

What is and what should never be Ungrammaticality in G and UG

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Outline

- 1 Introduction
- 2 Modeling universally absent structures
- 3 Ternary rhythm
- 4 Weak local parsing in OT
- 5 Where to?

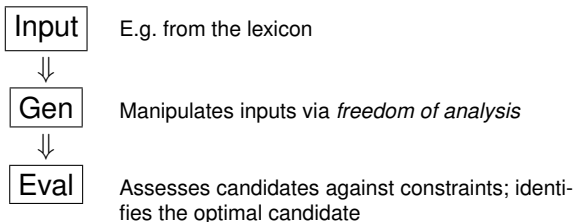
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Questions

- What can we learn about the architecture of a theory by studying *ungrammaticality*?
- Does success in modeling grammaticality *entail* success in modeling ungrammaticality? Is ungrammaticality just the flip-side of grammaticality?
- What are the implications of *absolute* ungrammaticality for the architecture of a model of grammar?

The architecture of optimality theory



A *grammar* in OT is a particular hierarchical arrangement of

Con – the (?universal) set of constraints Con.

Where is ungrammaticality modeled?

- Can the **input** contribute to an understanding of ungrammaticality?
- In OT, the input is not a potential source of explanation for ungrammaticality, given the methodology of *the richness of the base*.

Where is ungrammaticality modeled?

- Can **Eval** contribute?
- A language-specific ranking in Eval distinguishes a set of grammatical utterances from a set of ungrammatical ones, thereby identifying structures which are never optimal in L.
- In this situation, we might say that a model of *grammaticality* entails a model of *ungrammaticality*.

Where is ungrammaticality modeled?

- What is the role of Eval in modeling *language specific absolute ungrammaticality*?
- Eval has to select the null output or a paradigm with a gap.
- In this case, the OT model of grammaticality seems to predict the non-existence of this kind of ungrammaticality. A focus on this kind of ungrammaticality compels further development of the model.

Where is ungrammaticality modeled?

- How does **Con** contribute to modeling ungrammaticality?
- The constraint set Con may be such that a particular structure is never optimal, cf. harmonic bounding.

Harmonic bounding (refresher)

- Candidate X *harmonically bounds* candidate Y iff X violates a proper subset of the constraints violated by Y .
- If Con is universal, there is no grammar (=constraint ranking) in which Y is more harmonic than X .

		CONSTRAINT1	CONSTRAINT2
☞	a. Candidate X	*	
	b. Candidate Y	*	*

- The universal absence of Y *emerges* from Con .

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Where is ungrammaticality modeled?

- How does **Gen** contribute to modeling ungrammaticality?
- Restrictions on the alphabet or functions of Gen could account for universally absent structures.

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The trade-off between Gen and Con

- *Universal absolute ungrammaticality* could follow from the structure of **Gen** or as an emergent result of constraint interaction, i.e. because of the properties of **Con**.
- Why is this trade-off bt. Gen and Con understudied?
 - Independence of OT and theories of structure
 - Freedom of analysis

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 - Independence of OT and theories of structure
 - Freedom of analysis

Freedom of analysis

- By *freedom of analysis* ‘any amount of structure may be posited’ (McCarthy and Prince 1993: 21)
- ‘Gen generates for any given input a large space of candidate analyses by freely exercising the basic structural resources of the representational theory. The idea is that the desired output lies somewhere in this space, and the constraint system of the grammar is strong enough to single it out’ (Prince and Smolensky 1993: 6).

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Anarchy of analysis

- 'The Gen function for syllable structure should admit every conceivable structure, with every conceivable array of affiliations and empty and filled nodes.' (Prince and Smolensky 1993: 26)

Don't mess with Gen

- 'Since Gen is the same in every language, it initially seems like a good place to deposit a wide variety of "hard" universals [. . .] There is a flaw here, though. Hardwiring universals into Gen is inevitably a matter of brute-force stipulation, with no hope of explanation or connection to other matters – it is the end of discussion rather than the beginning.' (McCarthy 2002: 8-9).

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An example of the Gen vs. Con trade-off

- If ternary rhythm exists, does that mean that we need ternary feet? I.e. does ternary rhythm result from a grammar that optimizes candidates with ternary feet? Is the source of ternary rhythm in part the nature of Gen?
- Can ternary rhythm *emerge* through the interaction of constraints which are independently motivated? Can we get ternary rhythm without saying anything special about ternarity at all?

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The rest of the talk

- Look at an analysis claiming that ternarity is emergent.
- Show that it isn't.
- The agenda: The study of *structure* is crucial in phonology; the properties of Gen should be investigated as part of the study of UG.

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A ternary pattern

Based on Cayuvava

- Every third syllable from right if length is $3x$ (200200100)
 - Rightmost stress is primary (1)
 - Other stresses are secondary (2)
 - Other syllables are unstressed (0)
- For words which are not $3x$, no initial stress
 - $3x+2$ (00200100)
 - $3x+1$ (0200100)

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Ternary rhythm with binary feet

- Some pre-OT analyses use ternary feet to get the ternary patterns.
- An alternate approach restricts the inventory of feet, allowing only binary feet, but allows for a parsing strategy which includes *iterative non-parsing*, i.e. a requirement that feet not be adjacent, known as *weak local parsing*.

Weak local parsing

- Ternary patterns with binary feet
 - (20)0(10)0
 - 0(20)0(10)0 No degenerate (unary) feet allowed, therefore no foot on initial [0].
 - 00(20)0(10)0 Can't build a binary foot on initial [00] sequence b/c feet would be adjacent.
- The pre-OT weak local parsing strategy prioritizes a restricted foot inventory through an enhanced repertoire of parsing strategies, namely *strong local parsing* in which feet are adjacent, and *weak local parsing* in which they aren't.

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Weak local parsing in OT


- When ternary rhythm is addressed in OT, the focus is on getting WLP effects as *emergent*.
- To achieve this, something has to favor non-parsing, dominating the constraint PARSE which compels syllables into feet.
- What assumptions about Gen are found in such analyses?

All-Foot-L/R


- Stress patterns can be construed as emanating from an edge of the word. This is modeled with *directionality* in pre-OT metrical theory.
- Since OT isn't derivational, directionality has to be modeled without reference to sequential foot construction.
- The OT strategy is to use a constraint ALLFT-L/R, requiring that the left/right edge of a foot be aligned with the left/right edge of the word, effectively pushing all feet as far as possible towards one edge of the word.

The power of All-Foot-L/R

- Minimize the number of feet


	$\sigma\sigma\sigma\sigma$	ALLFTL	PARSE
a.	$(\acute{\sigma}\sigma)(\acute{\sigma}\sigma)$	*!* *	
 b.	$(\acute{\sigma}\sigma)\sigma\sigma$		**

- Optimize unipedal parses


	$\sigma\sigma\sigma\sigma\sigma\sigma$	ALLFTL	PARSE
a.	$(\acute{\sigma}\sigma)(\acute{\sigma}\sigma)(\acute{\sigma}\sigma)$	*!***** *	
b.	$(\acute{\sigma}\sigma)\sigma(\acute{\sigma}\sigma)\sigma$	*!*** *	**
 c.	$(\acute{\sigma}\sigma)\sigma\sigma\sigma\sigma$		****

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Elenbaas & Kager 1999

We argue that these analyses [of ternary rhythm–CR] require *no ternarity-inducing* [emphasis theirs] mechanisms, such as ternary feet or special parsing modes. Instead, ternarity emerges by LICENSING, involving interactions of the anti-lapse constraint *LAPSE [. . .] with standard foot-alignment constraints [. . .]’ (Elenbaas and Kager 1999: 274)


Restricting ALL-FT-L/R with *LAPSE

- *LAPSE: An unlicensed unstressed syllable is disallowed. (Unstressed syllables are licensed by an adjacent stressed syllable or an adjacent word boundary.)
- Ternary rhythm with *LAPSE*

	$\sigma\sigma\sigma\sigma\sigma$	*LAPSE	ALL-FT-L	PARSE
a.	($\acute{\sigma}\sigma$) <u>$\sigma\sigma\sigma$</u>	*! **		****
b.	($\acute{\sigma}\sigma$)($\acute{\sigma}\sigma$) <u>$\sigma\sigma$</u>	*!	**	**
c.	($\acute{\sigma}\sigma$)($\acute{\sigma}\sigma$)($\acute{\sigma}\sigma$)		****! **	
 d.	($\acute{\sigma}\sigma$) σ ($\acute{\sigma}\sigma$) σ		***	**
e.	σ ($\acute{\sigma}\sigma$) σ ($\acute{\sigma}\sigma$)		****! *	**


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a.	$(\acute{\sigma}\sigma)\underline{\sigma}\sigma\sigma$	*! **		****
b.	$(\acute{\sigma}\sigma)(\acute{\sigma}\sigma)\underline{\sigma}\sigma$	*!	**	**
c.	$(\acute{\sigma}\sigma)(\acute{\sigma}\sigma)(\acute{\sigma}\sigma)$		****! **	
 d.	$(\acute{\sigma}\sigma)\sigma(\acute{\sigma}\sigma)\sigma$		***	**
e.	$\sigma(\acute{\sigma}\sigma)\sigma(\acute{\sigma}\sigma)$		****! *	**

Freedom begets amphibrachs


- This considerable simplification of Elenbaas & Kager's analysis shows their core strategy involving the interaction of *LAPSE and ALL-FOOT-L/R.
- But they don't consider candidates with ternary feet, and if they would, these would win.
- 3x string allowing amphibrachs (Harmonic bounding)*

	$\sigma\sigma\sigma\sigma\sigma$	*LAPSE	ALLFTL	PARSE
a.	$(\acute{\sigma}\sigma)\sigma(\acute{\sigma}\sigma)\sigma$		***!	**
 b.	$(\acute{\sigma}\sigma)(\sigma\acute{\sigma}\sigma)\sigma$		**	*

- Can FTBIN \gg ALLFTL help? It might, but ...

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Rankings for binary and ternary systems

- Weak local parsing (Ternary rhythm)

*LAPSE \gg FOOTBINARITY \gg ALL-FT-L/R \gg PARSE

- Strong local parsing (Binary rhythm)

*LAPSE \gg FOOTBINARITY \gg PARSE \gg ALL-FT-L/R

Degenerate feet in binary systems

- *No degenerate feet*: FOOTBINARITY \gg PARSE

	$\sigma\sigma\sigma$	FOOTBINARITY	PARSE
☞ a.	$(\acute{\sigma}\sigma)\sigma$		*
b.	$(\acute{\sigma}\sigma)(\acute{\sigma})$	*!	

- *Degenerate feet*: PARSE \gg FOOTBINARITY

	$\sigma\sigma\sigma$	PARSE	FOOTBINARITY
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(Incorrect) selection of ternary feet in binary systems

- Unary and ternary feet equally violated FTBIN

	$\sigma\sigma\sigma$	PARSE	FOOTBINARITY
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- ALL-FT-L/R favors the ternary foot (Harmonic bounding)

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	b. $(\acute{\sigma}\sigma)(\acute{\sigma})$		*	*!*
☞	c. $(\acute{\sigma}\sigma\sigma)$		*	

Explicitness in the analysis of binary systems

- How should an analysis eliminate the optimal ternary foot in the binary system?
- In Gen? In Con?
- Gen: ?Produce maximally disyllabic feet.

Eliminate ternary feet in Con

- Con: ?Replace FOOTBINARITY with $*[\sigma\sigma\sigma]_{Foot} \ggg *[\sigma]_{Foot}$
- But, if ternary feet are universally out ex hypothesi, and if this is going to be modeled in Con, then $*[\sigma\sigma\sigma]_{Foot}$ has to be universally high, by stipulation.
- In a factorial typology of freely re-ranked constraints, ternary feet will emerge as optimal when $*[\sigma\sigma\sigma]_{Foot}$ is below $*[\sigma]_{Foot}$

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The role of Gen and Con: Summary

- The analysis of 3ary rhythm selects amphibrachic parses.
- E&K *might* be saved by FOOTBINARITY.
- But—given the binary systems—this proposal is impure.
- Binary systems compel explicit elimination of ternary feet, either in Gen or Con. FOOTBIN can't do the job.

- Do E&K show that we need ‘no ternarity inducing mechanisms’? Maybe.
- Perhaps without realizing it, E&K do have ternarity *prohibiting* mechanisms.
- Either: The binary systems compel a constraint which is stipulated as being universally highly ranked, and which is therefore undominated in the analysis of the ternary systems.
- Or: A restriction on Gen compelled by the binary systems is universal and ∴ present for the analysis of ternary systems.

- Whether they do it in Gen or Con, their analyses of binary and ternary systems stipulate the non-existence or the non-optimality of a candidate with a ternary foot.
- A truly *emergent* analysis of ternary rhythm must consider parses with ternary feet and show that they are harmonically bounded by a WLP parse with binary feet.
- A detailed study of E&K's analysis shows exactly the opposite: For both ternary and binary patterns, analyses with ternary feet harmonically bound the analyses with binary feet.

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Ternary feet?

- There are languages with iterative ternary rhythm.
- If *freedom of analysis* means ‘generate any structure’, then analyses of ternary rhythm should consider candidates with ternary feet.
- If this is done then the parses with ternary feet win (also in the analysis of binary rhythm with stress on the final syllable in an odd parity string).
- One option is therefore to simply accept analyses with ternary feet.

Restricting freedom of analysis

- But maybe ternary feet in fact are not well-formed.
- Maybe a basic principle of constituent structure is that constituents have one head and one non-head.
- If this restriction is imposed on Gen, then we do have to get ternary rhythm with binary feet, and of course the goal is to achieve this with independently motivated constraints.

What's the point?

- Emergent analyses make assumptions about Gen.
- Gen sets the stage for what happens in Con.
- Con has to cope with a set of candidates emitted by Gen.
- Eliminating candidates requires knowing their structures.
- This can be accomplished only by discovering the properties of Gen, i.e. discovering the properties of phonological representations.

One last time: Gen vs. Con

- If some structure is universally absent and if that can follow from constraint interaction, we have an example of an emergent result and the structure of Gen might be irrelevant in this case.
- But when results don't emerge, then the explanation might lie in the structure of Gen.
- We won't know this until we revive the study of structure in phonology, and thereby determine the limits of freedom of analysis.

But, lucky for us, this shouldn't be too hard . . .

- 'In phonology, there is a rough consensus about the properties of Gen.' (McCarthy 2002: 8)

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These slides—and related work—are available at

- castl.uit.no
- [\(hum.uit.no/a/rice\)](http://hum.uit.no/a/rice)

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