They also preserve crucial word beginnings.

(e.g., Hawkins & Cutler 1988)
(i.a., Hupp et al. 2009; Murdock 1960; Neath 1993; Wright et al. 1985)
(i.a., Hupp et al. 2009; Murdock 1960; Neath 1993; Wright et al. 1985)
time

pear  pear
tractor tractor
book  book
telephone
building building

(i.a., Hupp et al. 2009; Murdock 1960; Neath 1993; Wright et al. 1985)
time

pear
tractor
book
telephone
building

pear
tractor
book
?
building

pear
tractor
book
?
building

(i.a., Hupp et al. 2009; Murdock 1960; Neath 1993; Wright et al. 1985)
(i.a., Hupp et al. 2009; Murdock 1960; Neath 1993; Wright et al. 1985)
The first element of a sequence is perceptually salient.

(i.a., Hupp et al. 2009; Murdock 1960; Neath 1993; Wright et al. 1985)
The first element of a sequence is perceptually salient.

This domain-general bias influences word recognition.

(i.a., Hupp et al. 2009; Murdock 1960; Neath 1993; Wright et al. 1985)
1. Testing the ‘suffixing preference’ in English and Kĩtharaka
Work done in collaboration with:

Jennifer Culbertson
Which sequence is most similar to the base sequence?

$\text{ta - ba}$

base sequence

$\text{ta - ba - ra}$

‘suffixed’ sequence

$\text{ta - ba}$

identical sequence

(Hupp et al. 2009)
Which sequence is most similar to the base sequence?

**ta - ba**

base sequence

**ta - ba - ra**

‘suffixed’ sequence

**ta - ba**

identical sequence

(Hupp et al. 2009)
Which sequence is most similar to the base sequence?

\[ \text{base sequence: ta - ba} \]

\[ \text{‘prefixed’ sequence: ra - ta - ba} \]

\[ \text{identical sequence: ta - ba} \]

(Hupp et al. 2009)
Which sequence is most similar to the base sequence?

- ta - ba
  base sequence

- ra - ta - ba
  ‘prefixed’ sequence

- ta - ba
  identical sequence

(Hupp et al. 2009)
Which sequence is most similar to the base sequence?

**ta - ba**

base sequence

**ta - ba - ra**

‘suffixed’ sequence

**ra - ta - ba**

‘prefixed’ sequence

(Hupp et al. 2009)
Which sequence is most similar to the base sequence?

**ta - ba**

base sequence

**ta - ba - ra**

‘suffixed’ sequence

?  

**ra - ta - ba**

‘prefixed’ sequence

(Hupp et al. 2009)
Which sequence is most similar to the base sequence?

- ‘suffixed’ sequence
- ‘prefixied’ sequence

(Hupp et al. 2009)
(Hupp et al. 2009)
English speakers

Proportion ‘suffixed’ choice

(Syllables) (Shapes)

(Martin & Culbertson 2020)
<table>
<thead>
<tr>
<th>Classification</th>
<th>Nb. of languages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Little affixation</td>
<td>141</td>
</tr>
<tr>
<td>Strongly suffixing</td>
<td>406</td>
</tr>
<tr>
<td>Weakly suffixing</td>
<td>123</td>
</tr>
<tr>
<td>Equal prefixing and suffixing</td>
<td>147</td>
</tr>
<tr>
<td>Weakly prefixing</td>
<td>94</td>
</tr>
<tr>
<td>Strongly prefixing</td>
<td>58</td>
</tr>
<tr>
<td>Total</td>
<td>969</td>
</tr>
<tr>
<td>Classification</td>
<td>Nb. of languages</td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Little affixation</td>
<td>141</td>
</tr>
<tr>
<td>Strongly suffixing</td>
<td>406</td>
</tr>
<tr>
<td>Weakly suffixing</td>
<td>123</td>
</tr>
<tr>
<td>Equal prefixing and suffixing</td>
<td>147</td>
</tr>
<tr>
<td>Weakly prefixing</td>
<td>94</td>
</tr>
<tr>
<td>Strongly prefixing</td>
<td>58</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>969</strong></td>
</tr>
<tr>
<td>Classification</td>
<td>Nb. of languages</td>
</tr>
<tr>
<td>---------------------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Little affixation</td>
<td>141</td>
</tr>
<tr>
<td>Strongly suffixing</td>
<td>406</td>
</tr>
<tr>
<td>Weakly suffixing</td>
<td>123</td>
</tr>
<tr>
<td>Equal prefixing and suffixing</td>
<td>147</td>
</tr>
<tr>
<td>Weakly prefixing</td>
<td>94</td>
</tr>
<tr>
<td>Strongly prefixing</td>
<td>58</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>969</strong></td>
</tr>
</tbody>
</table>
Kĩtharaka

(1) tũ-bũri  tũ-ra  tũ-ĩri  itũ-thĩ-re
CL₁₃-goat  CL₁₃-DIST  CL₁₃-two  AGR₁₃-leave-PFV

those two small goats left

region where Kĩtharaka is spoken

Mt. Kenya

Nairobi

Mt. Kenya

region where Kĩtharaka is spoken
(Martin & Culbertson 2020)
Preferences in our task seem to track native language affixation patterns!

(Martin & Culbertson 2020)
happiness
respectfulness
forgetfulness
friendliness

...
The *beginning* is informative; pay attention to that!
The ending is informative; pay attention to that!

The beginning is informative; pay attention to that!

happiness, respectfulness, forgetfulness, friendliness, ...
<table>
<thead>
<tr>
<th>Classification</th>
<th>Nb. of languages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Little affixation</td>
<td>141</td>
</tr>
<tr>
<td>Strongly suffixing</td>
<td>406</td>
</tr>
<tr>
<td>Weakly suffixing</td>
<td>123</td>
</tr>
<tr>
<td>Equal prefixing and suffixing</td>
<td>147</td>
</tr>
<tr>
<td>Weakly prefixing</td>
<td>94</td>
</tr>
<tr>
<td>Strongly prefixing</td>
<td>58</td>
</tr>
<tr>
<td>Total</td>
<td>969</td>
</tr>
<tr>
<td>Classification</td>
<td>Nb. of languages</td>
</tr>
<tr>
<td>---------------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Little affixation</td>
<td>141</td>
</tr>
<tr>
<td>Strongly suffixing</td>
<td>406</td>
</tr>
<tr>
<td>Weakly suffixing</td>
<td>123</td>
</tr>
<tr>
<td>Equal prefixing and suffixing</td>
<td>147</td>
</tr>
<tr>
<td>Weakly prefixing</td>
<td>94</td>
</tr>
<tr>
<td>Strongly prefixing</td>
<td>58</td>
</tr>
<tr>
<td>Total</td>
<td>969</td>
</tr>
</tbody>
</table>
2. Testing the ‘suffixing preference’ in Mandarin
Work done by:

Xinyi Wang

Itamar Kastner
Label extension task (Bruening et al. 2012)

This is a *manse*:

Which one of these is a \{ko-manse, manse-ko\}?
Label extension task (Bruening et al. 2012)

This is a manse:

Which one of these is a \{ko-manse, manse-ko\}? 

English-speaking children and adults more readily extended labels with suffixes than those with prefixes.
This is a pefi.
这是pefi.

Here are two items. Which one is a \{pefizo, zopefi\}?
下面 有两个图形, 哪一个是\{pefizo, zopefi\}?

(Wang & Kastner 2020)
This is a *pefi*.

这是*pefi*.

How often do participants extend the label (i.e., choose the same shape)?

(Wang & Kastner 2020)
So English-, Kîîtharaka-, and Mandarin-speaking participants’ responses are in line with the affixation patterns of their native language…

Are prefixes so detrimental to word recognition?
LA SOURIS

LA SOURCE

LA SOUDE

LE CHAT

(e.g., Van Heugten & Shi 2009)
l a s u b i

l a s u b s

l a s u d

l e f a

LA SOURIS

LA SOURCE

LA SOUDE

LE CHAT

(e.g., Van Heugten & Shi 2009)
LA SOURIS

LA SOURCE

LA SOUDE

LE CHAT

(e.g., Van Heugten & Shi 2009)
LA SOURIS

LA SOURCE

LA SOUDE

(e.g., Van Heugten & Shi 2009)
Is this a word?

(Taft et al. 1986)
Is this a word?

dejoice  tejoice  dejouse  tejouse

(Taft et al. 1986)
Is this a word?

dejoice  tejoice  dejouse  tejouse

823  669  794  712

(Taft et al. 1986)
Is this a word?

dejoice  tejoice  dejouse  tejouse

823  669  794  712

(Taft et al. 1986)

‘listeners might actually ignore the acoustic information contained in the prefix while waiting for the acoustic information contained in the [stem]’

(Pycha 2015:56)
Is this a word?

dejoice  tejoice  dejouse  tejouse

823  669  794  712

(Taft et al. 1986)

‘listeners might actually ignore the acoustic information contained in the prefix while waiting for the acoustic information contained in the [stem]’ (Pycha 2015:56)

Listeners cannot use prefixes to predict upcoming information!
‘…do listeners experience spoken prefix material differently than [stems] and suffixes?’ (Pycha 2015:62)
‘...do listeners experience spoken prefix material differently than [stems] and suffixes?’

(midquad) (moatward)

(Pycha 2015:62)
‘...do listeners experience spoken prefix material differently than [stems] and suffixes?’  

(Pycha 2015:62)
‘...do listeners experience spoken prefix material differently than [stems] and suffixes?’

(Pycha 2015:62)

**Prediction**

**LTR:** prefix noise = stem noise

**Discont.:** prefix noise > stem noise
‘...do listeners experience spoken prefix material differently than [stems] and suffixes?’  

(Pycha 2015:62)

**Prediction**

**LTR:**  prefix noise = stem noise

**Discont.:**  prefix noise > stem noise
‘...do listeners experience spoken prefix material differently than [stems] and suffixes?’

(Pycha 2015:62)

**Prediction**

**LTR:** prefix noise = stem noise

**Discont.:** prefix noise > stem noise

No such effect on control words:
<table>
<thead>
<tr>
<th>Classification</th>
<th>Nb. of languages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Little affixation</td>
<td>141</td>
</tr>
<tr>
<td>Strongly suffixing</td>
<td>406</td>
</tr>
<tr>
<td>Weakly suffixing</td>
<td>123</td>
</tr>
<tr>
<td>Equal prefixing and suffixing</td>
<td>147</td>
</tr>
<tr>
<td>Weakly prefixing</td>
<td>94</td>
</tr>
<tr>
<td>Strongly prefixing</td>
<td>58</td>
</tr>
<tr>
<td>Total</td>
<td>969</td>
</tr>
</tbody>
</table>

- **Mandarin**
- **English**
- **Kîîtharaka**
3. Pitting processing accounts against each other
Work (to be) done in collaboration with:

Jennifer Culbertson
John Hotson
Itamar Kastner
wʌgəmɛk
lɛʃəfɪp
a
o
wʌɡəmɛk-a
a-wʌɡəmɛk
Predicted RT

LTR: prefixing = suffixing

Discont.: prefixing > suffixing
ա-վիկչու պատկեր

ա-վիկչու
Predicted RT

LTR: prefixing > suffixing

Discont.: prefixing > suffixing
wəgəmɛk-a
a-wəgəmɛk
Predicted RT

LTR: prefixing << suffixing
Discont.: prefixing ≥ suffixing
Discussion

- **English, Kîîtharaka, and Mandarin** speakers’ preferences align with L1 affixation patterns:
  - Suffixes preferred for English speakers
  - Prefixes preferred for Kîîtharaka speakers
  - No preference for Mandarin speakers

- Prefixes might be helpful too: preceding grammatical information is useful [LTR] (Van Heugten & Shi 2009)
  - …Unless listeners hold prefixes in memory and wait for the stem [discontinuous]
  - Stay tuned for our next study!

- Alternative accounts:
  - Constraints on prosodic phrasing (Himmelmann 2014)
  - Contact (Guzmán Naranjo & Becker 2020)
Returning to typological regularities…

Typology is shaped by cognitive *and* non-cognitive factors…

Cognitive hypotheses make **testable predictions** that can be explored experimentally. Crucially, **cross-linguistic** studies are necessary to make any claims about universality!
Thank you

More details in our paper:


Design and analysis pre-registered at: https://osf.io/3z6kw

And in: