



The role of rhythm in iterative-infixing ludlings



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Introduction

Yu (2007, 2008) presents a general analysis of iterative-infixing ludlings under which common behaviors like reduplication are phonological repairs to satisfy a **dominant output rhythmic constraint**. I conducted a **ludling learning experiment** to determine whether games with a single type of rhythmic unit in the output are easier to learn than games where constraint interaction forces occasional violation of the rhythmic constraint. Significantly higher gains from training in the rhythmic game suggest that there are grammar-external mechanisms **favoring ludlings with strict rhythmic alternations**, explaining their typological proliferation.

Iterative-infixing ludlings

Iterative-infixing ludlings

Infix appears one time for each source language syllable
One or multiple copies of source nucleus may appear in output foot
Strict output metrical alternation (regular rhythm)
Output foot corresponds to single input syllable

German based game: Löfflich (iamsainlovewithjanik 2008)

Infixation of [-ləv-]; source syllables surface as anapests

[gut] → [gʊ.lə.'vʊt]
['lɔf.liʃ] → [lɔ.lə.'vɔf.li.lə.vɪʃ]
[bɛ.'zʊx] → [bɛ.lə.vɛ.zʊ.lə.'vʊx]

Question

Are games with a uniform output rhythmic alternation easier to learn than games with multiple types of rhythmic units in the output? In the absence of a plausible grammar-internal explanation for the typological skew toward games with regular rhythm, there should be a grammar-external explanation.

Hypotheses

Null hypothesis: There is **no difficulty difference** between ludlings with a regular rhythmic alternation and ludlings without one.

Alternative hypothesis: Ludlings with regular rhythm are **easier to learn** than ludlings without regular rhythm. A regular rhythmic alternation may provide stronger cues about the locations of source language constituents (e.g., the source onset, nucleus, and coda are always in exactly the same position within a rhythmic unit; cf. Yu 2007, 2008 and Vogt 2013). The added difficulty of encoding and retrieving source language forms in ludlings without regular rhythm causes them to fall out of use over time.

Design and procedure

Training sets: Subjects heard 16 pairs of nonce words and their language game outputs in one of two games. They were instructed to deduce the rule or rules transforming the first word into the second word.

Test sets: Subjects heard 20 pairs of nonce words and possible language game outputs. They decided whether the second word was the correct language game output of the first based on the game they had learned in the training set. (50% of outputs were correct and 50% were incorrect.)

The experiment concluded after any test set in which the subject scored at least 80%. If the subject did not attain 80% accuracy in a test set, they participated in another training set and another test set up to a maximum of three pairs of training and test sets.

Participants

18 participants from University of Chicago community. 12 male, 6 female, ages 18-29. 1 male and 1 female excluded for failing to learn a canonical ludling in a task acclimation phase. 1 female excluded for inadequate attention. Subjects volunteered to participate, participated for course credit, or received \$10 for completing five tasks.

Conditions

Two **constructed iterative-infixing ludlings** based on Löfflich. Different strategies for satisfying a constraint family mandating that one source syllable correspond to three output syllables.

Consistent: A game **with regular rhythm**. Single source syllables surface as three-syllable units in the output. Infixation of -ləv-. Reduplication of source nucleus when mid. Epenthesis of [ə] when source nucleus is high. (Split vowel height behavior for comparability with Alternating game.)

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

Alternating: A game **lacking regular rhythm**. Single source syllables surface as two- or three-syllable units in the output. Infixation of -ləv-. Reduplication of source nucleus when mid. When source nucleus is high, no third syllable in output.

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

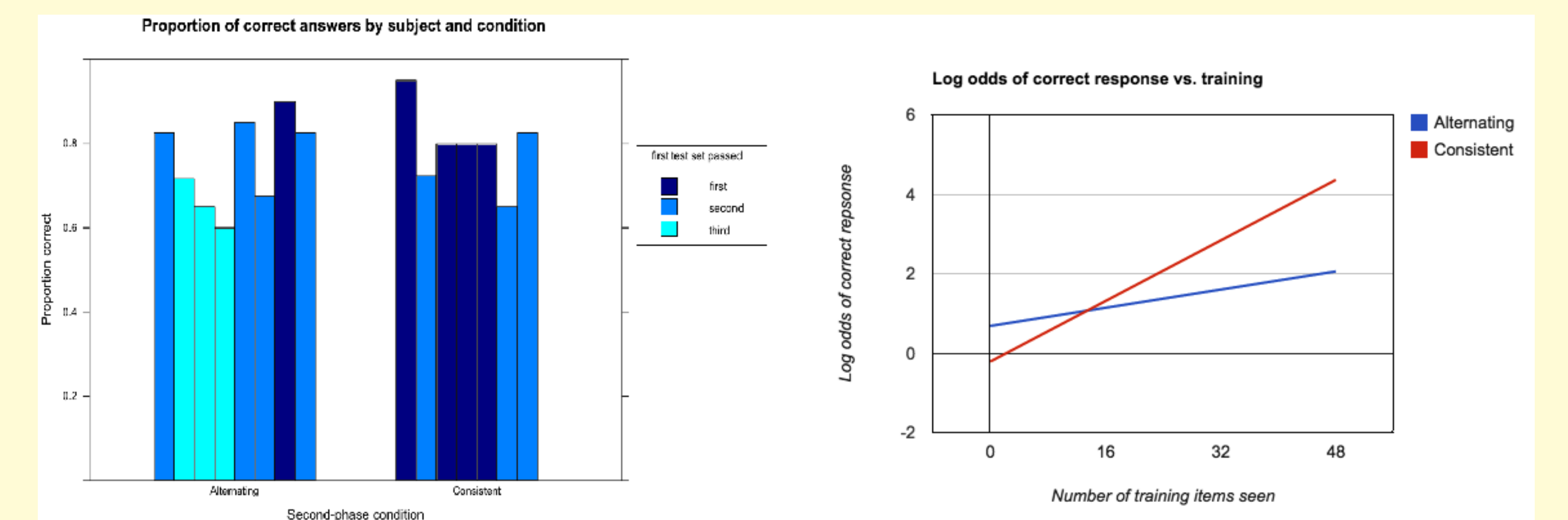
Results and analysis

Logistic mixed-effects regression model. Dependent variable: accuracy on a single test item. Main effects of condition, number of training items seen before responding, and participant sex. Interaction between condition and training. Random intercepts for participant and “source language” word (i.e., item).

Fixed Effects	Estimate	Std. Error	z-value	Pr(> z)
(Intercept)	0.683	0.558	1.223	0.2215
ConditionConsistent	-0.898	0.773	-1.162	0.2452
Training	0.028	0.014	2.015	0.0439*
SexMale	-0.213	0.427	-0.498	0.6182
Condition*Training	0.068	0.034	2.021	0.0433*

Significant **main effect of training:** Subjects' accuracy improved with exposure to additional training items. This effect was expected regardless of hypothesis.

Significant **interaction between condition and training:** The gains from exposure to additional training items were larger in the Consistent condition than in the Alternating condition.



Conclusion

The significant interaction between condition and the effect of training supports a preliminary conclusion that **iterative-infixing ludlings with regular output rhythmic alternations are easier to learn than games with multiple types of output rhythmic units**. This supports a hypothesis under which iterative-infixing ludlings without regular rhythm are typologically rare because they pose learning and implementation challenges not presented by games with regular rhythm.

References

Vogt, B. (2013). Consequences of rhythmic secondary stress in German: stress patterns in language games and past participle formation. *Linguistische Berichte* 2013:171-191. Yu, A. C. L. (2007). *A natural history of infixation*. Oxford University Press. Yu, A. C. L. (2008). On iterative infixation. *Proceedings of the 26th West Coast Conference on Formal Linguistics*, pages 516-524. Löfflich data: **iamsainlovewithjanik**. (June 14, 2008). *loefflich msg*. Retrieved from <https://www.youtube.com/watch?v=Vq7P8dgNQto>