

# **Iterative infixation as prosodically-induced compensatory reduplication**

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# Infixing ludlings

- The insertion of a fully or partially specified sequence of segments into the string of some source forms.

Cuna		<i>ottukkuar sunmakke -ppV-</i>
merki 'American'	⇒	me <b>pper</b> kip <b>ppi</b>
perkwaple 'all'	⇒	pe <b>pper</b> kw <b>app</b> ap <b>le</b> pe
pia 'where'	⇒	pi <b>ppi</b> ap <b>pa</b>
ua 'fish'	⇒	u <b>ppu</b> ap <b>pa</b>

# Diversity of iterative infixing ludling

Tigrinya (Bagemihl, 1988)

Natural Lg	Play Lg 1	Play Lg 2	
s'ähifu	s'ägähigifugu	s'ägähigifugu	'he wrote'
bič'a	bīgič'aga	bīgič'aga	'yellow'
?intay	?igintagay	?iginiğitagayigī	'what'
k'arma	k'agarmaga	k'agarigimaga	'gnat'

# Spanish Jerigonza (Piñeros 1998)

Source	Gloss	Costa Rican	Peruvian
can.ción	'song'	cà.pan.ció.pon	cha.càn.cha.ción
ma.és.tro	'teacher'	mà.pa.è.pes.tró.po	cha.mà.cha.ès.cha.tró
pájaro	'bird'	pà.pa.jà.pa.ró.po	cha.pà.cha.jà.cha.ró

# German Löfflich

- a. -hVlefVC-  
erschlug erherlefeschlughuglefug  
Abel Ahaleyfabelhellefel
- b. VlefVC  
gut gulevut  
besuch belevesulevuch  
antworten alevantwolevortelev.en.

# Diversity of iterative infixes

Greek (Cyprus)

The crow language

-kVkJrdVrVkJkV- (Pound 1964: 20)

alékos 'Alec'

⇒ akakárdarakakálekekérderekekékoskokórdoroskokós

# Properties of iterative infixation

- Affixal iterativity
- Segmental copying and action-at-a-distance
- Output rhythmic alternation

# Infixal ludlings are not intrinsically iterative

**Japanese** **-nosá-** (Pound 1963: 40-41)

wá            wánosá

e             énosá

ŋakó        ŋanosáko

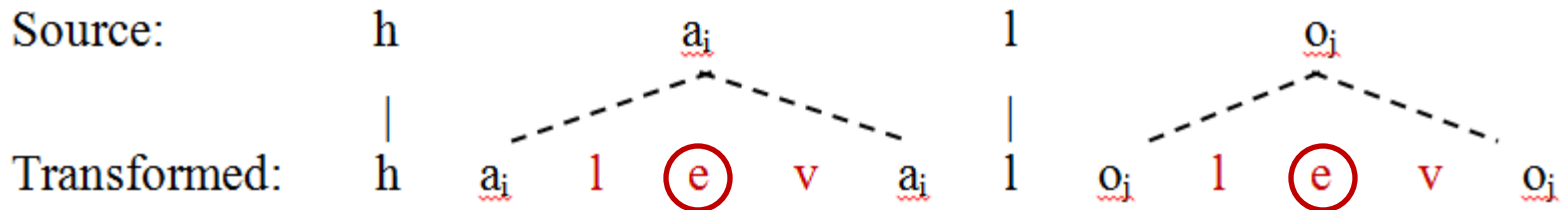
íkimásu    ínosákimásu

watákuši    wánosátakuši



# Segmental copying and action-at-a-distance

**German Löfflich** -VlefVC-  
gut gulevut  
besuch belevesulevuch  
antworten alevantwolevorteleven.



# Output rhythmic alternation

Source	Gloss	Costa Rican	Peruvian
can.ción	'song'	cà.pan.ció.pon	cha.càn.cha.ción
ma.és.tro	'teacher'	mà.pa.è.pes.tró.po	cha.mà.cha.ès.cha.tró
pájaro	'bird'	pà.pa.jà.pa.ró.po	cha.pà.cha.jà.cha.ró

# Hausa iterative ludlings (Alidou 1997)

*hábaʔábà*

a.	gidaa	gibìda	‘house’
	màskaíi	mábàskíi	‘oily’
	màimúnà	máibàimúbùnà	‘Maimuna (name)’
	hátsíi	hábàtsí	‘millet’
	tàabármáa	tábàbàbàrmá	‘mat’
b.	<i>ʔásàdásà</i>		
	nóonòo	nósònósò	‘milk’
	sàndáa	sánsàdásà	‘stick’
	kwáryáa	kwársàyásà	‘calabash’
	bínǵèl	bínsìǵèlsè	‘personal name’

# Hausa iterative ludlings

a. -gVdV-

kàasúwáa ‘market’

⇒ kàgàdàsúgúdúwáa

búuláalàa ‘whip’

⇒ bùgùdùlágádálàa

tàakàlmíi ‘shoe’

⇒ tàgàdàkágádálmíi

màimúnàa ‘person name’

⇒ màgàdàimúgúdúnàa

b. -ʔVsVdV-

ràabiyáa ‘personal name’

⇒ ràaʔàsàdàbíiʔísídíiyàa

kàasúwáa ‘market’

⇒ kàaʔàsàdàsúuʔúsúdúwáa

# Rhythmic Typology

## Disyllabic

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Trochee	Hausa: hátsíi ‘millet’ → (há <b>b</b> à)tsí German: knabe ‘boy’ → (kná <b>b</b> i)(bé <b>b</b> i)
Iamb	Hausa: ʔàbù ‘thing’ → (dàʔ <b>á</b> a)(dà <b>b</b> úu) Tagalog: salá:mat ‘thank you’ → (sagá:)(lagá:)(magá <b>t</b> )

## Trisyllabic

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Dactyl	Hausa: búuláalàa ‘whip’ → (bùgùdù)(lágá <b>d</b> á)làa
Amphibrach	Tagalog: hindíq ‘no, not’ → (higí:din)(digí:din)

## Tetrasyllabic

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Primus paeon	Hausa: màimúnàa ‘personal name’ → (máaʔàsà <b>d</b> àì)(múuʔúsú <b>d</b> ú)nàa
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# Goals

- To outline a general theory of iterative infixation.
  - Iterative infixal ludlings are neither intrinsically iterative nor infixal.
    - The infixal distribution of an affix is due to the fact that the affix subcategorizes for an edge of a phonological unit that does not necessarily coincide with a morphological boundary.
  - Both affixal iterativity and segmental copying are features dependent on the output metrical requirements.
- To offer some evidence for the importance of rhythm in iterative infixing ludlings.

## Hausa *há*bà?á*b*à game

gidaa	gi <b>b</b> ìda	‘house’
màskíi	má <b>b</b> àskí	‘oily’
màimúnà	má <b>i</b> bàimú <b>b</b> ùná	‘Maimuna (name)’
hátsíi	há <b>b</b> àtsí	‘millet’
tàabármáa	tá <b>b</b> àbá <b>b</b> àrmá	‘mat’

# An overview of the analysis

- The infix is *-b-*, which is left-subcategorizing for a head mora of a foot (i.e.,  $\text{Align}(-b-, L, \mu_{\text{HEAD}}, R)$ ).
- The *há b à ? á b à* game imposes the following prosodic well-formedness restrictions on the transformed words.
  - Individual source syllables, except the last, must be parsed into disyllabic trochaic tonal feet
  - The head of a tonal foot in this game must carry a high tone (cf. Leben, 2001), while the weak position of a tonal foot always carries a low tone.



# Infixation as pivot subcategorization

(Yu 2003, 2007; cf. Fitzpatrick, 2006; Nevins & Vaux 2003)

- Infixation is a by-product of Phonological Subcategorization (e.g., Broselow and McCarthy, 1983/1984; Inkelas, 1990; Kiparsky, 1986; McCarthy and Prince, 1986; Paster, 2006; Yu, 2003; Yu, 2007).
- Subcategorization requirements are stated in the formalism of Generalized Alignment (GA, McCarthy and Prince 1993a: 80). Unlike the traditional formulation of GA, the set of PCat includes units on the CV skeletal tier as well as categories within the Prosodic Hierarchy including the mora.

Align (Cat<sub>1</sub>, Edge<sub>1</sub>, Cat<sub>2</sub>, Edge<sub>2</sub>) =<sub>def</sub>

$\forall$  Cat<sub>1</sub>  $\exists$  Cat<sub>2</sub> such that Edge<sub>1</sub> of Cat<sub>1</sub> and Edge<sub>2</sub> of Cat<sub>2</sub> coincide.

Where Cat<sub>1</sub>, Cat<sub>2</sub>  $\in$  **PCat**  $\cup$  GCat

Edge<sub>1</sub>, Edge<sub>2</sub>  $\in$  {Right, Left}

## Source word: *màs.kíi* ‘oily’

Input:	<i>màs.kíi</i> , -b-	*VV	FtBin	Parse
☞ a.	(mábàs)kí			*!
b.	(mábs)kí		*!	*
c.	(mábàs)(kí)		*!	
b.	(mábàs)kíi	*!		

Note: Inputs to word games are assumed to be well-formed words, i.e., syllabified (cf. Piñeros 1998).

### FootBinarity

All feet are binary at the syllabic level.

### Parse- $\sigma$

Every syllable must be footed.

### \*VV

Long vowels are penalized.

## Source word: *màs.kíí* ‘oily’

Input: <i>màs.kíí</i> , -b-	Anchor( $\sigma$ )L	Anchor( $\sigma$ )R	Parse
☞ a. (mábàs)kí			*!
c. (màs <b>b</b> à)kí		*!	*
d. má( <b>b</b> às)kí	**!		*

- **Anchor( $\sigma$ )L**

- The leftmost element of a syllable in the source form corresponds to the leftmost element of a foot in the output.

- **Anchor( $\sigma$ )R**

- The rightmost element of a syllable in the source form corresponds to the rightmost element of a foot in the output.

## Why no affixing *-bV-* word-finally?

Input:	<i>màs.kíi, -b-</i>	FtBin	Anch( $\sigma$ )L	Anch( $\sigma$ )R	Parse
☞ a.	(mábàs)kí				*!
☹ b.	(mábàs)(kíbì)				
c.	(mábàs)(kí)	*!			

# Hausa iterative ludlings

*há*bàʔá*bà*

a.	gidaa	gi <i>b</i> ida	‘house’
	màskíi	má <i>b</i> askíi	‘oily’
	màimúnà	má <i>b</i> àimú <i>b</i> úná	‘Maimuna (name)’
	hátsíi	há <i>b</i> àtsí	‘millet’
	tàabármáa	tá <i>b</i> àbá <i>b</i> ármá	‘mat’

b. ʔásà*dásà*

nóonòo	nó <i>s</i> ónó <i>s</i> ò	‘milk’
sàndáa	sán <i>s</i> à <i>dásà</i>	‘stick’
kwáryáa	kwár <i>s</i> à <i>yásà</i>	‘calabash’
bínḡèl	bín <i>s</i> ì <i>gél</i> sè	‘personal name’

Non-finality is a  
ludling specific  
phenomenon

## Why no affixing *-bV-* word-finally?

Input:	<i>màs.kíi, -b-</i>	FtBin	Nonfinality	Parse
☞ a.	(mábàs)kí			*!
☹ b.	(mábàs)(kíbì)		*!	
c.	(mábàs)(kí)	*!		

### Non-finality

Word-final syllable cannot be footed.

## Why so many *-bV-*?

Input: <i>mài.mú.nà, -b-</i>	FtBin	Anch( $\sigma$ )L	Anch( $\sigma$ )R	Parse
☞ a. (mái. <b>bài.</b> )(mú. <b>bù</b> )ná				*
b. (mái. <b>bài.</b> )(mú.ná)		*!	*	
d. (mái. <b>bài.</b> )(mú)(ná)	*!*			

- The affixal material is duplicated to supply well-formed feet.

## Why not epenthesis?

Input: <i>mài.mú.nà, -b-</i>	FtBin	Anch( $\sigma$ )L	Anch( $\sigma$ )R	Parse
☞ a. (mái <b>b</b> ài.)(mú <b>b</b> ù)ná				*
b. (máibài)(mú?a)ná			*!	
c. (máibài)(mú?u)ná				*



## Why not epenthesis?

Input: <i>mài.mú.nà, -b-</i>	DEP <sub>IO</sub>	INTEGRITY
☞ a. (máibài)(múbù)ná		****
b. (máibài)(mú <u>u</u> )ná	*!	***

- No foreign materials are allowed when segmental fission is an option.

## Why compensatory reduplication of the affix?

Input: <i>mài.mú.nà, -b-</i>	DEP <sub>IO</sub>	INTEGRITY
☞ a. (máibài)(múbù)ná		****
b. (máibài)(múb <u>u</u> )ná	*!	***
☹ c. (máibài)(m <sub>j</sub> úm <sub>j</sub> ù)ná		****

- Why not duplicating the source syllable?

## Source vs. Affix INTEGRITY

Input: <i>mài.mú.nà, -b-</i>	INTEGRITY -C <sub>SOURCE</sub>	INTEGRITY -C <sub>AFX</sub>	INTEGRITY -V <sub>SOURCE</sub>
a. (máib <sub>j</sub> àì)(múb <sub>j</sub> ù)ná		*	**
b. (máib <sub>j</sub> àì)(m <sub>j</sub> úm <sub>j</sub> ù)ná	*!		*

- Source consonant integrity >> Affix consonant integrity
- Source vocalic integrity is unimportant.

# Schematic representation

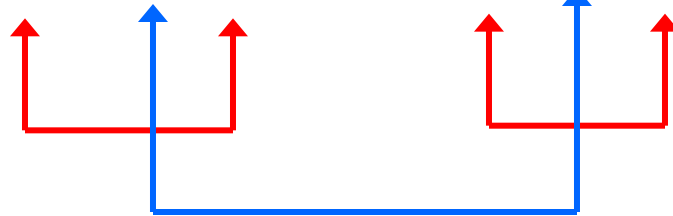
Source:

t aa b a r m aa

| | | | | | | |

Transformed:

(t a b a) (b a b a) r m a



# Summary

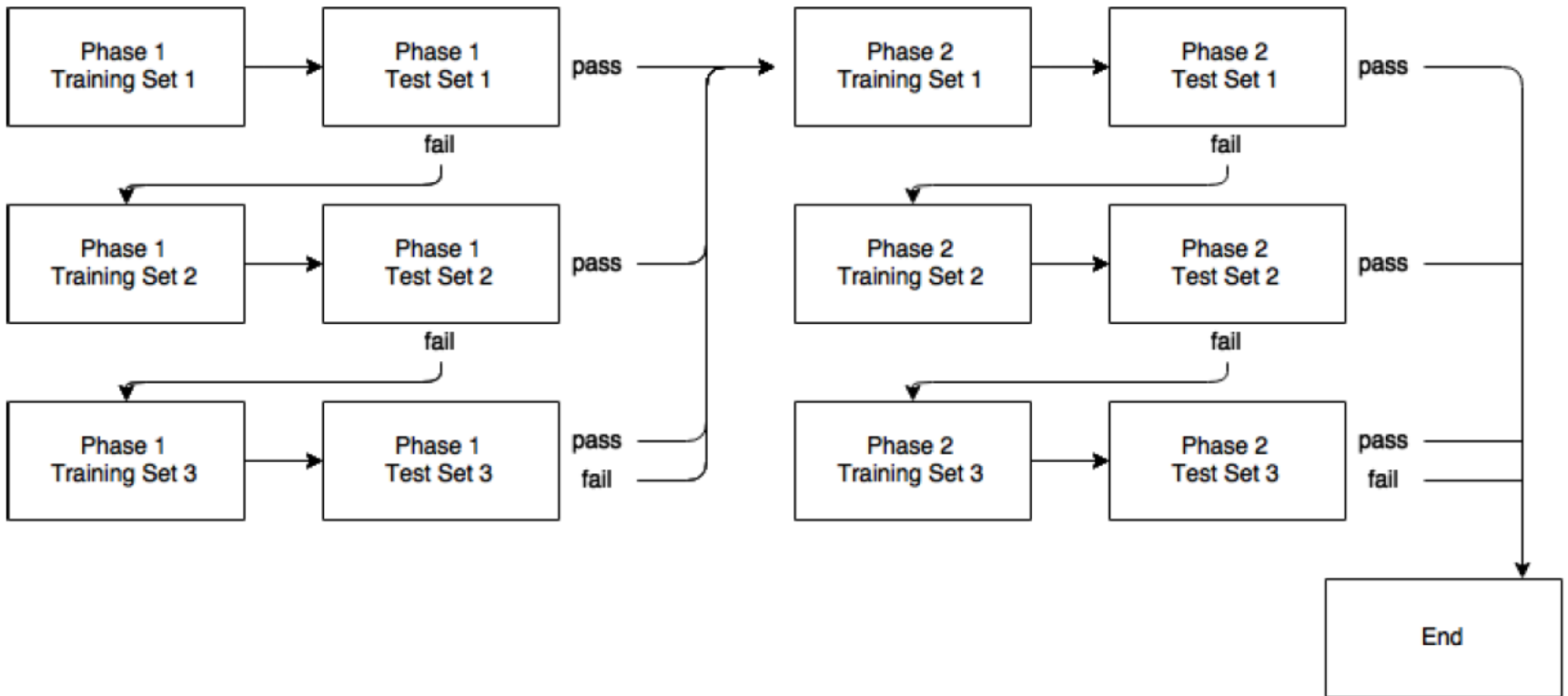
- The treatment of iterative infixing ludling is, at its core, no different from treatments of other phonological affixes.
- The infix in question is subcategorizing for a phonological pivot.
- Output rhythmic requirements lead to:
  - Affixal iterativity is a by-product of prosodic requirements independently imposed by the ludling game.
  - Segmental copying is the result of compensatory reduplication; copying is not a morphological prerogative, but a phonological one.

# Discussion

- Iterativity is impossible as a stand-alone feature of any linguistic phenomenon unmotivated by prosodic or rhythmic factors.
- Rhythmicity may be a strategy to reduce the cognitive burden of processing disguised words in infixing ludling.
  - This proposal is motivated by the observation that iterative ludling infixation appears to correlate with a reduction of phonological complexity.
  - Outputs of iterative infixing ludling often carry less contrastive information than their source word counterparts.
- Contrast reduction is characteristic of iterative infixing ludlings only, not of infixing ludlings in general.
- Contrast reduction might be a strategy to reduce the processing costs of severely disguised words.

# Geiger 2015

- What is the role of rhythmicity in learning iterative infixal luddling?



Geiger, Jeff (2015) *The role of rhythm in iterative-infixing luddlings*. Ms., University of Chicago.

# Geiger 2015: Phase 1

## Two-syllable game

Two-syllable game outputs

Source	Output
me.te	(me.ve).(te.ve)
me.ti	(me.ve).(ti.vi)
mi.ti	(mi.vi).(ti.vi)

## Three-syllable game

Three-syllable game outputs

Source	Output
me.te	(me.lə.ve).(te.lə.ve)
me.ti	(me.lə.ve).(ti.lə.vi)
mi.ti	(mi.lə.vi).(ti.lə.vi)



## Geiger 2015: Phase 2

### “Alternating” game

Alternating game outputs

Source	Output
mete	(me.lə.ve).(te.lə.ve)
meti	(me.lə.ve).(ti.lə.v)
miti	(mi.lə.v).(ti.lə.v)

- Copy if mid
- No copy if high

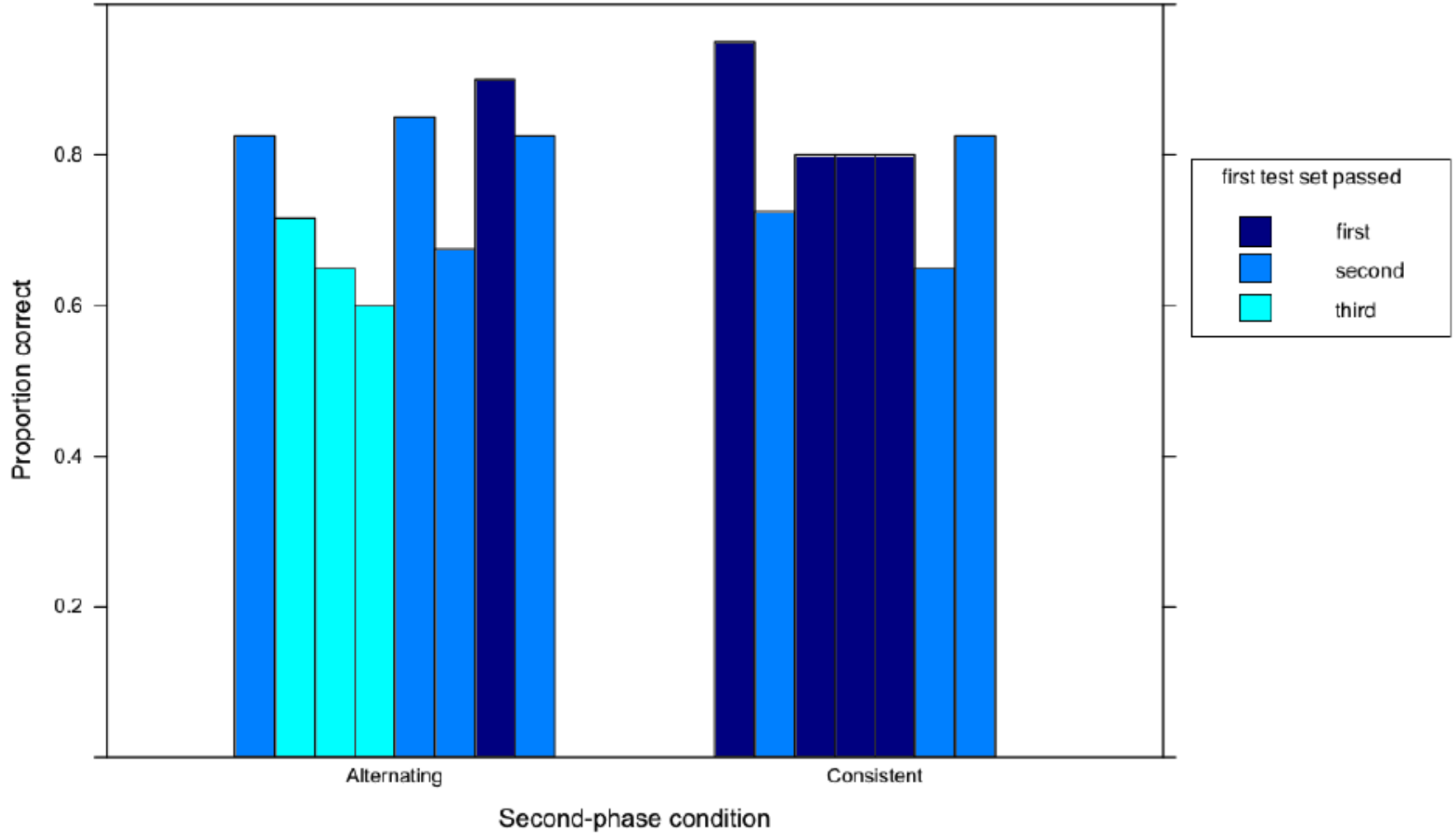
### “Consistent” game

Consistent game outputs

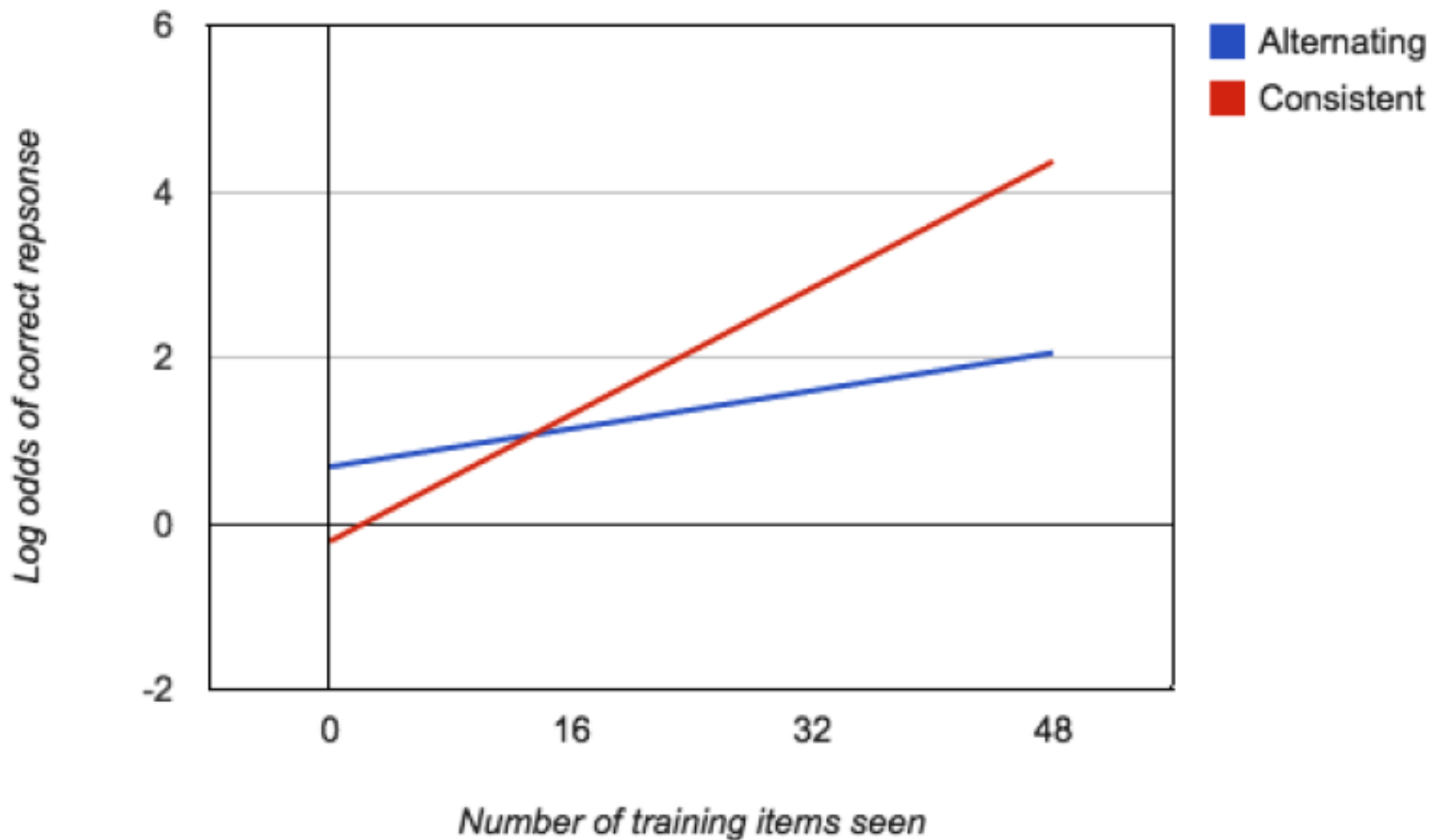
Source	Output
mete	(me.lə.ve).(te.lə.ve)
meti	(me.lə.ve).(ti.lə.və)
miti	(mi.lə.və).(ti.lə.və)

- Copy if mid
- Schwa if high

**Proportion of correct answers by subject and condition**



**Log odds of correct response vs. training**



**Thank you for listening**

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