



## Structure preservation

- syllable structure recorded in the lexicon
- no resyllabification
- no syllabification algorithm

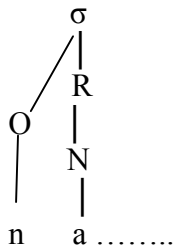
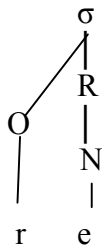
!! *Syllabification in orthodox theory:*

*I* unparsed string *Bol. e:ren* “they were” >

syllabification algorithm (assign a vowel to the nucleus and a prevocalic consonant to the onset position, maximise onset, SSP, coda rule...)>

syllable structure *e:-ren*

vs. *e:ren arivé* “they were arrived” *e:-re-na-ri-vé*



*Syllabification in GP:* recorded in the lexicon, function of

- the internal structure of segments
- universal principles (lateral relations contracted by segments)

## 2. The internal structure of segments: Element Theory

- In GP subsegmental structure is represented by means of phonological primes called **elements** (cf. also Dependency and Particle Phonology)
- Elements are
  - *Individual autonomous, phonetically interpretable linguistic units.*
  - *Cognitive objects*
  - *Elements are either present or absent. There is no notion of [-element] (**Privativity**)*
  - *Elements can be shared between segments*
  - *Segments may be composed of one or more elements (primitive vs compound segments)*
- Idealized spectrographic patterns where qualitative rather than quantitative values are relevant.

- Elemental patterns are templates which hearers want to detect in perception and speakers want to match in the production. When a given element is input to speech production mechanisms the speaker will marshal whatever articulatory resources are necessary or available for the spectral realisation of the target elemental pattern
- Features have generally an articulatory basis. Jakobson et al. are a noteworthy exception and as they points out what is really shared between speakers and listeners is the acoustic experience.
- The version of ET employed here is that of Backley (2011), which uses only six elements to represent the segmental properties of languages A I U (vocalic elements) H L ? (consonantal elements) (among others KLV 1985, Scheer 1996, Kaye 2000, Rennison and Neubarth 2003).

## 2.1 The representation of vowels

The simplest vowel inventory		Elemental makeup	
i	u	I	U
a		A	

This is the vowel-inventory of Sicilian dialects in unstressed position.

The vowels /a, i, u/

- universally unmarked
- their phonological behaviour tells us that they are basic vowels, they cannot be further broken down. They do not contain other elements.

A richer vowel system			Elemental makeup	
i		u	I	U
ε	ɔ		A I	AU
a			A	

- This is the vowel-inventory of Sicilian in tonic-position.
- In Sicilian complex vowels reduce to simplex vowels in weak (pretonic) position. Destressing cause reduction to simplex vowels by element delinking.

dɔrmi “sleep 3sg” vs. dur'miva “3sg. impf.” ɔva “eggs” vs. uvicɛdɔi “eggs dim” AU > U  
 perdi “lose 3sg” vs. pirdiva “lose 3sg. impf.”, denti “tooth” vs. dintuzzu “tooth dim” AI > I

- The unstressed position is weak and in some systems only simple vowels are licensed in weak position. In complex vowels elements are combined to obtain compound vowels.
- To increase the generative power of elements head-dependent relations, familiar from syntactic relations, are used: in headed expressions one element is prominent.  
 e AI vs. ae AI (in Backley 2011 also non headed expression)

- The element structure of segments becomes apparent by studying phonological data, contrasts, distributional patterns, dynamic processes where the individual elements in a compound become visible. Like with the Sicilian data on vowel reduction we look at phonological processes involving vowels.
- This will give us the element composition of vowels and provide evidence for the basic status of A, I, U.
- A I U in headed structures = /a i, u/ in non-headed structures = ə ɪ ʊ

Monophthongisation CAUSAM > *Florentine* kɔ:sa AU > ɔ

Diphthongisation AMOREM > *Bolognese* amaur “love”, FORNUM < fauren “oven” o > AU

TELAM > *Bolognese* tajla “cloth”

SERAM > *Altamuran* sair “evening”, SOLAM saul “aloneF.”

Coalescence CAENA > *Florentine* tʃe:na “dinner” A AI > AI

Vowel reduction *Abruzzese* jɔ:kə “play:1,3SG” jukɔ:mə “play1PL” o AU > ʊ U (non headed)

kɔndə “count:1,3SG kundɔmə

jɛttə jɛttɔmə e AI > ə A (non headed)

pɛsə pɛsɔmə

*Salentino* sento “hear1sg” sintimu “hear1pl”

kanosku “know 1sg” kanuʃʃimu “know1pl”

A?

Vowel harmony Height harmony = A demotion

Cervara (Lazio) sirinu, vini cf. St.It. sereno, venire “serene, to come”

ATR harmony (head alignment). No ATR in Harris & Lindsay 1995/Bacckley 2011

ATR harmony in *Mussomeli Sicilian*

bi'dɔni bi'duna “bin S/P”

li'mɔni li'muna “lemon S/P”

mu'liɔ mu'lina “mill S/P”

pu'rɪtu pu'rɪta “rotten.M/F.”

A is transparent or A triggers head “agreement”  
ɪ ʊ are “underlying”

fu'mamʊ “smoke 1pl”

mun'nati “peel 2pl”

Metaphony (raising of high mid vowels) A harmony, if A is not present in the harmonic trigger A is demoted from the target.

ROSSU > russu AU –A > U

ROSSA > rossa

ROSSI > russi AU – A > U

ROSSÆ > rosse

*Salentino (Acquarica)* mete meti metu “reap 3sg/2sg/3pl”

*Campidanian Sardinian* ATR or A demotion?

lentu lenta “slow:M/F”

veru vera “true:M/F”

mot:u motta “dead m.”

nou noa “new:M/F”

- Evidence for AIU being basic vowel elements

Some other vowel combinations /y/ = I, U

Parametrised tier conflation prevents I and U fusing in languages with no front rounded vowels

## 2.2 The representation of consonants

- As a result of employing shared elements, ET blurs the division between consonants and vowels, at least at the segmental level.
- The consonant-vowel split is still expressed by syllable structure: vowels occupy the syllable nucleus while consonants belong in non-nuclear (onset or coda) positions.
- Each element has two different interpretations – a vowel interpretation (when it is syllabified in a nucleus) and a consonant interpretation (when it appears outside the nucleus).

### 2.2.1 Glide formation

- Glide formation is a process that reinterprets V.V sequences as V.CV sequences by extending the first vowel into the following onset position.
- It provides us with phonological evidence that glides and vowels are distinguished mainly by their distribution and that they contain the same features or elements

*Teraman* onsetless vowels get [ɥ] epenthesis.

[ɥ] epenthesis takes place also between the prefix *r-* and a vowel-initial stem.

aryɛʃʃə “he goes out”

if the stem is /i/ or /u/ initial homorganic glide epenthesis is possible/preferred

aryiʃʃə /arjiʃʃə ‘you go out’

aryuprà /arwuprà “to do surgery again”

*Altamuran* U propagation

/u ‘penə/ [u ‘p<sup>w</sup>ɛin]

/kussu ‘melə/ [k<sup>w</sup>ussu mweil]

/nu gga’raddʒə/ [nu gwaraddʒ]

## 2.2.2 Place of articulation in consonants

- I A U in consonant represent the place of articulation. Unified subsegmental primes for consonant and vowels are able to express generalisations which appear arbitrary in other systems (like SPE) where consonantal and vocalic features are different.

### 2.2.2.1 The I element

- [ɹ̥] defines the natural class of palatals and is present in palatal and palatalised segments [ç ʝ ʒ ʒ̥ kʲ ɲ j ʎ]. Evidence that palatals contain headed [ɹ̥] comes from assimilation processes in which palatal consonants interact with front vowels.
- ç ʝ palatovelars are complex segments and need to be represented by two elements I, U

#### *Altamuran*

u fronting to y after coronals and palatals in closed stressed syllables

/cʊmmə/ [cʏm]: “lead”

/tʊnnə/ [tʏn:] “round”

/nʊttsə/ [nʏtts] “stone (of a cherry, olive etc.)”

- In many languages palatals and coronals behave as a single class so this provides us with evidence that also coronals contain I. Coronals are non-headed by I whereas palatals are (acoustic evidence concerning F2 values)
- Palatals are inherently strong as a result of being headed; and so they are often active in assimilation processes and remain palatal under most conditions. By contrast, coronals are weak because they are non-headed (coronal unmarkedness)
- Coronal unmarkedness in the dialects of Italy (coronal sonorants)

#### *r assimilation in Romanesco and middle Italian dialects*

far me > ‘famme “do-IND.OBJ1SG”

portar te > por’tatte “bring-OBJ2SG”

comprar je > com’prajje “buy-IND.OBJ3SG”

#### *r assimilation in Sicilian*

karni > kanni “meat”

Palermo > Palemmo

- Coronals is a broad label covering many different consonants. The group of coronal consonants do not behave the same way in all languages. There could be contrast among them.
- Some languages show that coronals contain A (cf. Scheer 1996 nasals and liquids contain A and I, coronal stops are empty).

### 2.2.2.2. The U element

- We know that labials contain |U| because in many languages they interact with round vowels, which are represented by the same element |U|.
- Headed |U| defines the natural class of labials, so it is present in labial and labialised consonants such as [ɸ b f k<sup>w</sup> m w β f ŋ v].
- In some languages, velars and labials pattern together as a natural class. This suggests that velars, like labials, contain |U| (cf. acoustic feature of Jakobson et al. [+grave]).
- The difference and the unity of labial and velars can be captured by representing labials as U headed and velars as containing a non headed U (velar weaker than labial, velar unmarkedness)

*Velar unmarkedness in the dialects of Italy:*

*Velarisation of coda nasals in northern dialects*

*Veneto*

va beŋ "ok. lit it goes well"

peŋsa "think:3SG"

*Unity of labial and velar in the dialects of Italy:*

*Altamuran*

Preceding labial and velar consonants block U fronting in closed syllable

[sYt:s] "dirtyM."            [p<sup>w</sup>ot:s] "well"

[cYm:] "lead"                [f<sup>w</sup>oŋ:]

[k<sup>w</sup>u:s:]

!!Only preceding labials block o fronting to ø

[tøst] "hard F"

[p<sup>w</sup>ort] "door"

[øm:] "man"

[f<sup>w</sup>ort] "strong F"

[køss] "thigh"

/u/ is non headed so it binds with headed and non headed U respectively in labial and velars forming a branching structure that resists fronting (element sharing= strength)

/o/ AU is U headed so it binds only with consonants with headed U to form a branching structure that resists fronting

### 2.2.2.3 The A element

- A is present in the pharyngeals [ħ ʕ] the gutturals [q ɢ χ ʁ], not present in the dialects of Italy.

#### 2.2.2.3.1 Retroflexes

- Retroflexes are A headed. In the dialects of Italy retroflexes are found in the extreme southern dialects (Siciliano, Calabrese, Salentino), Corsican, Sardinian in addition to some small parts of Tuscany, Abruzzo, Campania.

- Arguably these retroflexes are not lexical, there is a retroflex interpretation of some strong consonants or consonant clusters. Generally /l:/ has a retroflex interpretation (ɭ or ɖ) /tr/ and word-initial /r:/ have a retroflex interpretation, respectively ɭʂ and ɽ )
- Some languages show that coronals contain A (cf. Scheer 1996 liquids contain A and I).

### 2.2.2.3.2 Complex resonances

- Labiodentals and uvulars are complex resonances that contain A and U  
*Calabrese* FL > ɸ FLOREM > ɸiure
  - Labiodentals pattern with labials |U A|  
*Livornese (Tuscan)* k<sup>w</sup>esto k<sup>w</sup>i > vesto vi  
*Piemontese* kavei < CAPILLI
  - Uvulars pattern with velars |U A|
- Palatovelars are complex resonances containing A and I  
*Neapolitan, Abruzzese...* PL > c PLUS > c:u, PLUMBEUM > cumm@ ɿ (AI)

### 2.2.3 Manner elements

- No clear division between manner and laryngeal properties; collectively they are represented by the consonant elements |H L ?|.
- A I U resonance elements; H L ? non resonance

H aspiration, frication, high tone  
 L nasality, low tone, voicing  
 ? occlusion, laryngealisation, glottalic

#### 2.2.3.1 The ? element

- Occlusion, when head glottalic and implosive Cs creaky voice in vowels. The stop element [ʔ], also known as the occlusion element, is present in segments which involve a sudden and sustained drop in acoustic energy produced by an oral or glottal closure which interrupts the airflow. As a single element, [ʔ] is pronounced as a glottal stop [ʔ].

#### 2.2.3.2 The H element

- Frication. The |H| element has the effect of raising fundamental frequency, and is present in segments displaying aperiodic noise energy. Aperiodic noise is produced by high-frequency acoustic energy which is distributed fairly randomly across the upper part of the spectrum. H present in fricatives and in stops (release burst, aspiration). There are phonological reasons for assuming that released stops contain |H|. H in vowels is interpreted as High tone.

*Consonant weakening*

- The weakening process exposes any remaining elements, making them more easily identifiable because weakening always produces an expression containing a subset of the elements from the original segment



## Florentine Gorgia (Spirantisation of stops)

[p t k] weaken to [ϕ θ h]

[b d g] weaken to [β ð γ]

Delinking of the occlusion element, the remaining H must have been already there

*stops*            resonance |I U A| + noise |H| + occlusion |ʔ|

*fricatives*       resonance |I U A| + noise |H|

Other consonant weakening processes : glottaling, non-releasing, tapping, gliding, debuccalising

*Orgosolo (Sardinian)* a:ʔere “to do” < AGERE

*Val Cavallina (Lombard-Gallo-Italic)* na:h < nasum

### 2.2.3.3. The L element

- |L| is associated with low-frequency energy. In particular, the |L| element is cued by an acoustic pattern called murmur, a broad band of low-frequency energy. The easiest way of producing murmur is to lower the velum, so for this reason we tend to associate murmur with nasals, hence the term ‘nasal murmur’. And because |L| represents nasal murmur, the element itself is often called the nasal element.

## 2.3 Laryngeal contrast

- |H| and |L̥| can be used to express laryngeal contrast: headed H as voicelessness or aspiration, headed |L̥| stands for obstruent voicing.
- The dialects of Italy, generally have |L̥| as their active laryngeal element, and belongs to the group of L languages or ‘voicing languages’; other L languages include Spanish, Russian, Japanese and Dutch. English with headed |H| belongs to the group of H languages or ‘aspiration languages’
- Salentino and Calabrese display a somewhat different pattern. They feature postnasal aspirate stops

*S. Maria di Leuca (Salentino)* dent<sup>h</sup>i “teeth”

- Salentino “devoices” obstruents apart from the RS contexts.  
*Salentino* kustu “taste”, tittu “said” cf. St. Italian gusto, detto  
addʒu dda:re “I must give”

### Summary

headed |L̥|:    with |H|            full voicing in fricatives  
                  with |ʔ H|        full voicing in stops  
                  in vowels            low tone

non-headed |L|: in Cs            nasal murmur in nasals  
                  in Vs            nasality

## 2.5 Nasals

In some languages nasals contain ?

Postnasal voicing is a phonological effect that highlights the link between nasality and obstruent voicing. In languages with postnasal voicing, an obstruent must be voiced when it follows a nasal. L assimilation

Southern dialects

pondə “bridge” cf. St. Italian ponte

angorə “again” cf. St. Italian ancora

!/l/ drives obstruent voicing and assimilation in Southern dialects

*Barese* aldə “tall” cf. St. It alto‘

## 2.6 Liquids

r A glide

l AI/ AU glides

Velar /l/ vocalisation to /w/ in the Dialects of Italy

*Southern dialects* FALCEM > fautʃə

*Campidanian Sardinian* the contrast between *l* and *r* in Latin neutralised to *r* in onset clusters. This left the descendant Sardinian with just one liquid, for example *plus* (Lat.) > [ˈprus] ‘more’, *frater* (Lat.) > [ˈfradi] ‘brother’.

/l/ contains I *Florentine* PLENUM > pjeno “full” al > ai “to the”

/l/ > /r/ *Romanesco* IL > er,

*Abruzzese* PLENUM preno “full, pregnant”

*Evidence for liquids as a phonological class*

In some localities of Garfagnana (Tuscany) mid vowels are raised by word-final /i u/ only if the intervening vowel is a liquid.

[ˈkavolo] [ˈkavuli] ‘cabbage/s’

[ˈandʒelo] [ˈandʒili] ‘angel/s’

[ˈalbero] [ˈalberi] ‘tree/s’

San Oreste (Lazio) the penultimate vowel of proparoxytones is always [i] except when the following consonant is a liquid, which allows total harmony

[ˈsabbitu] It. [sabato] ‘Saturday’

[ˈskommoda] It. [ˈskomoda] ‘uncomfortable-FEM.’

[ˈstommiku] It. [ˈstomako] ‘stomach’

[ˈtrapinu] It. [ˈtrapano] ‘drill’ (intervening non-liquid consonant)

[ˈarbulu] [ˈarbili] ‘tree/s’

[ˈdʒenuru] [ˈdʒeniri] ‘son-in-law/sons-in-law’

[ˈdukulu] ‘educate him’

[ˈdukala] ‘educate her’

[ˈdukele] ‘educate them-FEM.’

[ˈdukili] ‘educate them-MASC.’ (intervening liquid consonant)

Scheer 1996: Liquids contain A and I

*Sic. Kanni* (Palermitano and Trapanese) kainni *St. Italian* karne “meat”

Sic. *Kuittu* (Palermitano and Trapanese) *kuittu St. Italian korto* “short”

## 2.7 Complexity

- In GP syllabification is a function of the internal structure of segments. Why is it so?

*Segments are assigned to sonority classes on the basis of their distribution within the syllable, but syllabification itself, the syllabification algorithm, is usually formulated in terms of sonority”* (Walther 1993:60)

- Harris (1990) introduces the important notion of segmental complexity.
- The complexity of a segment is calculated by simply counting the melodic primes that contribute to its articulation.
- The governing relations between adjacent consonant segments that derive syllabic structure in Harris (1990) depend on the notion of complexity
- Harris (1990) proposes that the effect observed (i.e. lesser or greater sonority) is a function of the number of the phonological primes that contribute to the articulation of a consonant: the more complex a consonant is (the more primes contribute to its articulation) the less sonorous it is (and the better governor it will be.
  - This is the first attempt to break up the circular definition of sonority:
  - Complexity is argued for on grounds (lenition) that are completely independent of the set of observations that make a consonant a sonorant or a non-sonorant

### Sonority in Scheer 1996

Segment	Nucleus/Onset	h/?	role of A	sonority
a	N	-	head	↑
e,o	N	-	operator	
u,i	N	-	absent	
liquids	O	-	head	
nasals	O	-	head/op	
glides	O	-	absent	
s,z	O	h	head	
gutturals	O	h	head/op	
fricatives	O	h	op/absent	
stops	O	h and?	Absent	

- Only place definers count for complexity. Sonorants are more complex than obstruents.

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To be handed out

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### **Harris 94**

### **Harris lindsey**

### **Scheer**

### **Savoia gorgia**

Canalis

(Venturelli 1979: 104) (Elwert 1958)

Passino D. Epenthesis, syllable structure and the phonology/morphology interface in Teraman  
Abruzzese Ms