

Gorgia and Raddoppiamento Fonosintattico: when strength matters

Irene Amato

Universität Leipzig

17 January 2019 - OCP 16



UNIVERSITÄT
LEIPZIG



INTERACTION OF
GRAMMATICAL
BUILDING BLOCKS

Overview

In Tuscan, singleton consonants have different realizations:

- lenited in intervocalic contexts (1-a): *Gorgia*
- lengthened in some specific contexts (1-b): *Raddoppiamento fonosintattico (RF)*
- default in onset position, after a non vocalic segment (1-c) or in isolation

- (1) a. /la/ /'kasa/ 'the house' → [la'x̣a:za]
 b. /a/ /'kasa/ 'at home' → [a'ḳ:a:za]
 c. /in/ /'kasa/ 'in (the) house' → [inj'ḳa:za]

Gorgia
RF

- Processes in complementary distribution, although in some cases both are expected to apply.
- Great dialectal variation: only Florentine.

In a nutshell

- For the different outcomes of a single underlying form (1): an unified explanation based on *phonological strength*.
- RF: ‘overarticulation’; Gorgia: ‘undershoot’.
- New representation of RF-geminates and of lenited allophones (evidence: different lengths of the derived segments).
- Gradient data as a strong evidence for the framework of *Gradient Symbolic Representations*.
- Better than previous accounts:
 - phenomena in competition + explained through the same mechanism
 - empirical adequacy: gradient linguistic representations
 - further implementation: variation

Data

Raddoppiamento fonosintattico

- *Raddoppiamento fonosintattico* is a sandhi phenomenon of Tuscan and Standard Italian (Vogel 1982, Chierchia 1983–1986., Repetti 1991, Loporcaro 1997, 2001, Passino 2013).
- In the string word₁-word₂, the initial consonant of word₂ (underlyingly singleton) is lengthened, due to some phonological features of word₁.

(2) Lexical RF

a. /tre//kose/ ‘three things’ → [tre**k**:o:ze]

b. /le//kose/ ‘the things’ → [le**χ**ose] (no RF)

- word₁ belongs to a closed set of functional words:

(3) a. *a, da, e, o, ma, né, tra...* ‘to, from, and, or, but, nor, between’

b. *come, dove, qualche...* ‘how, where, some’

(4) **Stress-driven RF**a. /par'lo//bene/ 's/he talked well' → [par'lo'**b**:e:ne]b. /'parla//molto/ 's/he talks well' → ['parla'**β**e:ne] (no RF)

- word₁ is stressed on the final syllable → phonologically predictable gemination.
- Lengthening effect of stress:
 - across the word boundary: RF
 - word-internally: vowel lengthening in non-final open stressed syllable:

(5) /'ka.sa/ → ['ka:.za]

- In Italian, length is distinctive for consonants, but not at the word-edge.

Gorgia Toscana

- **Gorgia** ('Tuscan throat') consists of the lenition of intervocalic consonants in Tuscan Italian (Giannelli & Savoia 1978, Giannelli 1997, Marotta 2006, 2008, Ramsammy 2017).
- (6)
- a. /'bruko/ 'caterpillar' → ['bru:xo, 'bru:ho]
 - b. /a'krobata/ 'acrobat' → [a'xrɔ:βaθa]
 - c. /la/ /'ko:sa/ 'the thing' → [la'hɔ:sa]
 - d. /la/ /'kre:ma/ 'the cream' → [la'xrɛ:ma] (Marotta 2008)
- targets primarily stops,
 - but fricatives and sonorants become approximants, liquids and nasals may be deleted, affricates lose their occlusive subsegment (Marotta 2008),
 - independently from the position of the stress,
 - word-internally and across word boundaries.
 - Lenited segments: contextual variants.

The interaction of Gorgia and RF

The two phenomena are in complementary distribution:

	Gorgia	RF
(a) post non-stressed vowel (word-internally)	✓	✗
(b) post stressed vowel (word-internally)	✓	✗
(c) post non-stressed vowel (across word-boundary)	✓	✗
(d) post stressed vowel (across word-boundary)	✗	✓
(e) post lexical RF-word (across word-boundary)	✗	✓
(f) post glide	✓	✗

Competition?

Problem

Contexts where the conditions for RF and lenition are simultaneously met

- after a stressed vowel across a word-boundary:

(7) *città cara* ‘dear town’
 /tʃiˈt:a/ /'kara/ → [tʃiˈt:a'k:a:ra]

☞ word-internally, Gorgia is independent from stress; across word-boundary, it is only possible after non-stressed vowels. Why?

Acoustic data

Length of RF-segments

RF-geminates are shorter than lexical geminates.

- Experiment on four Florentine speakers (Campos-Astorkiza 2014):
 - Stress-driven RF-consonants: 47% longer than the corresponding singleton consonants.
 - Lexical geminates: 238% longer than the corresponding singletons.
- Experiment on five Pisan speakers (Payne 2005): in the context 'V_V, RF-segments are always significantly shorter than lexical geminates.

	word-internal duration	word-boundary duration
/b:/	146.34 ms	102.84 ms
/p:/	186.55 ms	149.36 ms
/d:/	154.44 ms	81.3 ms
/t:/	179.02 ms	126.38 ms

RF-geminates resemble singletons, rather than moraic geminates.

- In Italian, the distinction of phonological length is realized also through a difference in articulatory fortition (‘palatal effect’) (Payne 2005).
- This increase in occlusion is absent in RF-segments

☞ RF-segments may have a different structure than lexical geminates
→ ‘stronger singletons’

Length of Gorgia-segments

- (8)
- a. /il fatto/ ‘the fact’ → [il'fat:o]
 - b. /i fatti/ ‘the facts’ → [i'fat:i]
 - c. /il patti/ ‘the pact’ → [il'pat:o]
 - d. /i patti/ ‘the pacts’ → [i'ϕat:i]

Phonematic fricatives (8-b) are longer than the allophonic fricatives (8-d).

In Florentine, the labiodental [f] is longer than its allophones [θ] and [ϕ] (Soriano 2002: 34):

- (9) [f]= 83 ms » [θ]= 66 ms » [ϕ]= 51 ms

Non-lenited stops (8-c) are longer than their lenited allophones (8-d).

In Florentine (Soriano et al. 2003):

voiceless stops	voiceless fricatives	voiced fricatives	approximants
[k], [p], [t]	[θ], [h], [ɸ]	[β], [ɦ], [ð]	[ɣ], [d]
88 ms, 70 ms, 67 ms	66 ms, 63 ms, 51 ms	51 ms, 44 ms, 40 ms	39 ms, 28 ms

target of lenition  + lenition

☞ Allophones may have a different structure from the default realization of phonemes (phonematic fricatives, phonematic stops).

Analysis

The framework

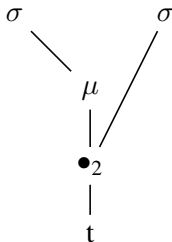
- **Gradient Symbolic Representations** (GSR) (Smolensky & Goldrick 2016, Faust & Smolensky 2017, Zimmermann 2017, Trommer & Zimmermann 2018, Zimmermann 2018*b*).
- Numerical weight expresses the degree of strength (as activity or presence) of a symbol in a linguistic representation.
- Gradience may be associated to input and output elements and may be interpreted by the phonetics (Zimmermann 2018*a*, McCollum 2018).
- The phonological property of strength is independent from other autosegmental objects (moras, features...).
- The harmonic evaluation is couched in *Harmonic Grammar*, where the constraints are weighted, not ranked.

The proposal

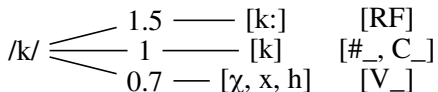
- **Phonetic length** is a correlate of **phonological strength**.
- **RF-gemination**: association to a segment of some extra-strength, which is originally associated
 - either to another segment (Lexical RF)
 - or to the stressed syllable (Stress-driven RF).
- **Lenition**: subtraction of strength from a segment, triggered by a Markedness constraint.

How it works

- The gradient activity of **output** segments can be other than 1.
- **Stress** (the strong position in a foot (Gordon 2011, Kramer 2009) brings into the representation some phonologically derived extra-activity that can be transferred from the suprasegmental tier to a segment.
- **RF-geminates**: non-moraic consonants associated to a strength value greater than 1. Lexical geminates: moraic consonants (Hayes 1989, Goldsmith 1996). Derived long vowels: stronger than 1.
- **Lenited allophones**: segments that are weaker than default.

(10) **Moraic geminate**(11) **RF-geminate**(12) **Singleton**(13) **Lenited allophone**

(14) phoneme strength allophone context



- **RF-geminates**: segments stronger than 1 ('more present' in the linguistic representation) → interpreted by the phonetics as long.
- **Gorgia-allophones** $[\chi, x, h, \gamma, \beta, \phi, \theta, \delta]$: defective segments weaker than 1 ('not completely present') → interpreted by the phonetics as short.
- Phonematic fricatives ($/f, v, s, z/$) have default strength 1.

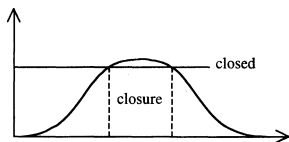


Figure 1. Representation of a **singleton** stop (Kirchner 2000: 525).

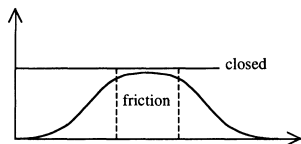


Figure 2. Representation of a **lenited** stop (Kirchner 2000: 525).

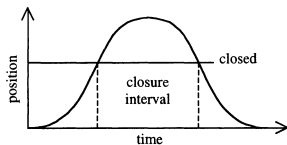


Figure 3. Representation of a **RF-geminate** stop (in (Kirchner 2000: 525), geminate stop).

Derivations

Gorgia Toscana

(15) *la casa* ‘the house’/la/ /'kasa/ → /la 'k_{0.7}asa/ → [la 'xa:za]

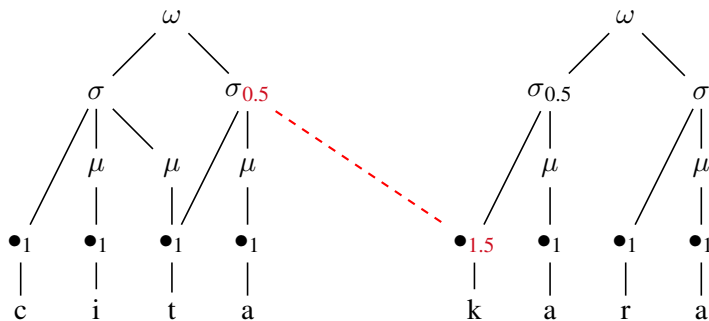
/la'k ₁ asa/	MAX[STR] ¹	FULL!	WEAK!-C-V_V	H
<i>weight</i>	+20	-3	-30	
a. lak ₁ asa	1		1	-10
☞ b. lak _{0.7} asa	0.7	0.3	0.7	-7.9

- Trigger for lenition WEAK!-C-V_V: markedness constraint against intervocalic consonant.
- The output segment /k_{0.7}/ is realized by the phonetics as a lenited variant of /k/ ([χ, x, h], depending on the variety and the speed of the speech).

¹In the tableaux, violations and rewards are registered only for the relevant segment(s).

Stress-driven RF

- (16) *città cara* ‘dear town’
 /tʃiˈt:a/ /ˈkara/ → /tʃiˈt:a k_{1.5}ara/ → [tʃiˈt:ak:a:ra]



‘dear town’

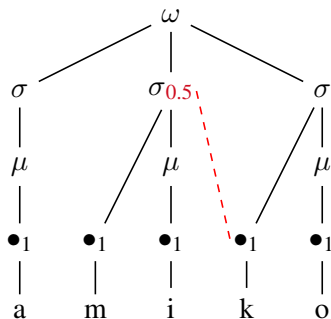
/fʃi'ta ^{0.5} k ₁ ara/	MAX[STR]	DEP[STR]	REALIZE[STR]	FULL!	ONE!	ONE!-V#	WEAK!-C-V_V	H
<i>weight</i>	+20	-8	-30	-3	-2	-50	-30	
a. fʃi't:a k ₁ ara	2		0.5				1	-5
☞ b. fʃi't:a k _{1.5} ara	2.5	0.5			0.5		1.5	0
c. fʃi't:a _{1.5} k ₁ ara	2.5	0.5			0.5	0.5	1	-10
d. fʃi't:a _{1.5} k _{0.7} ara	2.2	0.5		0.3	0.5	0.5	0.7	-7.9
e. fʃi't:a k _{0.7} ara	1.7		0.5	0.3			0.7	-2.9

- ONE!-V# does not allow extra-strength to be realized on the final vowel, therefore strength shifts to the adjacent segment.²
- The trigger for RF is MAX[STR] in ganging effect with REALIZE[STR].
- Even though the context for Gorgia is met, the segmental realization of strength overcomes the need for weak consonants, bleeding Gorgia.

²The strength is not realized on the previous consonant word-internally because of a contiguity constraint (Landman 2002): DEP[STR]-C-MORPH.

A step back to lenition

If the stress brings some extra-strength that can be realized on a segment, why cannot this stress-activity protect the consonant that is target of lenition?



‘friend’

Stress-vowel lengthening

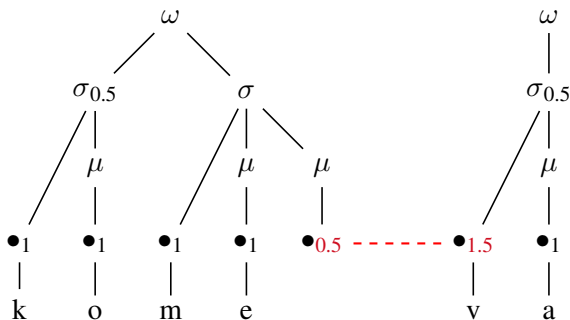
(17) *amico* 'friend'
 /a'mi^{0.5} ko/ → /a'mi_{1.5} k_{0.7}o/ → [a'mi:**xo**]

/a'mi ^{0.5} ko/	MAX[STR]	DEP[STR]	REALIZE[STR]	FULL!	ONE!	WEAK!-C-V_V	H
<i>weight</i>	+20	-8	-30	-3	-2	-30	
a. a'miko	2		0.5			1	-5
b. a'mi _{1.5} ko	2.5	0.5			0.5	1	+15
☞ c. a'mi _{1.5} k _{0.7} o	2.2	0.5		0.3	0.5	0.7	+17.1
d. a'mik _{0.7} o	1.7		0.5	0.3		0.7	-2.9
e. a'mik _{1.5} o	2.5	0.5			0.5	1.5	0

- The stressed vowel is a suitable host for the stress-strength.
- The extra-strength is not shifted to the following consonant.
- The consonant can be independently lenited.

Lexical RF

If word₁ is a member of the closed lexical class in (3), it contains in the final position a defective root node, too weak to surface.³



‘how are you?’

³This correspond to the final etymological consonant (Loporcaro 1997). The synchronic alternation itself allow to assume the presence of an element in that position.

- (18) *come va* ‘how are you?’
 /'kome●_{0.5}/ /'va/ → /'kome 'v_{1.5}a/ → ['ko:me 'v:a]

/kome● _{0.5} 'va/	MAX[STR]	DEP[STR]	REAL[STR]	FULL!	ONE!	ONE!-V#	WEAK!	UNIF	MAX[SEG]	H
<i>weight</i>	+20	-8	-30	-3	-2	-50	-30	-1	-60	
a. kome● _{0.5} 'va	2		0.5						0.5	-5
☞ b. 'kome 'v _{1.5} a	2.5	0.5			0.5		1.5	1.5		-1.5
c. 'kome _{1.5} 'va	2.5	0.5			0.5	0.5	1	1.5		-11.5
d. 'kome _{1.5} 'v _{0.7} a	2.2	0.5		0.3	0.5	0.5	0.7	1.5		-9.4

- The coalescence between the final segment of word₁ and the initial one of word₂ allows the strength in the input to survive in the output.
- The conditions for lenition are not met because the consonant is not adjacent to the vowel.
- Extra-strength is not only phonologically derived, but segments with underlyingly different level of activity are predicted by this account.

Conclusion

Conclusion

- Claim: phonetic length is a correlate of phonological strength.
- New account of Tuscan *Raddoppiamento fonosintattico* and *Gorgia*.
- New representation of the derived segments based on strength.
- RF arises by associating extra strength to a segment.
- Gorgia implies a decrease of strength.

This approach:

- considers the competition between these two phenomena and their complementary distribution (after oxytonic word: RF over Gorgia).
- has a broader empirical adequacy than the previous ones,
- has the potential for further implementations:
 - the synchronic variability in input and output
 - the diachronic development in weakening and strengthening processes
 - inherently long consonants
 - backward gemination
- offers a new contribution to the debate on the division between phonetics and phonology.

Thank you!

Irene Amato
University of Leipzig
irene.amato@uni-leipzig.de
www.amatoirene.com

References I

- Absalom, Matthew, Mary Stevens & John Hajek (2002): .A typology of spreading, insertion and deletion or what you weren't told about Raddoppiamento Sintattico in Italian. In: *Proceedings of the 2002 Conference of the Australian Linguistic Society*. .
- Bertinetto, Pier Marco & Michele Loporcaro (2005): 'The sound pattern of Standard Italian, as compared with the varieties spoken in Florence, Milan and Rome', *Journal of the International Phonetic Association* **35**(2), 131–151.
- Campos-Astorkiza, Rebeka (2014): 'Lengthening and prosody in Tuscan Italian', *Anuario del Seminario de Filología Vasca "Julio de Urquijo"* (46.1), 83–108.
- Celata, Chiara & Barbara Kaeppli (2003): 'Affricazione e rafforzamento in italiano: alcuni dati sperimentali', *Quaderni del Laboratorio di Linguistica della SNS* **4**.
- Chierchia, Gennaro (1983–1986.): 'Length, syllabification and the phonological cycle in Italian', *Journal of Italian Linguistics* (8), 5–33.
- Faust, Noam & Paul Smolensky (2017): Activity as an alternative to autosegmental association. In: *talk given at mfm 25, 27th May, 2017*. .
- Giannelli, Luciano (1997): 'Tuscany', *The dialects of Italy* pp. 297–302.
- Giannelli, Luciano & Leonardo M Savoia (1978): 'L'indebolimento consonantico in Toscana', *RID. Rivista Italiana di Dialettologia Bologna* **2**(1), 23–58.

References II

- Goldsmith, John A., ed. (1996): *The handbook of phonological theory*. Vol. 75, Blackwell Publishing.
- Gordon, Matthew (2011): *Stress System*. Vol. The handbook of phonological theory, Blackwell Publishing, chapter 5, pp. 141–163.
- Hayes, Bruce (1989): ‘Compensatory lengthening in moraic phonology’, *Linguistic inquiry* **20**(2), 253–306.
- Kirchner, Robert (2000): ‘Geminate inalterability and lenition’, *Language* pp. 509–545.
- Kramer, Martin (2009): *The phonology of Italian*. .
- Landman, Meredith (2002): *Morphological contiguity*. Vol. Papers in Optimality Theory II: UMOP 26. GLSA: Umass-Amherst, Carpenter et al.
- Loporcaro, Michele. (1997): *Lengthening and raddoppiamento fonosintattico*. Vol. The Dialects of Italy, chapter 5, pp. 41–51.
- Loporcaro, Michele (2001): *Rules vs. constraints in modeling phonological change: the case of Raddoppiamento Fonosintattico*. Vol. Trends in linguistics studies and monographs, pp. 269–290.
- Marotta, Giovanna (2006): ‘An OT account of Tuscan spirantization’, *Lingue e linguaggio* (2), 157–184.

References III

- Marotta, Giovanna (2008): ‘Lenition in Tuscan Italian (gorgia toscana)’, *Lenition and fortition* pp. 235–270.
- McCollum, Adam (2018): Gradient morphophonology: Evidence from Uyghur vowel harmony. In: *talk given at AMP 6* .
- Passino, Diana (2013): ‘A unified account of consonant gemination in external sandhi in Italian: Raddoppiamento Sintattico and related phenomena’, *The Linguistic Review* 30.2 pp. 313–346.
- Payne, Elinor M. (2005): ‘Phonetic variation in Italian consonant gemination’, *Journal of the International Phonetic Association* 35(2), 153–181.
- Ramsammy, Michael (2017): The phonology–phonetics interface in constraint-based grammar. In: *The Routledge Handbook of Phonological Theory*. Routledge, pp. 68–99.
- Repetti, Lori (1991): ‘A moraic analysis of raddoppiamento fonosintattico’, *Rivista di Linguistica*. (3), 307–330.
- Smolensky, Paul & Matthew Goldrick (2016): ‘Gradient symbolic representations in grammar: The case of French Liaison’, *ROA 1286* .
- Sorianello, Patrizia (2002): ‘I suoni fricativi dell’italiano fiorentino’, *Quaderni del Laboratorio di Linguistica* 3, 26–39.

References IV

- Sorianello, Patrizia, MJ Solé, D Recasens & J Romero (2003): Spectral characteristics of voiceless fricative consonants in Florentine Italian. In: *Proceedings of the 15th International Congress of Phonetic Sciences*. pp. 3081–3084.
- Trommer, Jochen & Eva Zimmermann (2018): The strength and weakness of tone: A new account to tonal exceptions and tone representations. In: *talk given at Phorum, UC Berkeley, 19th March, 2018*. .
- Vogel, Irene (1982): *La sillaba come unità fonologica*. Bologna: Zanichelli.
- Zimmermann, Eva (2017): Gradient symbolic representations in the output: A typology of lexical exceptions. In: *talk given at NELS 48*. .
- Zimmermann, Eva (2018a): Exceptional non-triggers are weak: The case of Molinos Mixtec. In: *talk given at OCP 15*. .
- Zimmermann, Eva (2018b): Gradient Symbolic Representations and the Typology of Ghost Segments. In: *talk given at AMP 6*. .

The constraints

- 👉 **MAX[STR]**: Assign z reward for every activity (x) that is present in the input and is associated to a segment in the output (y) ($z = y$) (Smolensky & Goldrick 2016: 18).
 - MAX[STR] rewards underlying activity that makes it to the surface.
- 👉 **DEP[STR]**: Assign z violation for every output segment that is associated with y strength and a corresponding input segment that is associated with x strength ($z = y - x$).
- 👉 **REALIZE[STR]**: assign z violation for every activity (y) that is present in the input but has no realization on an output segment ($z = y$).
 - MAX[STR] and REALIZE[STR] have a cumulativity effect for the realization of the input strength on the output segment.
- 👉 **UNIFORMITY**: Assign z violation for each output segment (y) that corresponds to more than 1 input segment ($z = y$) (Smolensky & Goldrick 2016: 17).
 - This constraint penalizes coalescence of segments.

- 👉 **FULL!**: Assign z violation for every segment that has strength $y < 1$ in the output ($z = 1 - y$).
- 👉 **ONE!**: Assign z violation for every segment that has strength $y > 1$ in the output ($z = y - 1$).
- 👉 **ONE!-V#**: Assign z violation for every final vowel that has strength $y > 1$ in the output ($z = y - 1$).
 - This is a markedness constraint that penalizes final vowels stronger than 1.
- 👉 **WEAK!-C-V_V**: Assign z violation for every intervocalic consonant with strength y in the output ($z = y$).
 - This constraint is a version of the scalar effort minimization constraint **LAZY**, which prefers segments that are “cheaper” to produce (Kirchner 2000).
- 👉 **STRENGTH-TO-STRESS**: Assign z violation for every segment stronger than 1 (y) that is not identical or adjacent to the nucleus of the stressed syllable ($z = y - 1$).
 - This is a constraint on the output and can be split into two versions:
 - 👉 **STRENGTH-TO-STRESS[V]**: Assign z violation for every vowel stronger than 1 (y) that is not stressed ($z = y - 1$).

- ☞ STRENGTH-TO-STRESS[C]: Assign z violation for every consonant stronger than 1 (y) that is not adjacent to the nucleus of the stressed syllable ($z = y - 1$).
- ☞ MAX[SEGM]: Assign z violation for every segment that is present in the output with a strength (y) equal or lower than 0.6 ($z = 1 - y$).
 - This constraint penalizes deletion of segments.

Previous accounts

RF: previous accounts

- Vogel (1982), Chierchia (1983–1986.): RF due to independent conditions on syllable structure, such as the *Strong Rhyme Condition*.
- Repetti (1991): a moraic analysis, a right-to-left mora-filling process.
- Passino (2013): RF results as the interpretation of an empty CV slot internal to a phonological string.
- Crucially, all previous analyses consider RF segments as geminates → empirically inadequacy.
- They also fail to account for case of non-application of RF (for instance, after diphthongs) (Absalom & Hajek 2002).

Gorgia: previous accounts

- Kirchner (2000): process of promotion on an abstract scale of strength, due to a scalar effort minimization constraint LAZY.
- Marotta (2006): markedness constraint against non continuous segments after vowels.
- Ramsammy (2017): an analysis of Tuscan lenition at the phonology-phonetics interface.
- They cannot explain why Gorgia is overcome by RF after an oxytonic word.

- There is no previous analysis that can account for both RF and Gorgia by using the same mechanism.
- Gradient length distinctions do not follow naturally from these accounts.
- Phonetic findings are implementation of phonological distinctions.

Appendix

I. Competition after a diphthong

- An oxytonic word₁ contains a diphthong in its final stressed syllable (also with optional glide deletion (19-b))(Loporcaro 2001, Absalom & Hajek 2002):⁴

- (19)
- farai bene* ‘you will do well’
/fa'raj/ /'bene/ → [fa 'raj **β**e:ne]
 - fara' bene* ‘you will do well’
/fa'ra/ /'bene/ → [fa 'ra **β**e:ne]
 - farà bene* ‘s/he will do well’
/fa'ra/ /'bene/ → [fa 'ra **b**:e:ne]

☞ At least in (19-b), RF is expected to apply, but it does not. Why?

⁴I have not found any phonetic transcription of the outcome in (19-a)-(19-b) in the literature. I have consulted a speaker of Florentine, who produced (19-a). Moreover, my competence as Tuscan speaker suggests the application of Gorgia.

- (20) a. *vorrei parlare* ‘I would like to talk’
 /vo'r:ɛj/ /**p**ar'lare/ → /vo'r:ɛj**p**0.7ar'lare/ → [vo'r:ɛj Φ ar'la:re]
- b. /vo'r:ɛ/ /**p**ar'lare/ → /vo'r:ɛ**p**0.7ar'lare/ → [vo'r:ɛ Φ ar'la:re]
 (glide deletion)

/vo'r:ɛ ^{0.5} j par'lare/	MAX[STR]	DEP[STR]	REALIZE[STR]	FULL!	ONE!	ONE!-V#	WEAK!-C-V_V	*Σ>2	STR-TO-STR[C]	H
<i>weight</i>	+20	-8	-30	-3	-2	-50	-30	-50	-6	
a. vo'r:ɛj par'lare	2		0.5				1			-5
b. vo'r:ɛ _{1.5} j par'lare	2.5	0.5			0.5		1	0.5		-10
c. vo'r:ɛj _{1.5} par'lare	2.5	0.5			0.5	0.5	1	0.5		-35
d. vo'r:ɛj p _{1.5} ar'lare	2.5	0.5			0.5		1.5		0.5	-3
[⊗] e. vo'r:ɛj p _{0.7} ar'lare	1.7		0.5	0.3			0.7			-2.9
f. vo'r:ɛ _{1.5} j p _{0.7} ar'lare	2.2	0.5		0.3	0.5		0.7	0.5		-7.9

- The behaves as a vowel.
- Neither the stressed vowel nor the glide can get the extra-strength, because the syllable would become too strong.
- RF could happen, since it is due to the extra-strength and not to a final stressed vowel.
- However, the consonant is not adjacent to the nucleus of the stressed syllable (the glide intervenes, even if deleted) → RF is disfavored.
- Gorgia applies, since its context is met.

II. No RF on vowels

- (21) *città amica* ‘friendly town’
 /tʃi't:a/ /a'mika/ → /tʃi't:a a₁'mika/ → [tʃi't:aa'mi:ka]

/tʃi't:a ^{0.5} amika/	MAX[STR]	DEP[STR]	REALIZE[STR]	ONE!	ONE!-V#	STR-TO-STR[V]	H
<i>weight</i>	+20	-8	-30	-2	-50	-50	
☞ a. tʃi't:a amika	2		0.5				+25
b. tʃi't:a a _{1.5} mika	2.5	0.5		0.5		0.5	+20
c. tʃi't:a _{1.5} amika	2.5	0.5		0.5	0.5		+20

→ RF impossible if the first segment of word₂ is a vowel.⁵

⁵In Italian, a vowel can be long only if (i) stressed, (ii) non-final, (iii) in open syllable. The constraints ONE!-V# + STRENGTH-TO-STRESS[V] + *Σ>2 penalize these marked configurations.

III. No Stress-driven RF in Southern varieties

- Outside Tuscany, only Lexical RF → Why does stress not trigger RF?
- Does stress trigger stressed vowel lengthening?
 - No → Stress does not bring extra-activity into the representation
 - Yes → Different STRENGTH-TO-STRESS: Assign z violation for every segment stronger than 1 (y) that is not identical to the nucleus of the stressed syllable ($z = y - 1$).⁶

⁶The violation of STRENGTH-TO-STRESS is tolerated for Lexical RF.

IV. inherent geminates

- Gradient length distinctions and different structures can be found for other segments as well.
- In Italian, inherent geminates are consonants inherently long: /ɲ, ʎ, ts, dz, ʃ/
 - intermediate behavior between a singleton and a geminate (Bertinetto & Loporcaro 2005)
 - intermediate length (Celata & Kaeppli 2003): [n]= 49 ms « [ɲ]= 94 ms « [n:]= 109 ms
- Gradient Symbolic Representations predicts the existence of inherently strong segments.
- These segments neither undergo RF nor lenition (as geminates)
 - too strong.