

Testing Parametric Comparison against ultralocality

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UNIMORE
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MODENA E REGGIO EMILIA

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The Parametric Comparison Method

*Theoretical syntax may provide **unexpected evidence for phylogenetic issues** typical of the historical-comparative paradigm*

*Formal grammar [...] can be construed as a potential **contribution to the study of the human past***

[Longobardi and Guardiano 2009: 1679]

Kraus (1787): **syntax** is likely to be *similar* even in unrelated languages

Adelung (1806-17, I, Vorrede xii f.): for the purposes of genealogical classification it is *useless to compare grammatical features* across languages because these could be shared by many different languages
(Adapted from Morpurgo Davies 1992: 51)

Greenhill et al (2017):

Most **grammatical features** actually *change faster* than items of basic vocabulary. [...]
Our finding that structural features evolve more rapidly than basic vocabulary is *incompatible with hypotheses proposing extremely deep signal in grammatical features*

*In fact it is quite possible – even likely – that **English grammars might be more similar to grammars with which there is less historical connection.***

From this perspective, looking at the parameters in the current linguistic literature, English grammars may be more similar to Italian than to German, and French grammars may be more similar to German than to Spanish.

There is no reason to believe that structural similarity should be even an approximate function of historical relatedness

[Anderson and Lightfoot 2002: 8-9]

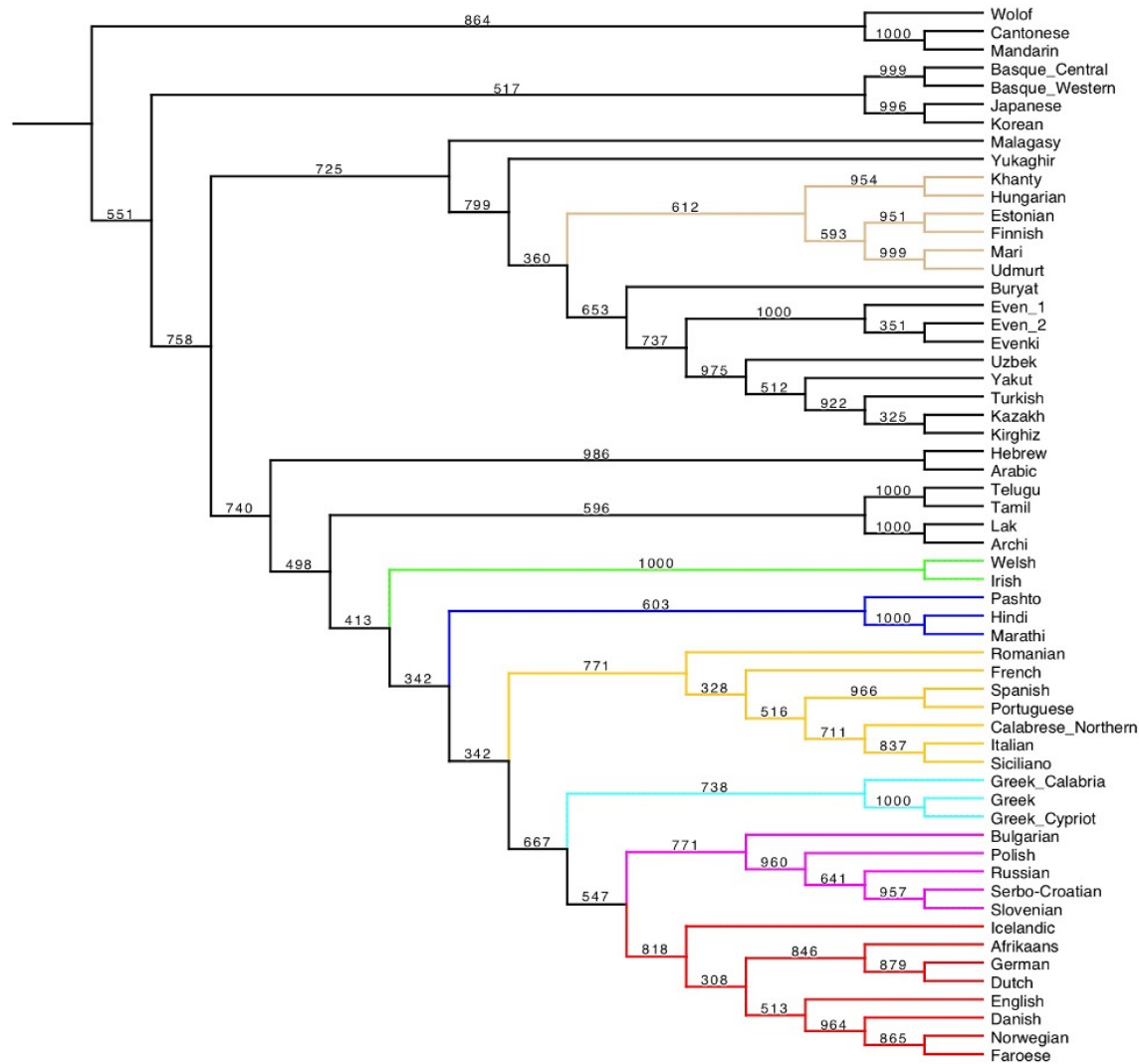
Mesocomparison

Humboldt's problem

[Longobardi and Guardiano 2009]

*Is there any **significant correspondence** between classifications of languages based on **lexical etymologies** and those based on **syntactic rules**?*

UPGMA bootstrapped tree from parametric Jaccard distances



21/24 = 87.5%

Sinitic	YES
Basque	YES
Finno-Ugric	YES
Ugric	YES
Balto-Finnic	YES
Tungusic	YES
Turkic	YES
Kipchak	YES
Semitic	YES
Dravidian	YES
NE-Caucasian	YES
IE	YES
Celtic	YES
Indo-Iranian	YES
Indo-Aryan	YES
Romance	YES
Ibero-Romance	YES
Greek	YES
Slavic	YES
South-Slavic	NO
Germanic	YES
North Germanic	NO
West Germanic	NO
Continental West-Germanic	YES

Mesocomparison

Humboldt's problem

[Longobardi and Guardiano 2009]

*Is there any **significant correspondence** between classifications of languages based on **lexical etymologies** and those based on **syntactic rules**?*



Homology conjecture

[Ceolin et al 2020]

*Syntactic and lexical histories provide **the same evolutionary topologies** once interference is equally taken into account*

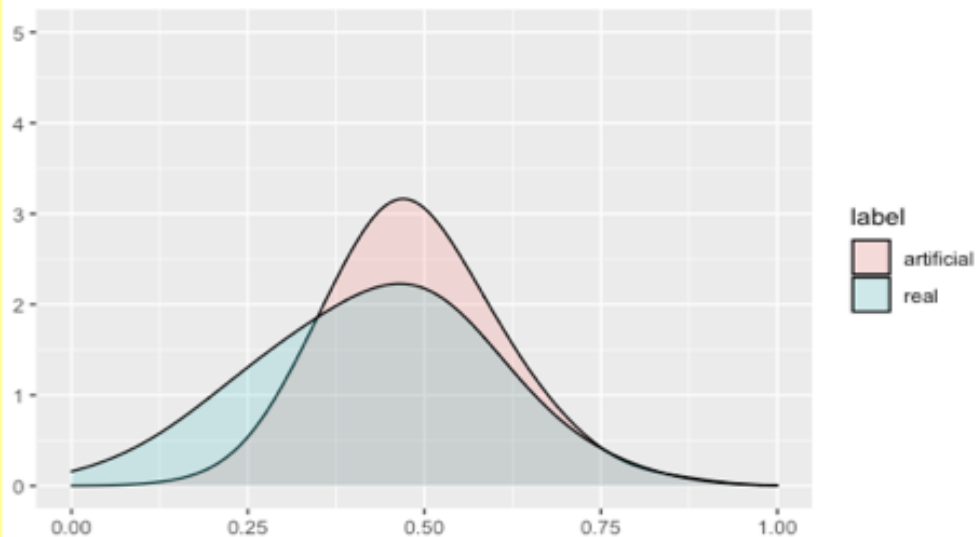
Macrocomparison

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At the boundaries of syntactic prehistory

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Monica Alexandrina Irimia¹, Luca Bortolussi³ and Andrea Sgarro³



Chance threshold: 0.3

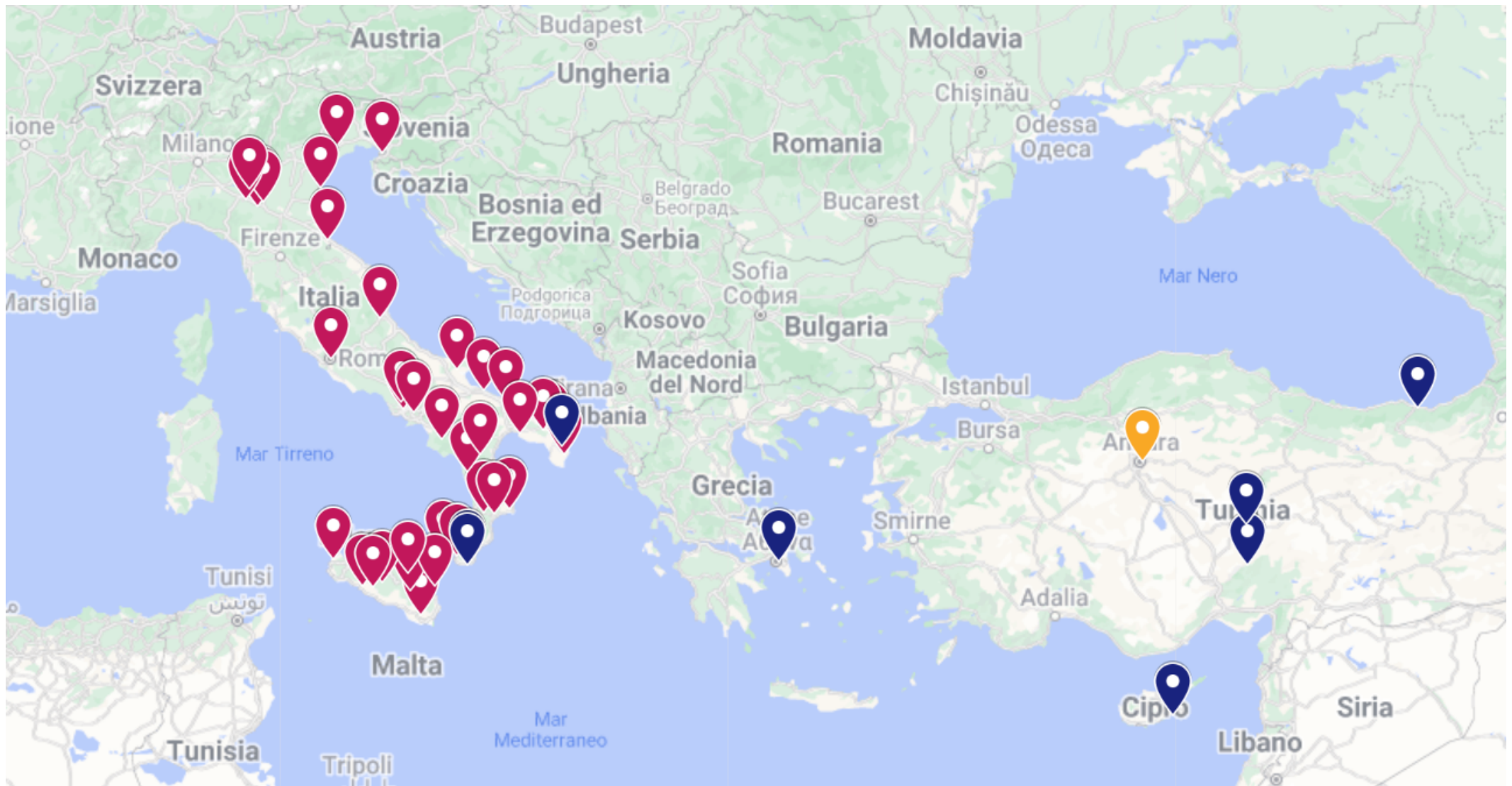
- **Japanese/Korean** = 0.182
- **NE-Caucasian/Dravidian** = 0.263
- **Turkic/Tungusic** = 0.158
Turkic/Tungusic/Buryat = 0.223
- **Finno-Ugric/Altaic** = 0.307
- East Asia and Basque = very much removed from all other Eurasian families

Meso-/Macro-comparison

- Syntactic change is **slow enough** to allow for **historically informative classification of languages**
- Syntax is robustly **phyletic** >> not affected by areal proximity/secondary convergence
- Syntax is sometimes **more** informative than classical etymological methods:
 - **Strong thesis** of phylogenetic syntax: the more invisible and abstract the traits used in comparison, the higher their historical informative value
- The **PCM** is the continuation of the historical comparative paradigm “with other means”

Microcomparison

- Peculiar **sociolinguistic settings**: small speaking communities, (often) endangered languages, heritage speakers, unbalanced interference of “dominant” languages
- Prolonged **contact** in the same small/compact geographical area(s)
- **Two scenarios**
 1. *More than one different ancestor*. Languages belonging to different groups of the same family (or to different families)
 2. *Monophyletic domain*. Languages sharing one and the same “recent” ancestor





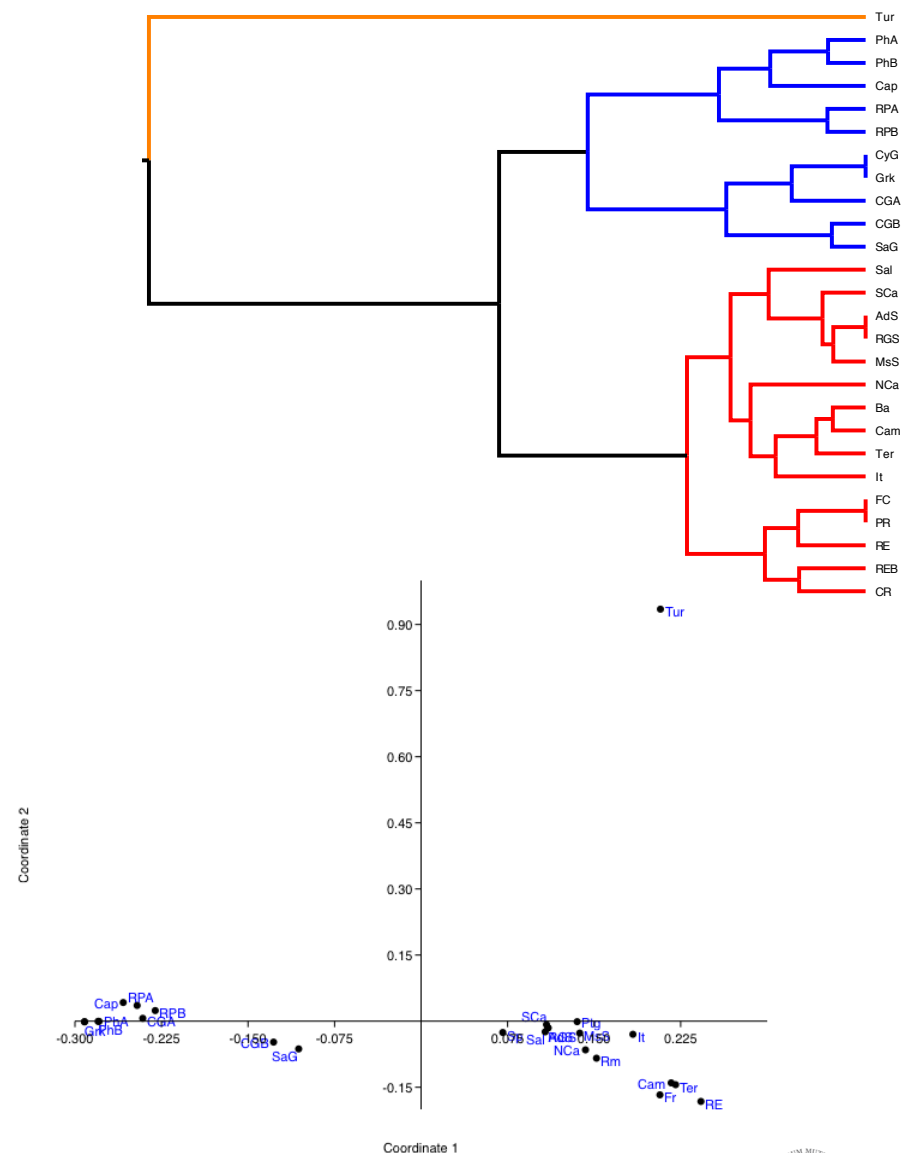
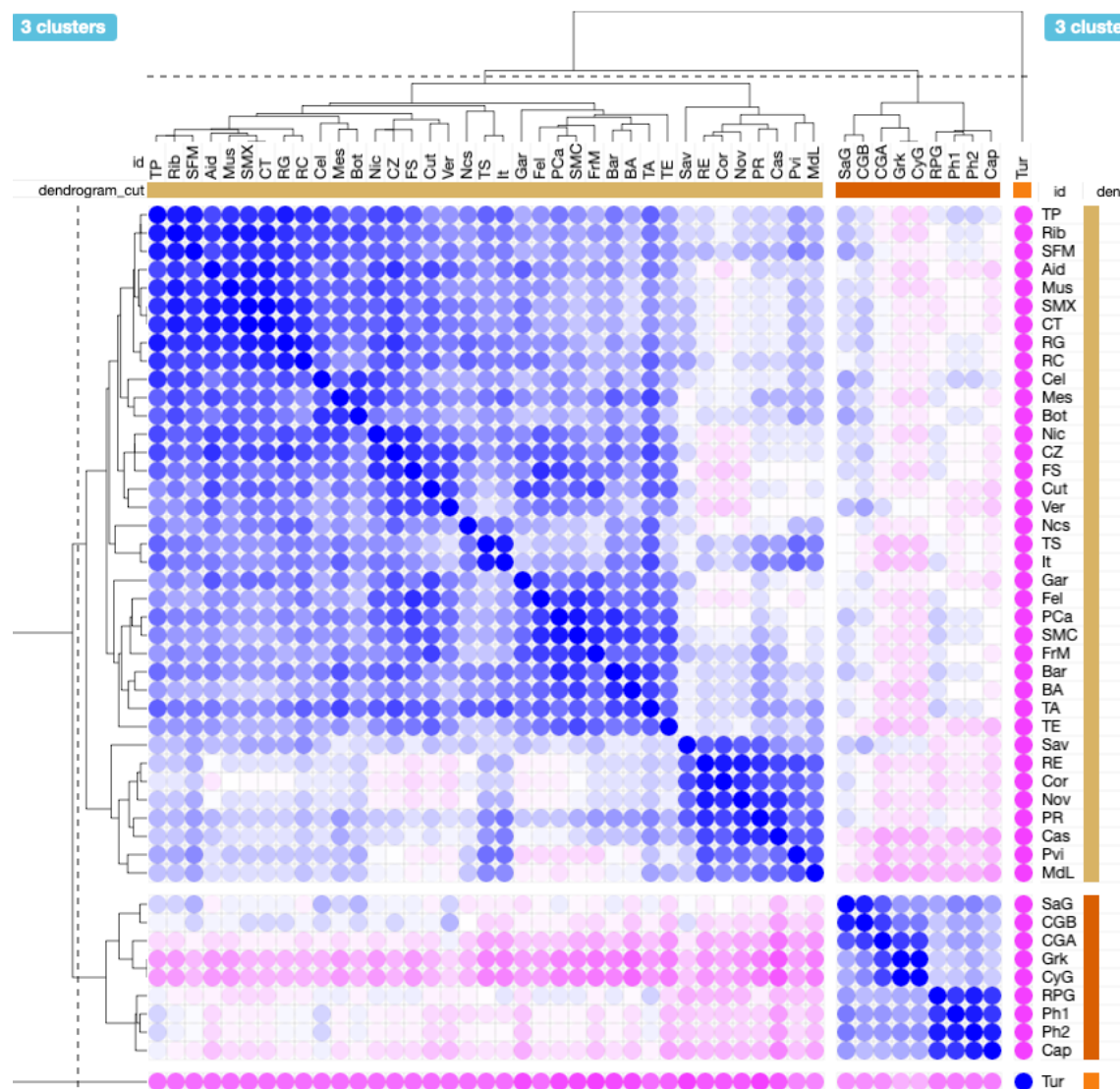
A pilot dataset

- **36** Romance dialects of Italy
 - 14 Extreme Southern
 - 11 Upper Southern
 - 2 Gallo-Italic of Sicily
 - 6 Gallo-Italic of Emilia, Lombardia and Romagna
 - 3 Venetian
- Italian
- 3 Greek dialects of southern Italy

Scenario (1): Greek in Italy and Asia Minor

- ☑ Syntax retains a **horizontal signal**
[Guardiano and Stavrou 2014, 2019, 2020, 2021]
- ☑ Changes induced by contact seem to obey principles of **resistance**
[Guardiano et al 2016, 2020, Guardiano and Stavrou 2021]
- ☑ The identified instances of **plausible syntactic borrowing** **never disrupt the genealogical signal**
- ☑ Classifications resulting from syntax parallel widely accepted phylogenetic information (Guardiano et al 2016)
- ☑ Syntax retains a **significant vertical signal**

Scenario (1): Greek in Italy and Asia Minor



Scenario (2): Romance dialects in Italy

*Is it possible to map the **dialectal structure** of
a specific ultralocality domain
through quantitative procedures **using syntax**?*

1. Does the PCM capture **any signal** at this level?
2. If yes, is it possible to identify **aggregations of dialects** (i.e., syntactic isoglosses)?
3. To what extent do these aggregations **correlate with other variables**?

Putting the PCM into execution

- A. Generating a **system of parameters** and set them in the languages to be compared
- B. **Measuring parametric similarity** across languages and exploiting their **classification** through quantitative and statistical tools

Label	Parameter	
1	FGM	1 grammaticalized morphology
2	FGA	1 grammaticalized agreement
3	FGK	1 grammaticalized Case
4	SPK	1 grammaticalized [ultra-]spatial Cases
5	FSP	1 grammaticalized person
6	FSP	1 semantic person
7	FDN	1 grammaticalized number
8	SCD	1 spread collective number
9	GDP	1 grammaticalized distributive plurality
10	FSN	1 number spread to N
11	FWN	1 number on N
12	FTT	1 grammaticalized temporality
13	FGG	1 grammaticalized gender
14	FSG	1 semantic gender
15	GGB	1 unbounded sg N
16	FPC	1 grammaticalized perception
17	DGR	1 grammaticalized Specified Quantity
18	GDP	1 grammaticalized text anaphora
19	GDP	1 week Spread
20	WWD	1 week Spread
21	FVP	1 variable person
22	GDD	1 grammaticalized distality
23	DPO	1 free null partitive Q
24	DCN	1 article-checking N
25	DNN	1 null-N in D
26	DNN	1 D-control on N
27	FGC	1 grammaticalized classifier
28	FGE	1 general classifier
29	FCN	1 person spread to predicate nouns
30	HNMP	1 NP-heading modifier
31	ARR	1 free reduced relatives
32	GCN	1 head-marking
33	FCN	1 Person control on N
34	FGP	1 agreement with all persons
35	GPS	1 agreement with all 3rdPers DPs
36	GAI	1 genitive inversion
37	CSE	1 full c-selection
38	CAL	1 negative alignment
39	CAL	1 clausal alignment
40	LKA	1 argument linker
41	LKO	1 oblique linker
42	LKP	1 predicative linker
43	DMP	1 def matching pronominal possession
44	DMG	1 def matching genitive
45	GUN	1 uniform genitive
46	GAD	1 free Gen
47	GFL	1 Gent.
48	GGL	1 partial Gent.
49	GGR	1 generalized Gent
50	GSI	1 grammaticalized inalienability
51	ALP	1 alienable possession
52	GIT	1 genitive-licensing iteration
53	UST	1 unstructured modifiers
54	GPC	1 gender polarity cardinals
55	PSC	1 plural spread from cardinal quantifiers
56	PCA	1 plural spread through cardinal adjectives
57	PMN	1 person marking on numerals
58	HMM	1 head marking on relative clauses
59	PRC	1 finite relative clauses
60	NRC	1 participial relative clauses
61	DCR	1 def on relatives
62	PTP	1 feature spread to particles
63	NUP	1 NP under non-genitive arguments
64	PNP	1 complement under P
65	NUD	1 NP under D
66	NUC	1 N under cardinals
67	NN1	1 N under M1 As
68	NN2	1 N under M2 As
69	NNA	1 N under As
70	NGL	1 N under Gent.
71	CAF	1 fronted High As
72	ACM	1 class MOD
73	DSN	1 def spread to N
74	DSR	1 def spread to ARR
75	DSG	1 def spread to structural categories
76	DOC	1 def on cardinals
77	NEX	1 Proper names in D
78	PEX	1 Personal proper names in D
79	PEX	1 Partial personal proper names in D
80	POC	1 D-checking possessives
81	PCL	1 clitic possessives
82	APD	1 adjectival possessives
83	WAP	1 Wackernagel possessives
84	AGE	1 adjectival genitive
85	OPK	1 null possessive licensing article with kinship nouns
86	TSP	1 split deictic demonstratives
87	TDP	1 split demonstratives
88	TDC	1 D-checking demonstratives
89	TSA	1 structured demonstratives (adjectival)
90	TAR	1 unstructured demonstratives
91	TLC	1 Dem fronting to Loc
92	TND	1 long distance D-checking demonstratives
93	TDA	1 split def on adjectival demonstratives
94	TNL	1 DP under Loc
Label	Parameter	

Preparing the parameter dataset

1. Select a set of parameters for one (or more) well-defined module(s) of grammar (Longobardi's 2003 MGP)
 - **DP-module: 94** parameters from recent PCM datasets [Ceolin et al 2020, 2021] + **14** additional ones capturing aspects of internal variation among the dialects of the dataset = **108 DP-parameters**

1. D-domain

2. Genitives and linkers

3. Numerals, relative clauses and **adjectival modifiers**

4. Pronominal possessives

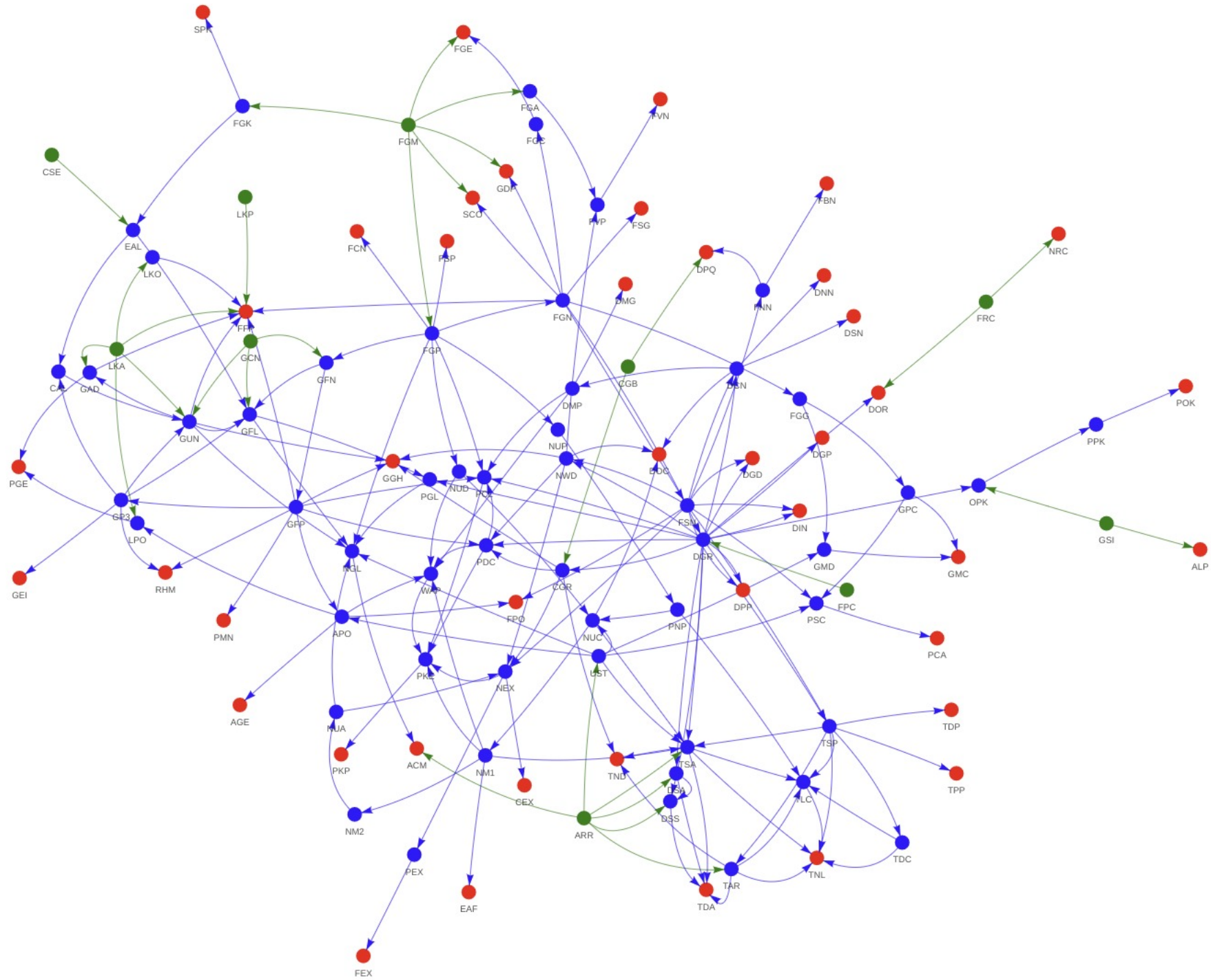
5. Demonstratives

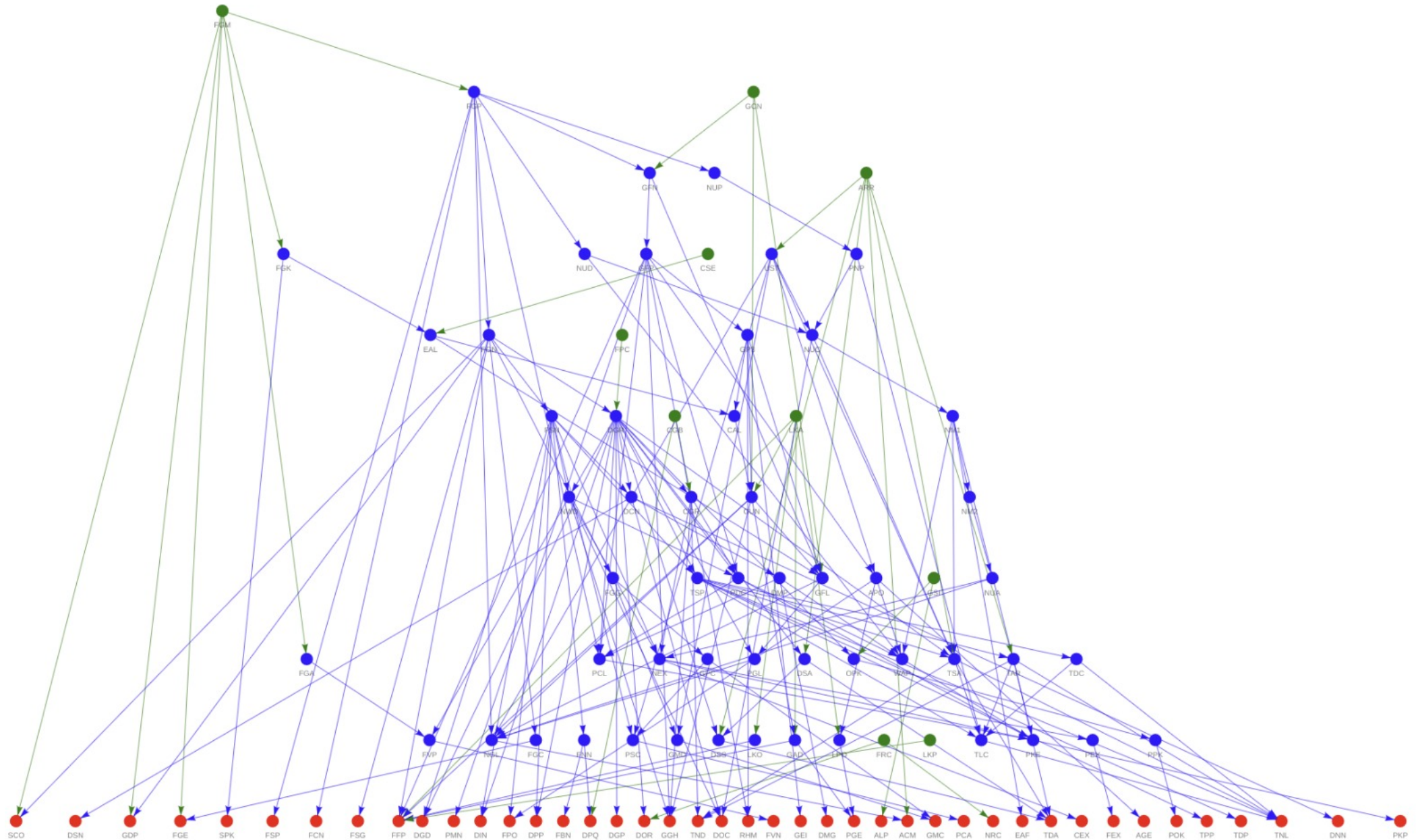
Preparing the parameter dataset

1. Select a set of **parameters** for one (or more) well-defined module(s) of grammar (Longobardi's 2003 MGP)
2. **Define** a set of **implicational formulas** expressing the logical or functional interdependencies among parameters
 - Control for **redundant** information (some parameter values are entirely *predictable* from others)

1419/4320 neutralized states

Performed by A. Artioli and L. Mariotti





Preparing the parameter dataset

1. A set of **parameters** for one (or more) well-defined module(s) of grammar
2. A set of **implicational formulas** expressing the logical or functional interdependencies among parameters
3. A set of **manifestations** for each parameter
 - the set of **co-varying surface patterns** observed in the language if the parameter is active (positive evidence to set a parameter)

Parameter FGN, Grammaticalized Number

M1	morphological alternations on nominal arguments (on the head noun or a definite article/demonstrative/quantifier/adjective) that oppose singular to non-singular interpretation	cat, cat s questo o , questi i lupo o , lupi i tutto o , tutti i
M2	morphological alternations on the verb that depend on the singular/non-singular interpretation of the subject	dog s bark, the dog bark s il gatto miagola a , i gatti miagolano o
M3	morphological alternations on adjectives that depend on the singular/non-singular interpretation of the noun (or of the definite article/demonstrative/quantifier)	il gatto bianco i gatti bianchi
M4	morphological alternations on 3rd person reflexives that depend on the singular/non-singular interpretation of the subject	that boy loves himself, those boys love themselves quel ragazzo adora se stesso o , quei ragazzi adorano se stessi i

Preparing the parameter dataset

1. A set of **parameters** for one (or more) well-defined module(s) of grammar
2. A set of **implicational formulas** expressing the logical or functional interdependencies among parameters
3. A set of **manifestations** for each parameter
 - the set of **co-varying surface patterns** observed in the language if the parameter is active (positive evidence to set a parameter)
4. A procedure for **setting parameter values** from the empirical evidence available [Crisma et al 2020]

Parameter FGN, Grammaticalized Number, *Italian*

	Question	Example	Answer	Value
Q1	Do you find morphological alternations on nominal arguments (on the head noun or a definite article/demonstrative/quantifier/adjective) that oppose singular to non-singular interpretation?	questo gatto questi gatti	YES	+
Q2	Do you find morphological alternations on the verb that depend on the singular/non-singular interpretation of the subject?	il gatto miagola i gatti miagolano	YES	
Q3	Within nominal arguments, do you find morphological alternations on adjectives that depend on the singular/non-singular interpretation of the noun (or of the definite article/demonstrative/quantifier)?	il gatto bianco i gatti bianchi	YES	
Q4	Do you find morphological alternations on 3rd person reflexives that depend on the singular/non-singular interpretation of the subject?	il gatto adora se stesso i gatti adorano se stessi	YES	

Parameter FGN, Grammaticalized Number, *English*

	Question	Example	Answer	Value
Q1	Do you find morphological alternations on nominal arguments (on the head noun or a definite article/demonstrative/quantifier/adjective) that oppose singular to non-singular interpretation?	cat, cat s	YES	+
Q2	Do you find morphological alternations on the verb that depend on the singular/non-singular interpretation of the subject?	dog s bark, the dog barks	YES	
Q3	Within nominal arguments, do you find morphological alternations on adjectives that depend on the singular/non-singular interpretation of the noun (or of the definite article/demonstrative/quantifier)?	/	NO	
Q4	Do you find morphological alternations on 3rd person reflexives that depend on the singular/non-singular interpretation of the subject?	that boy loves himself , those boys love themselves	YES	

Preparing the parameter dataset

1. A set of **parameters** for one (or more) well-defined module(s) of grammar
2. A set of **implicational formulas** expressing the logical or functional interdependencies among parameters
3. A set of **manifestations** for each parameter
 - the set of **co-varying surface patterns** observed in the language if the parameter is active (positive evidence to set a parameter)
4. A procedure for **setting parameter values** from the empirical evidence available [Crisma et al 2020]
 - **[+]** parameter P >> **addition** of a rule to the grammar
 - **[-]** parameter P >> “nothing happens” (no rule is added to the grammar)
 - **[0]** parameter P >> implicational condition not satisfied (the value of P is ***predictable***)

Data collection and storage

Language	Parameter_Lab	Parameter_Name	Parameter_implication conditions	Question_ID	Question	Question_Preconditions	Question_Instructions	Question_Definitions	Language_Relevant	Question_Parameters	Question_Examples	Example_Gloss	Example_Translation	Language_References	Language_Comments	
Ragusa	FGM	grammaticalized morphology	/	FGM_Qa	Does the language have affixes or regular phonological alternations that	/	Is there derivational morphology?	/	/	YES	+	1. kaminu	1. walk	1. path		
Ragusa	FGM	grammaticalized morphology	/	FGM_Qb	Are there roots which take different affixes/alternations encoding different	/	Is there inflectional morphology?	/	Gender. Pick a morphologically or lexically definable noun class,	YES	+	1. varka	1. boat.F.S	1. boat		
Ragusa	FGM	grammaticalized morphology	/	FGM_QCa	Are there roots which appear with no affix/alternation encoding different	/	For each root, you must identify two	YES --	Gender. Pick a morphologically or lexically definable noun class,	/	NO	/	1. varka	1. boat.F.S	1. boat	
Ragusa	FGA	grammaticalized Agreement	+FGM	FGA_Qa	Is there any feature occurring on a word which must take its value I agree	/	Examples like the following ones can be	/	+FGM	YES	+	1. na varka mrua	1. a F boat.F.S red.F.S	1. a boat		
Ragusa	FGA	grammaticalized Agreement	+FGM	FGA_QCa	Pick the first 10 verbs and the first 10 adjectives appearing in the text. Does	/	YES --	/	/							
Ragusa	FGK	grammaticalized Case	+FGM	FGK_Qa	Pick a personal or relative pronoun. Does its morphology vary according to its	/	Examples like the following ones can be	Case morphology	+FGM	YES	+	1. lu viru a tta/vi viru	1. 15.NOM.see.15.DOM.25.ACC / 25.ACC.CJ.see.15	1. I see you		
Ragusa	FGK	grammaticalized Case	+FGM	FGK_Qb	Pick a quantifier, a demonstrative or a definite/indefinite article. Does the	/	Examples like the following German ones	Article. It is used to refer to a determiner that does not express any	+FGM	NO	/	1. vittu o picciriddu	1. saw.15 A.the M.S kid M.S	1. I saw the kid		
Ragusa	FGK	grammaticalized Case	+FGM	FGK_Qc	Pick a noun. Does its morphology vary according to its syntactic role?	/	Examples like the following one from	Case morphology	+FGM	NO	/	1. vittu o picciriddu	1. saw.15 A.the M.S kid M.S	1. I saw the kid		
Ragusa	FGK	grammaticalized Case	+FGM	FGK_QCa	Do speech-role designating items (i.e. first, second and third person singular	/	/	Case morphology	+FGM	NO	/	1. lu viru a tta/vi viru	1. 15.NOM.see.15.DOM.25.ACC / 25.ACC.CJ.see.15	1. I see you		
Ragusa	SPK	grammaticalized (sub)spatial Cases	+FGK	SPK_Qa	Are there spatial Case distinctions in addition to static location, direction and	/	Examples like the following Hungarian	Case morphology	+FGK	NO	/	1. vaju a skola	1. go.15 to.the F.S school.F.S	1. I go to school	No case morphology on nouns (see FGR_Qc)	
Ragusa	SPK	grammaticalized (sub)spatial Cases	+FGK	SPK_QCa	Are locative meanings other than static, direction, or source expressed by	/	Examples like the following Italian ones can	Case morphology	+FGK	YES	-	1. vaju a skola	1. go.15 to.the F.S school.F.S	1. I go to school	No case morphology on nouns (see FGR_Qc)	
Ragusa	FSP	grammaticalized person	+FGM	FSP_Qa	Is there agreement in speech-role designating morphology between a verb	/	Examples like the following ones can be	/	+FGM	YES	+	1. Giovanni kantau na kanturi	1. Giovanni sang.35 a F song.F.S	1. Giovanni sang a song		
Ragusa	FSP	grammaticalized person	+FGM	FSP_Qb	Are there overt expletive items in subject function?	/	Do not use an 'accidental' construction	/	+FGM	NO	/	1. pari lu avaiu a cagnu	1. seem.35 that have.35 to rain	1. it seems that it's going to rain		
Ragusa	FSP	grammaticalized person	+FGM	FSP_Qc	Are there overt resumptive items in (direct or indirect) object function?	/	Examples like the following Italian one	/	+FGM	YES	+	1. i scacci d'acqua i kuttai	1. the P scacci P there 3P.ACC.CJ bought.15	1. I bought the scacc over there		
Ragusa	FSP	grammaticalized person	+FGM	FSP_Qd	Pick an item that can be a referentially independent pronoun. Can it also occur	/	Examples like the following ones can be	/	+FGM	YES	+	1. pigghiu a iddu	1. catch.3P DOM 35.M	1. they catch him		
Ragusa	FSP	grammaticalized person	+FGM	FSP_Qe	Do speech-role designating items precede adjectives?	There are adjectives/numerals obligatorily	To test this question, you can use the	Speech role. It refers to the semantic interpretation of a nominal	+FGM	YES	+	1. (i) tri picciotti	1. the P three guy.P	1. (the) three guys	since there are no pronominal adjectives, a no	
Ragusa	FSP	grammaticalized person	+FGM	FSP_Qf	Do nominal arguments with a cardinal numeral following a possessive, an	There is no article	Examples like the following Polish ones	Article. It is used to refer to a determiner that does not express any	+FGM	NA	/	/	/	/	Precondition not satisfied	
Ragusa	FSP	grammaticalized person	+FGM	FSP_Qg	Are there speech-role designating morphemes alternating between a stressed	/	Examples like the following Italian one	/	+FGM	YES	+	1. lu viru a tta/vi viru	1. 15.NOM.see.15.DOM.25.ACC / 25.ACC/DAT.CJ.see.15	1. I see you		
Ragusa	FSP	grammaticalized person	+FGM	FSP_Qh	Are there common nouns that can occur bare in non-argument function while	/	Do not use vocatives to answer this	Bare Noun. A noun (or its extended maximal phrase) not introduced	+FGM	YES	+	1. Giovanni e dotturi	1. Giovanni be.35 doctor	1. Giovanni is a doctor		
Ragusa	FSP	grammaticalized person	+FGM	FSP_Qi	Are there proper names that can occur bare in non-argument function, while in	/	When answering this question, try various	Bare Noun. A noun (or its extended maximal phrase) not introduced	+FGM	YES	+	1. sta skavata si chiama Juventus	1. this.F.S team.F.S Si call.35 Juventus	1. this team is named Juventus		
Ragusa	FSP	grammaticalized person	+FGM	FSP_Qj	Are nominal arguments with understood maximality derivation (definiteness)	/	Examples like the following English ones	Article. It is used to refer to a determiner that does not express any	+FGM	YES	+	1. pigghia l'abbissu (n'abbissu), e	1. take.15.PST the M.S bus.M.S (a M bus.M.S) and	1. I took a bus. The driver asked me for the ticket		

- **108 parameters** ➔ **257 manifestations**
- For each pattern, a minimum of **3** examples were elicited from (at least) one native speaker per dialect (including ungrammatical patterns, when possible). ➔ about **30,000** examples
- Each manifestation is associated to a YES if the speaker produced the relevant examples, to a NO if the pattern is not available (or ungrammatical).
- Data are currently collected on **Google Sheets / .xls files**

40 strings, 108 parameter states (+, -, 0)

[illegible]

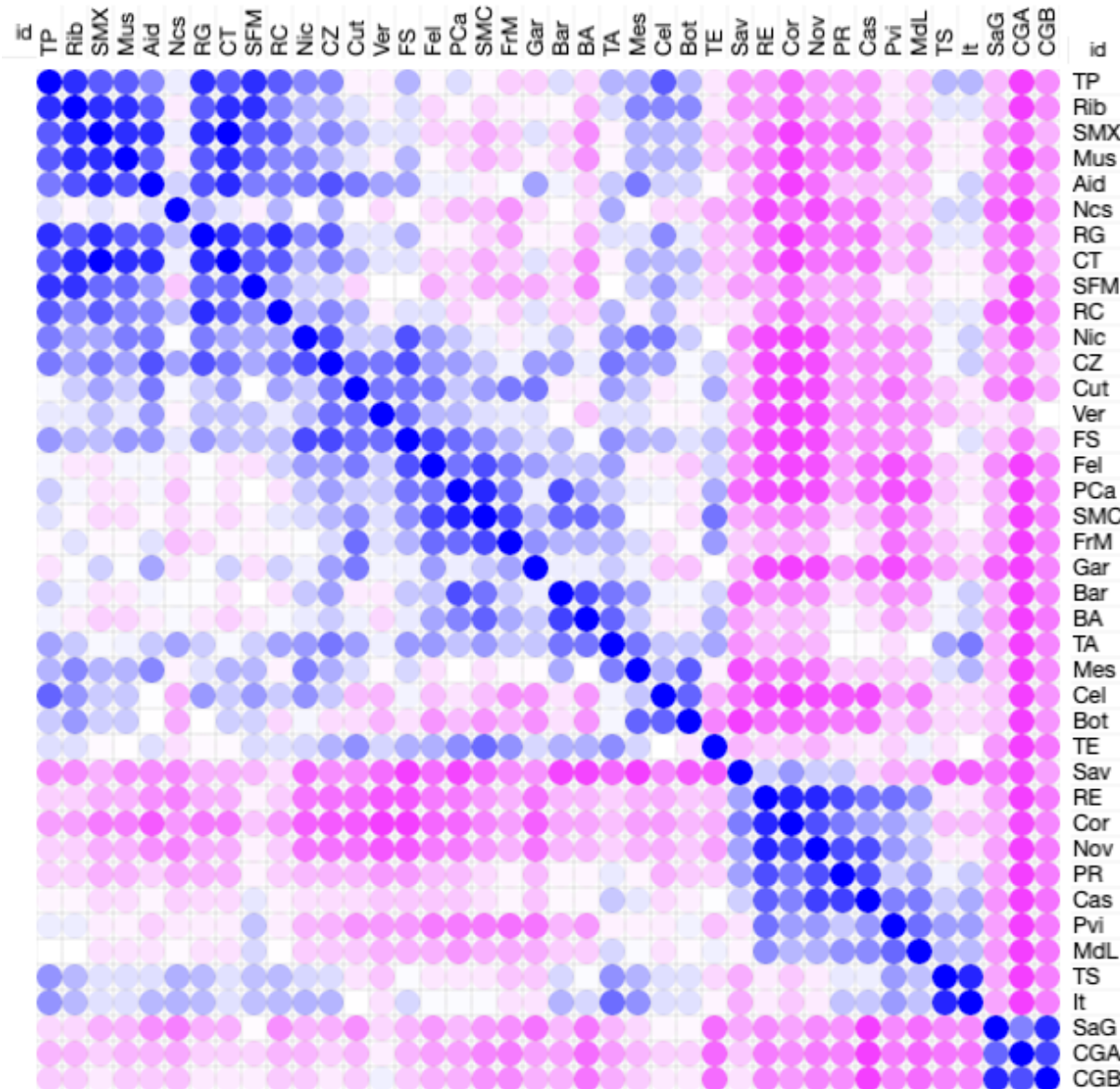
Putting the PCM into execution

- A. Generating a **system of parameters** and set them in the languages to be compared
- B. **Measuring parametric similarity** across languages and exploiting their **classification** through quantitative and statistical tools

Measuring parametric similarity

- Cross-dialectal similarity was measured through the assessment of **distances (dialectometry)**: Nerbonne et al 2011, Nerbonne and Kretzschmar 2012, Leinonen et al 2016)
- Computing the number of identities (*i*) and differences (*d*) in the parameter states of each pair of dialects
- Reducing them to a monadic figure through the Hamming formula
 - **D Hamming** = $[d/(i+d)]$

The distribution of syntactic distances

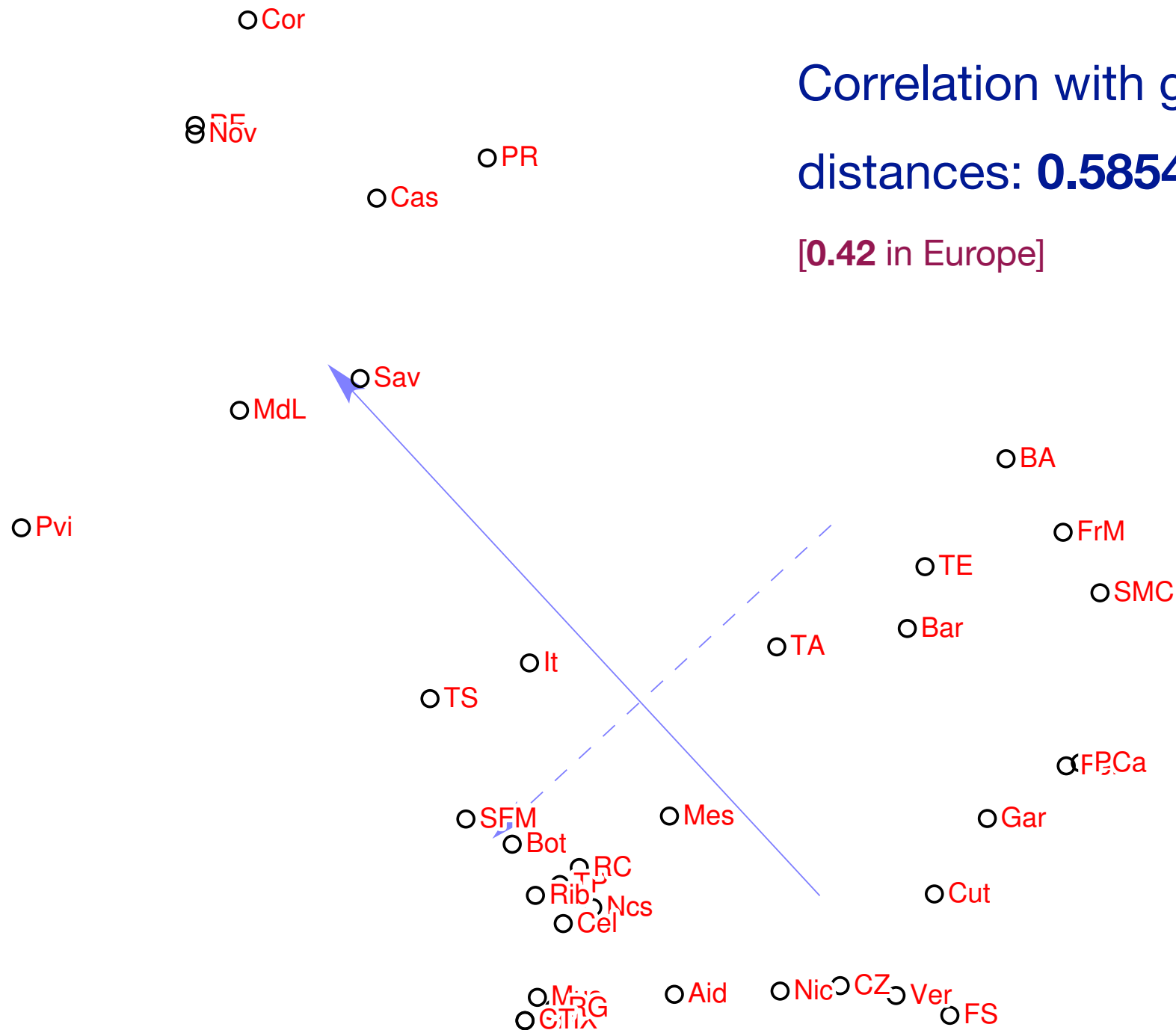


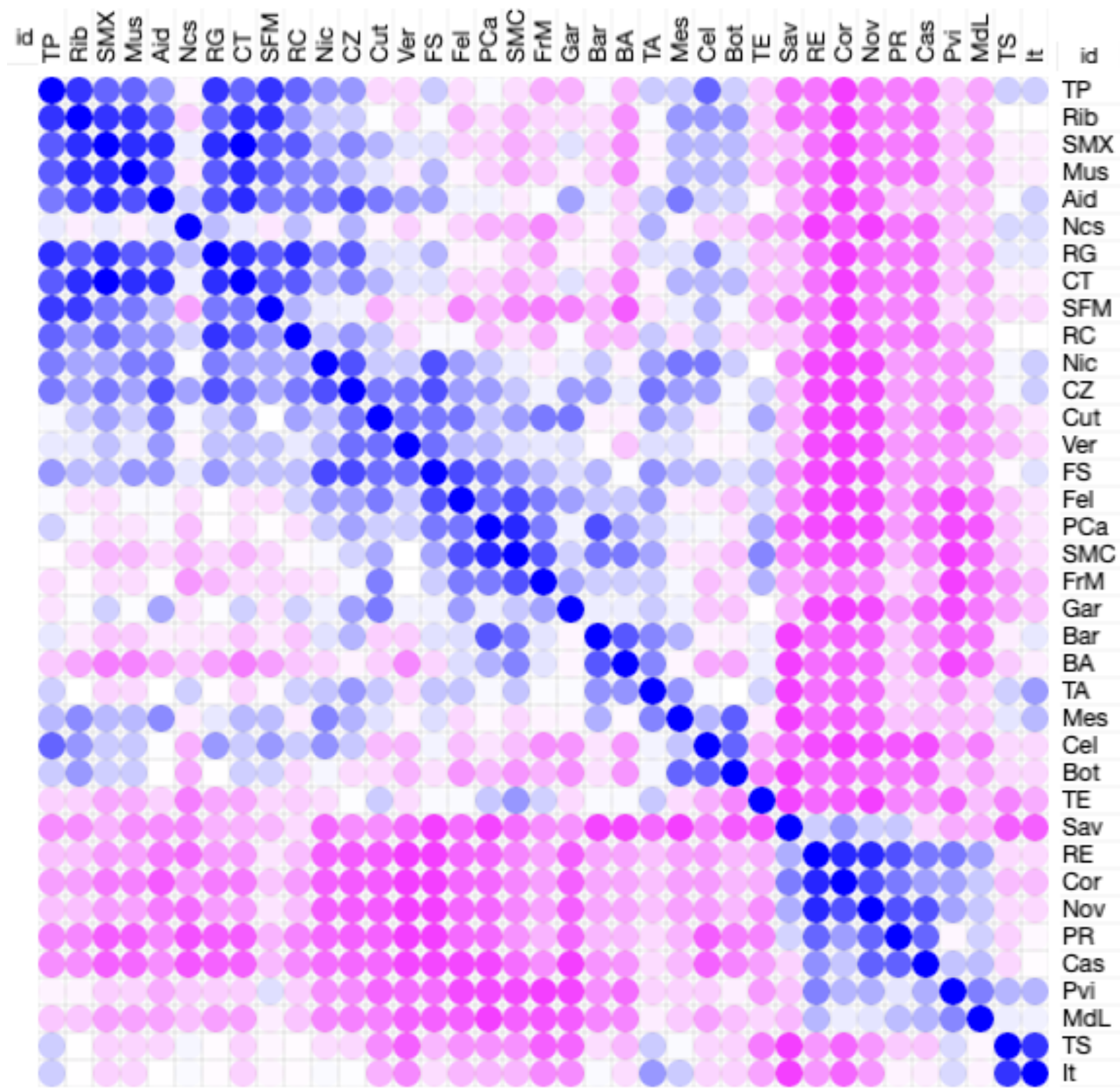
- Distances range between **0.013** and **0.230**
- Between 0.013 and **0.188** within Romance

<https://software.broadinstitute.org/morpheus/>

Correlation with geographic
distances: **0.5854** (Pearson)

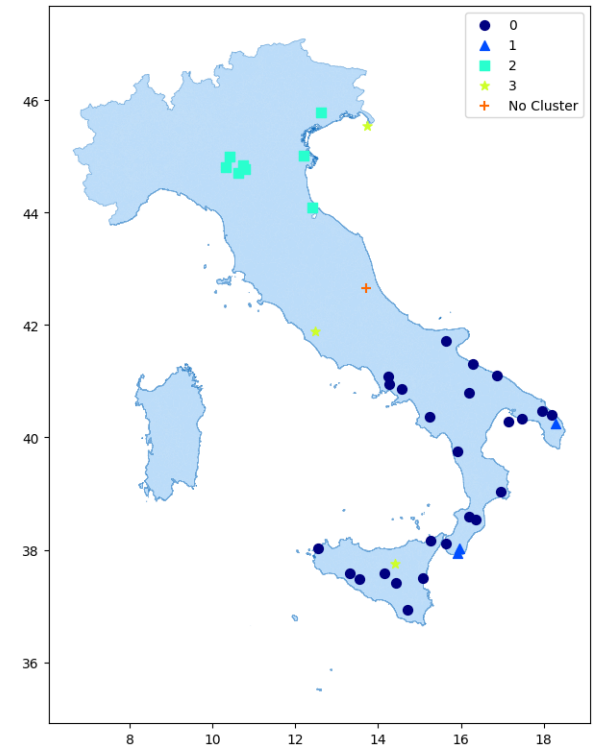
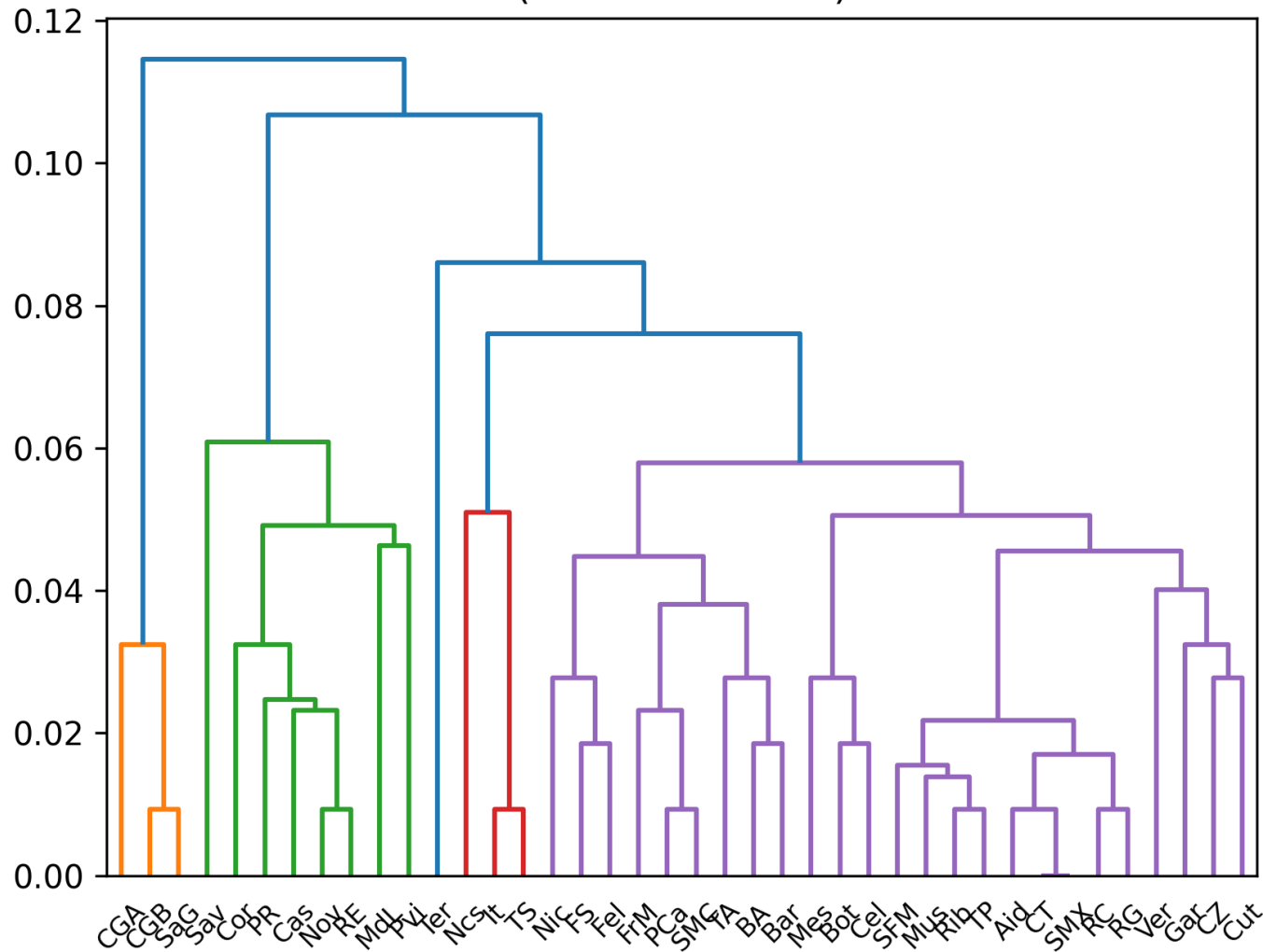
[0.42 in Europe]





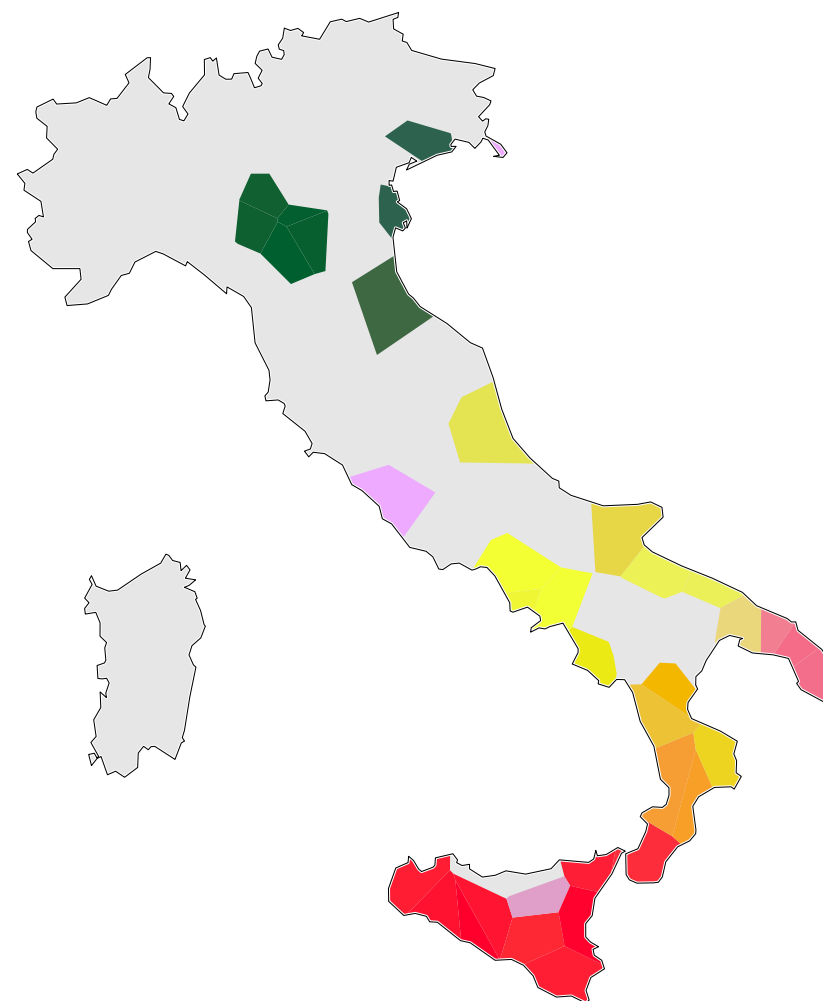
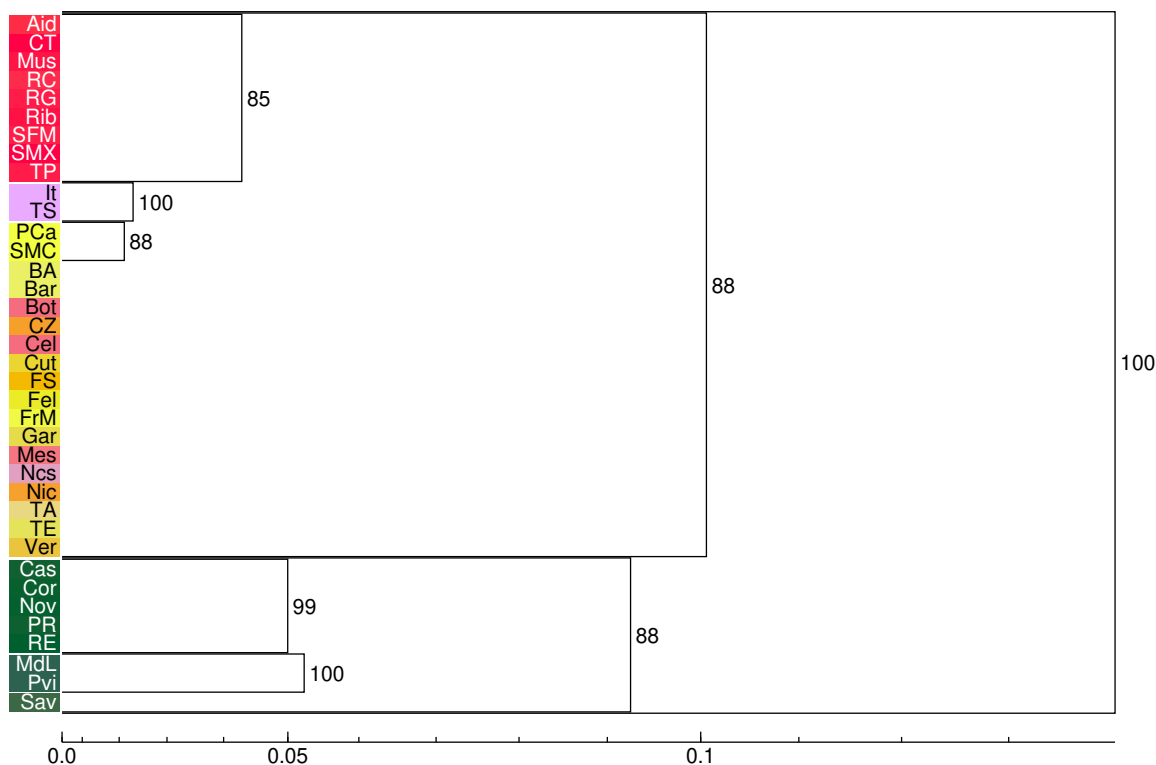
Evaluating dialect aggregations

Hierarchical Clustering Dendrogram
(UPGMA method)

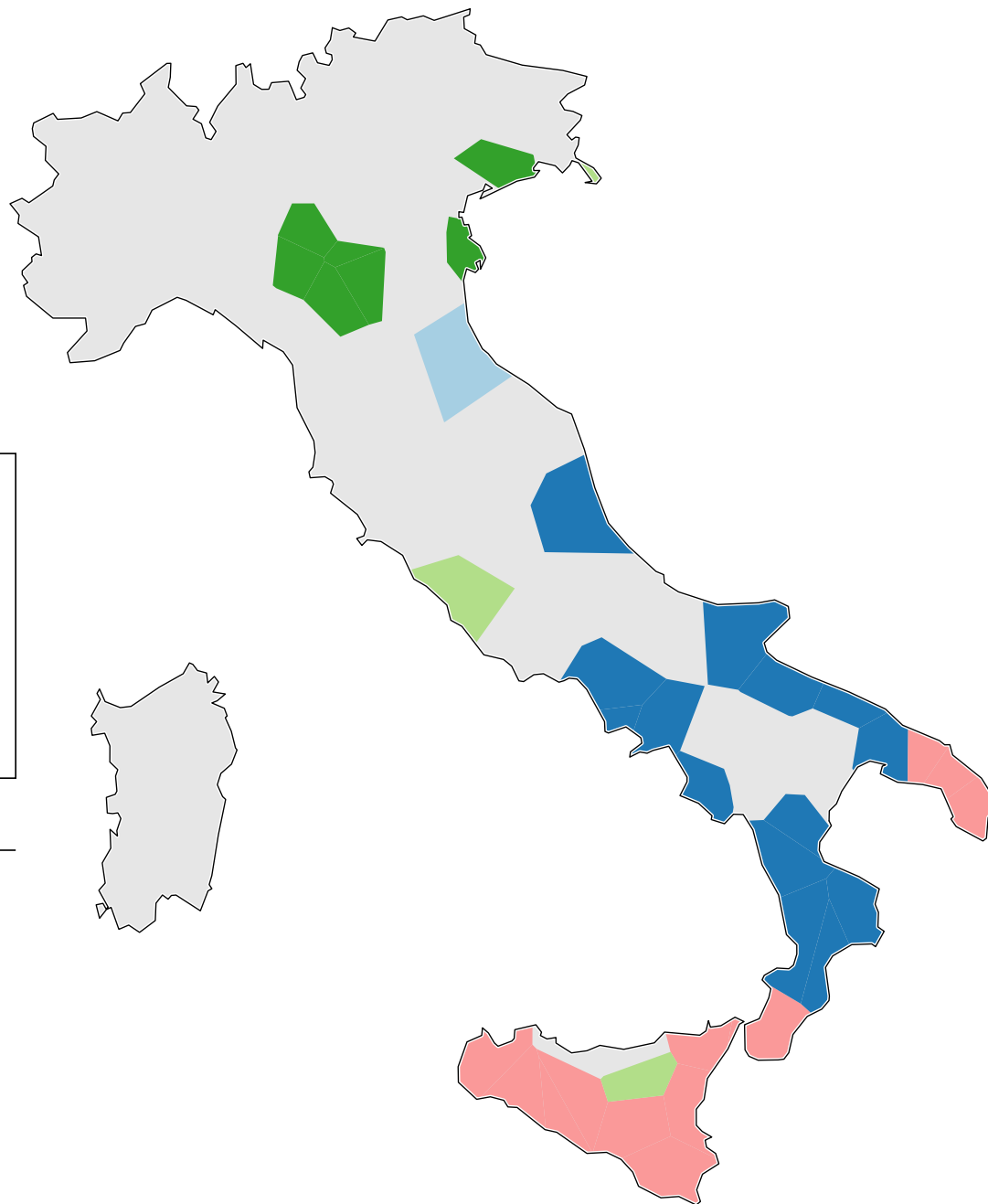
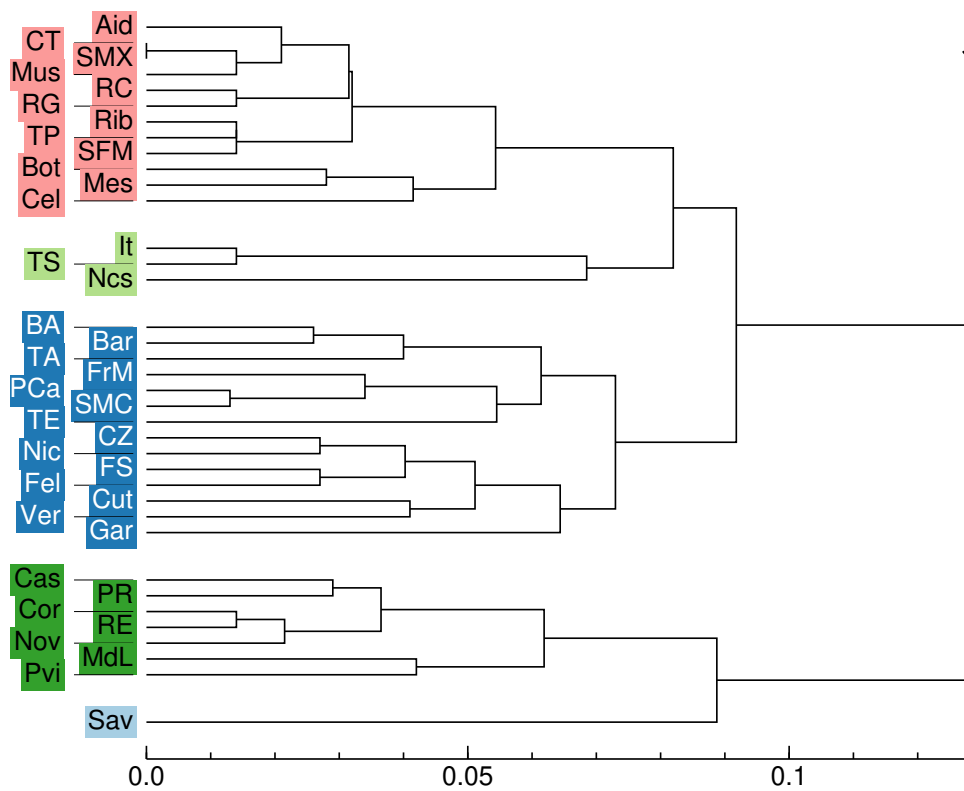


Performed by L.Carletti and F. Motta

Evaluating dialect aggregations



<https://gabmap.let.rug.nl/>

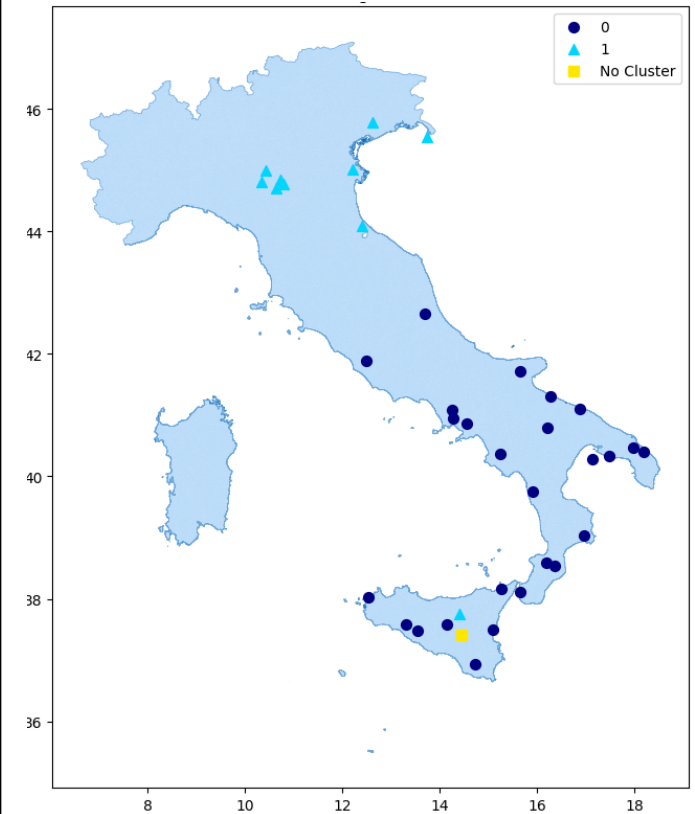
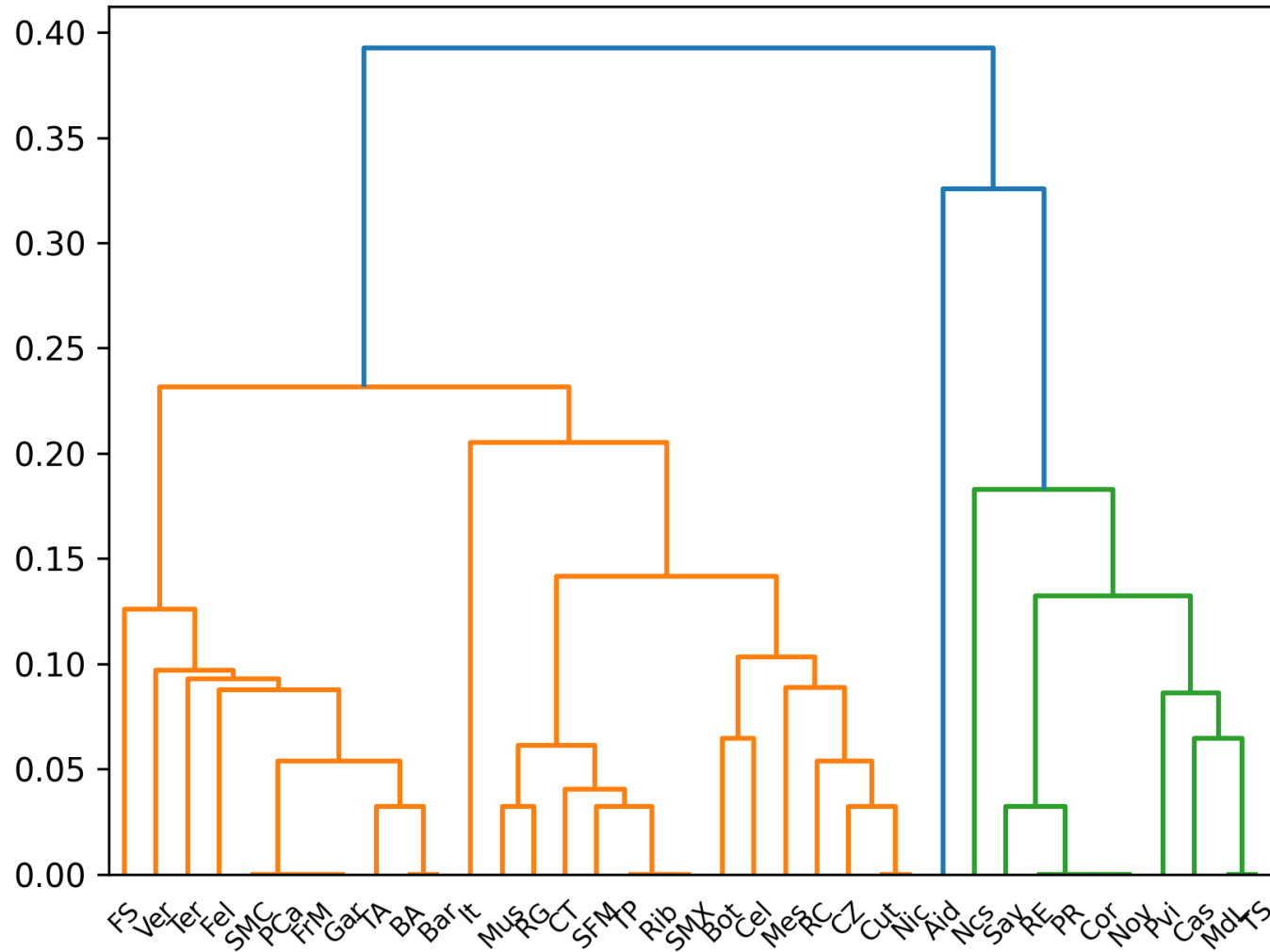


<https://gabmap.let.rug.nl/>

Correlations with other (types of) linguistic variables

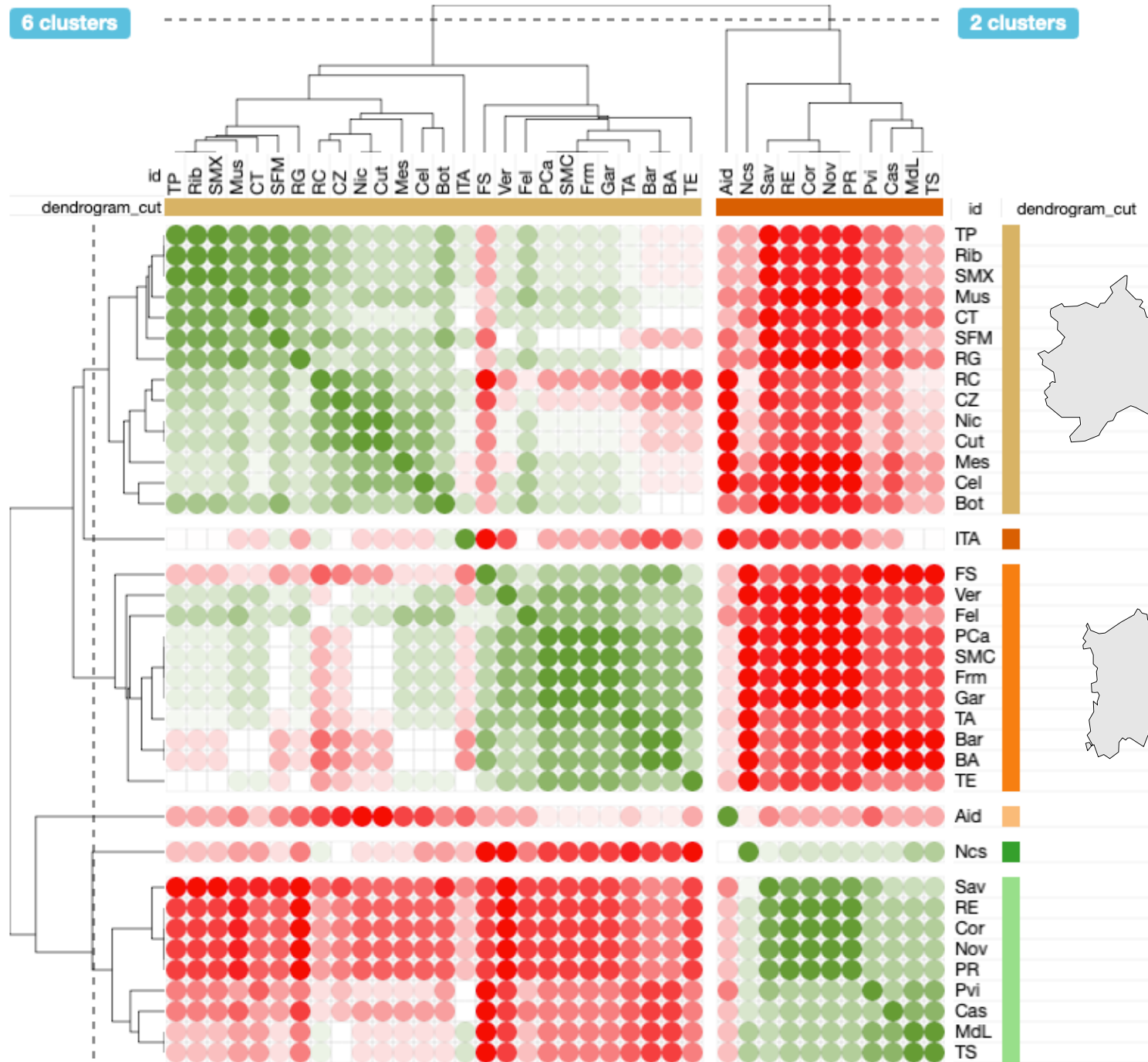
[illegible]

Hierarchical Clustering Dendrogram (UPGMA method)



6 clusters

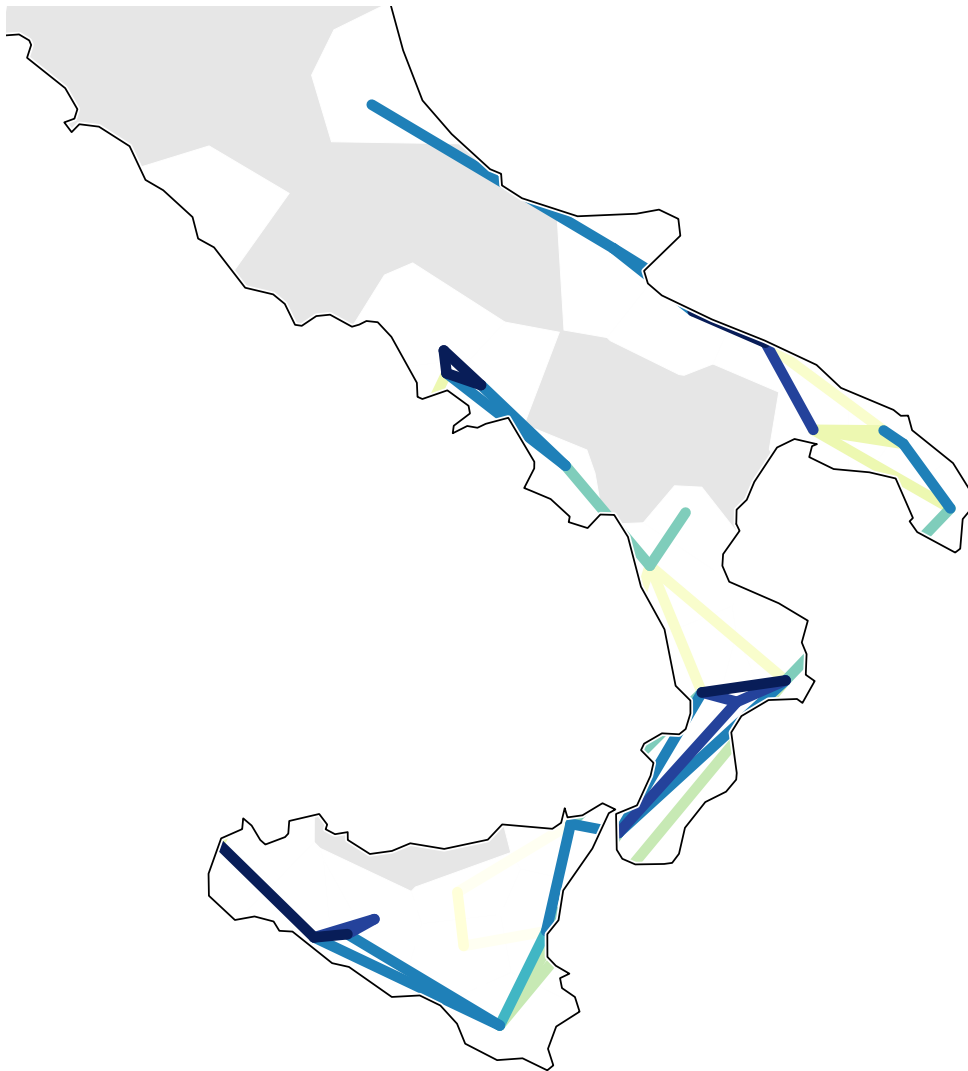
2 clusters



Correlation tests: Mantel (Pearson)

	PCM	Pell77	Geo
PCM		0.6847 (0.001)	0.5854 (0.001)
Pell77	0.6847 (0.001)		0.6074 (0.001)
Geo	0.5854 (0.001)	0.6074 (0.001)	

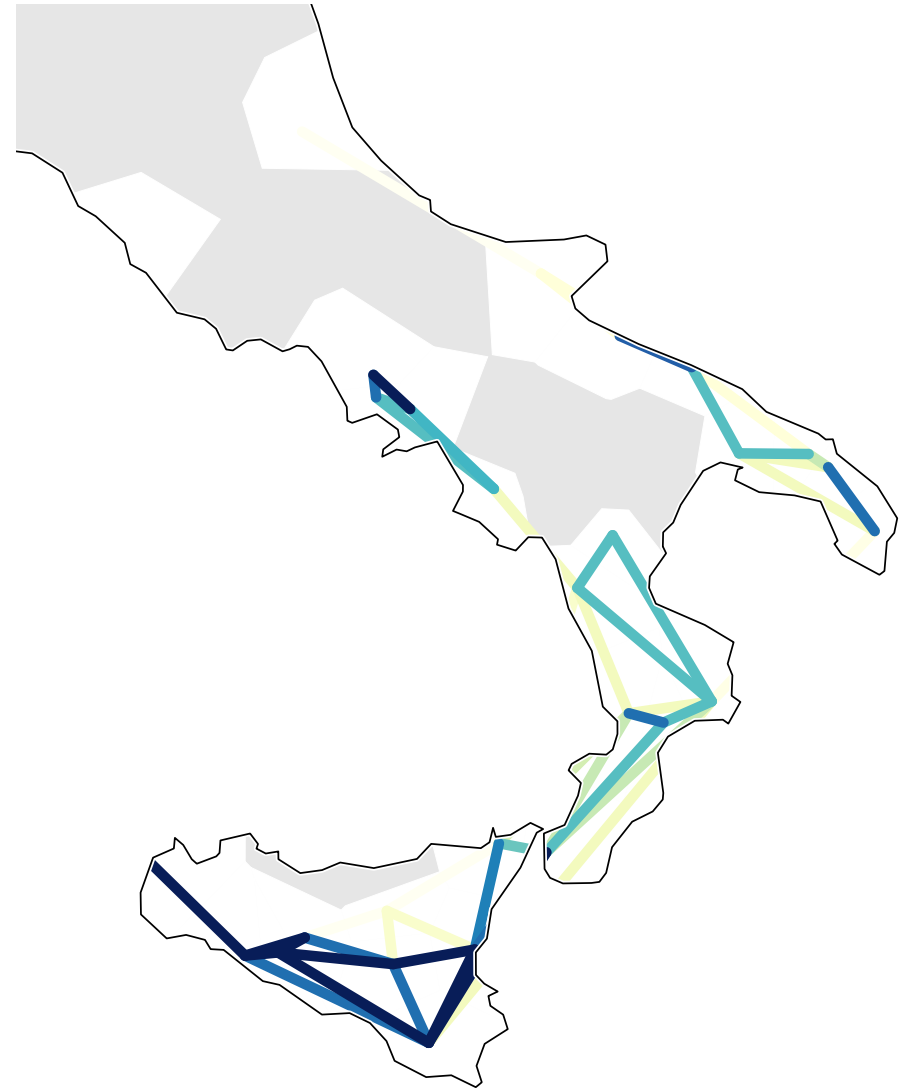
Pellegrini (1977)



Local Incoherence = 0.90

www.parametriccomparison.unimore.it

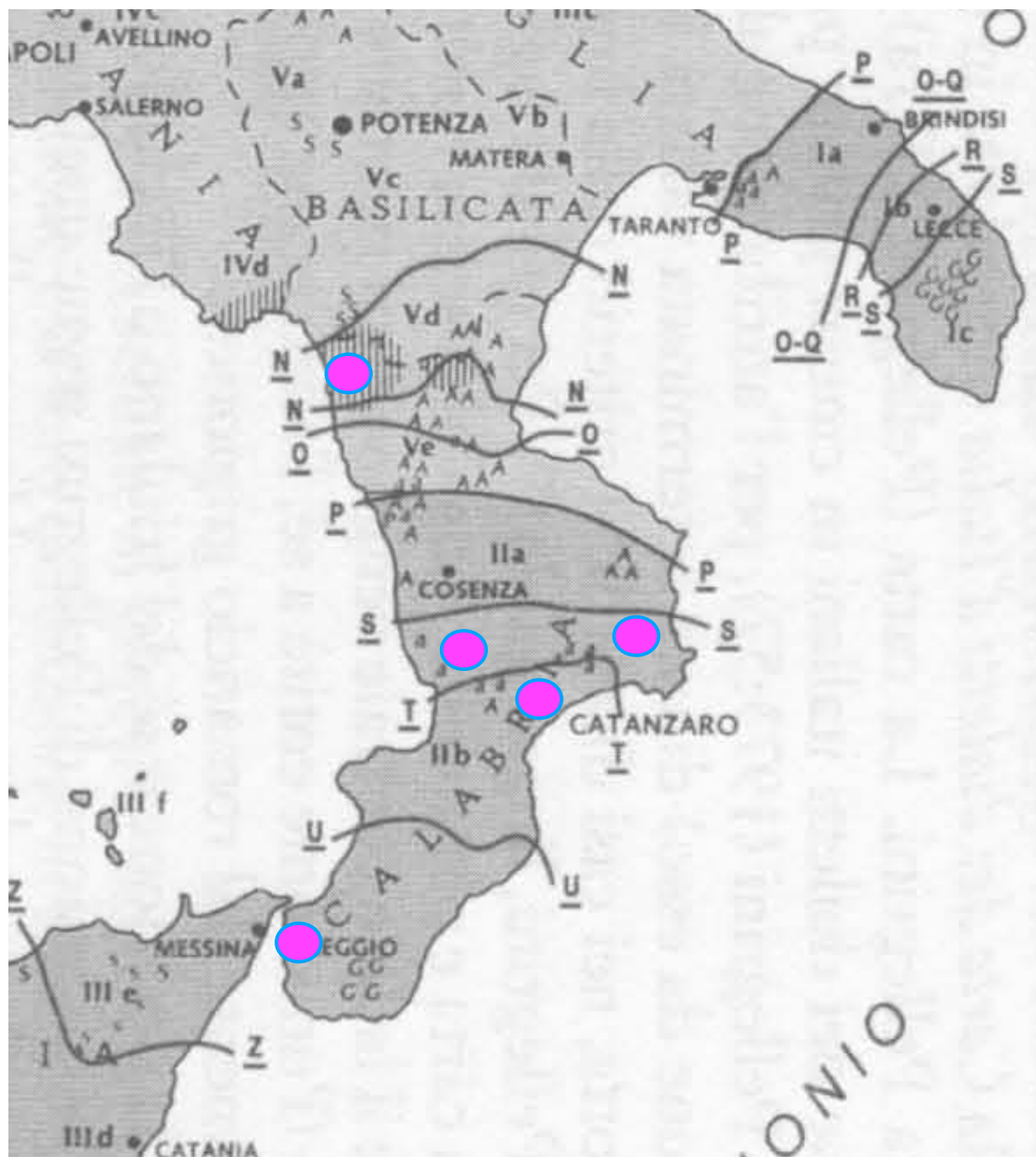
PCM



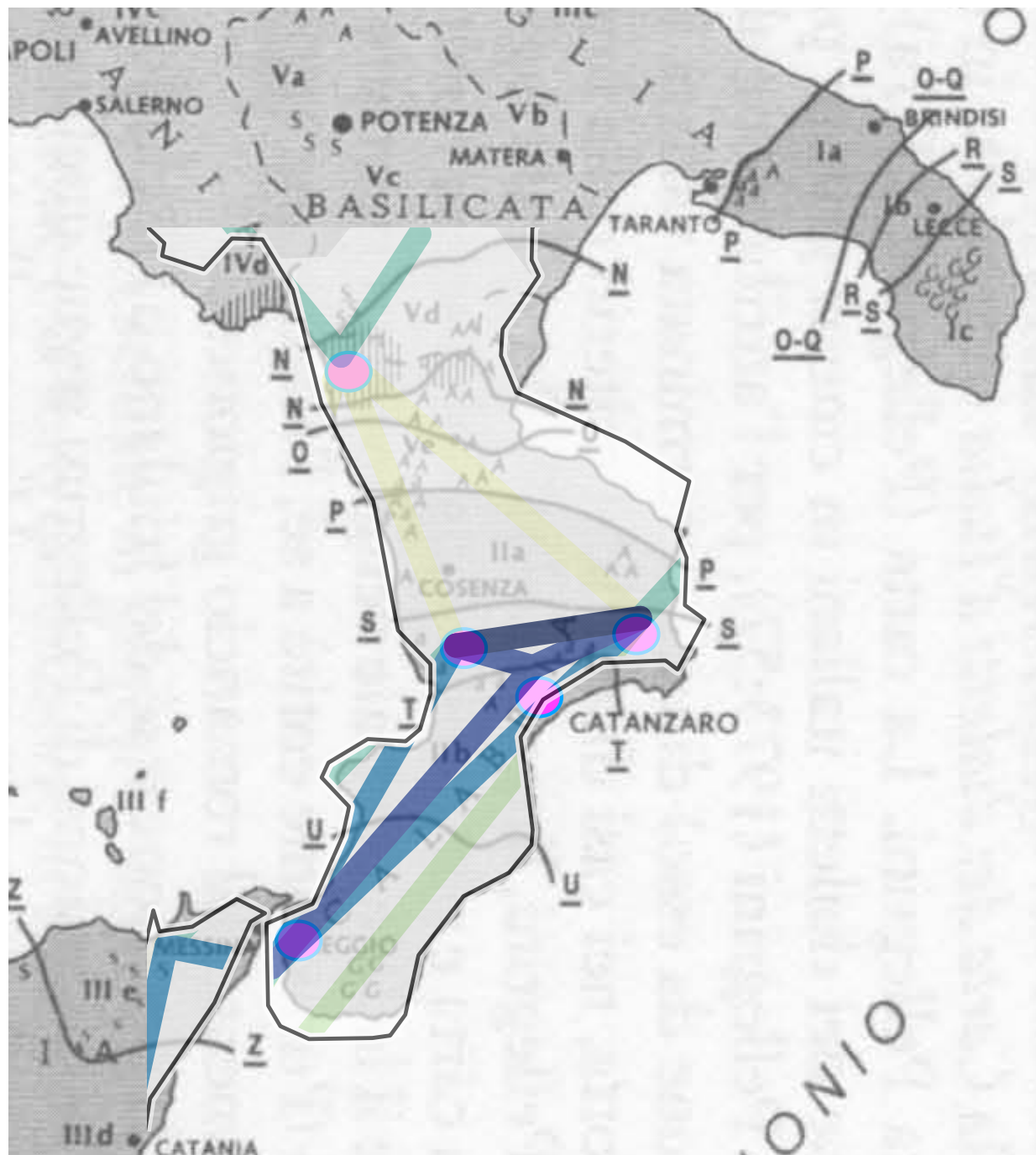
Local Incoherence = 0.89

<https://gabmap.let.rug.nl/>

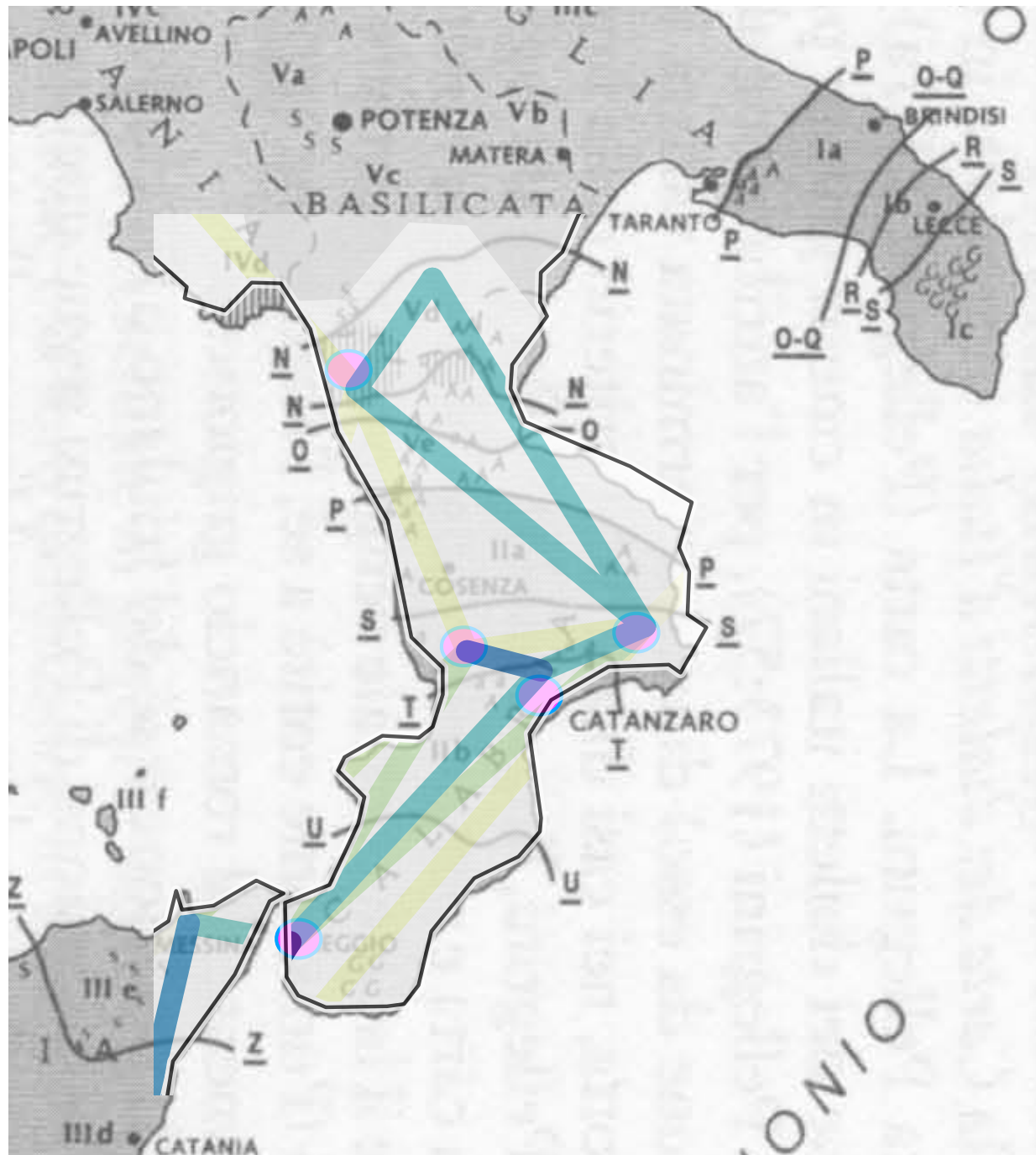




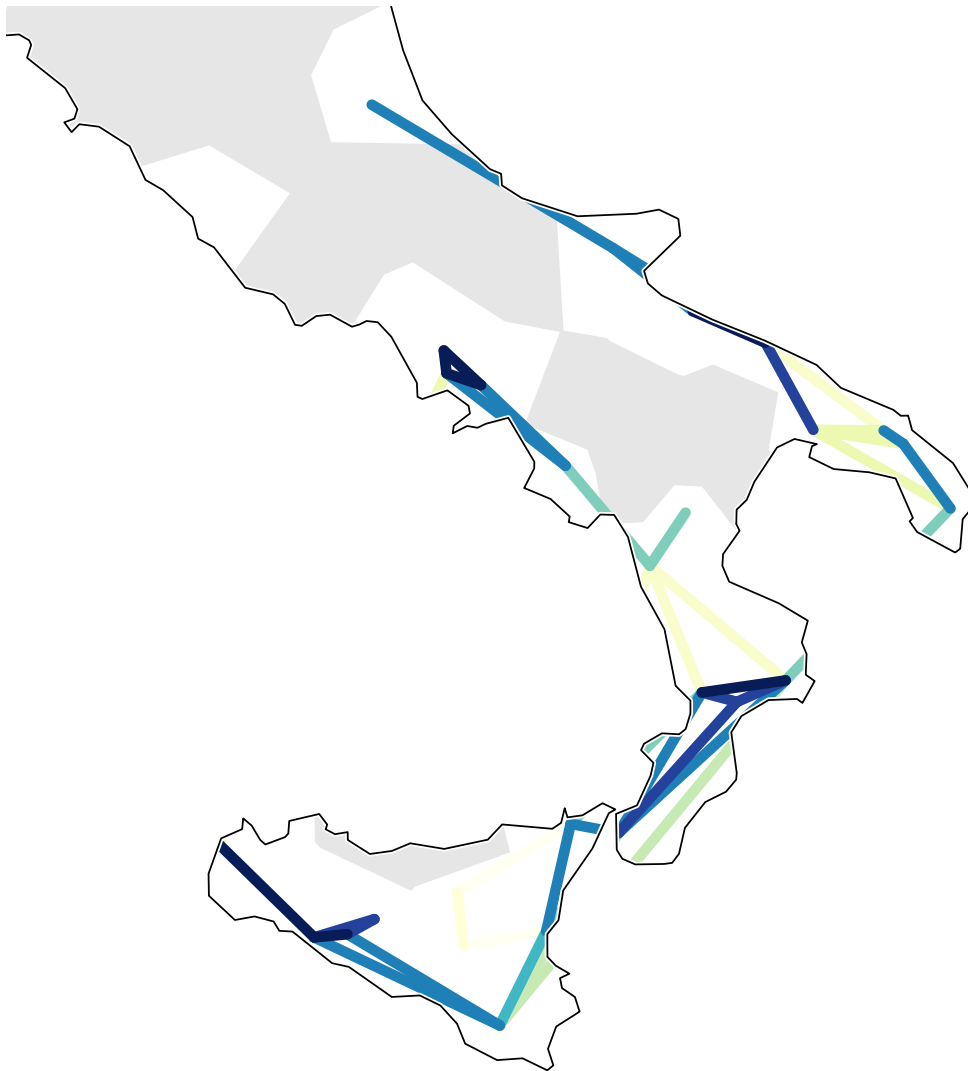
Pellegrini (1977)



PCM



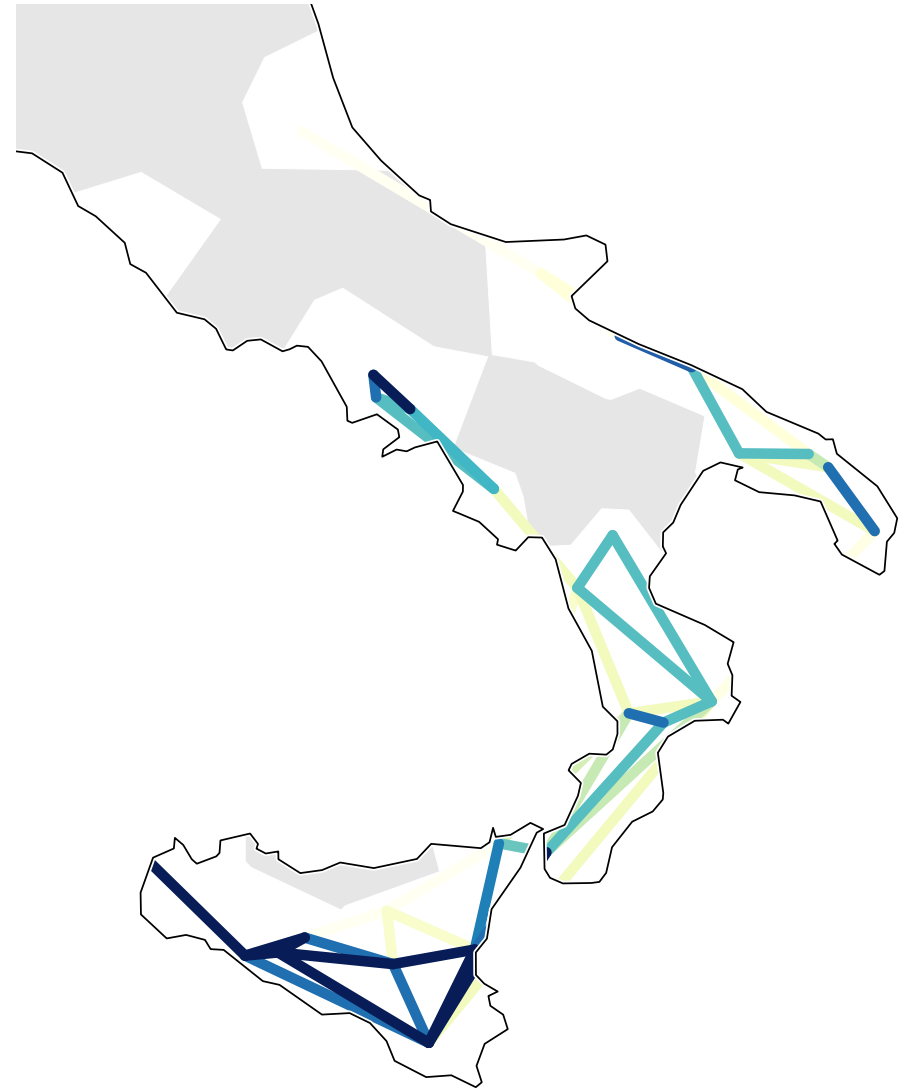
Pellegrini (1977)



Local Incoherence = 0.90

www.parametriccomparison.unimore.it

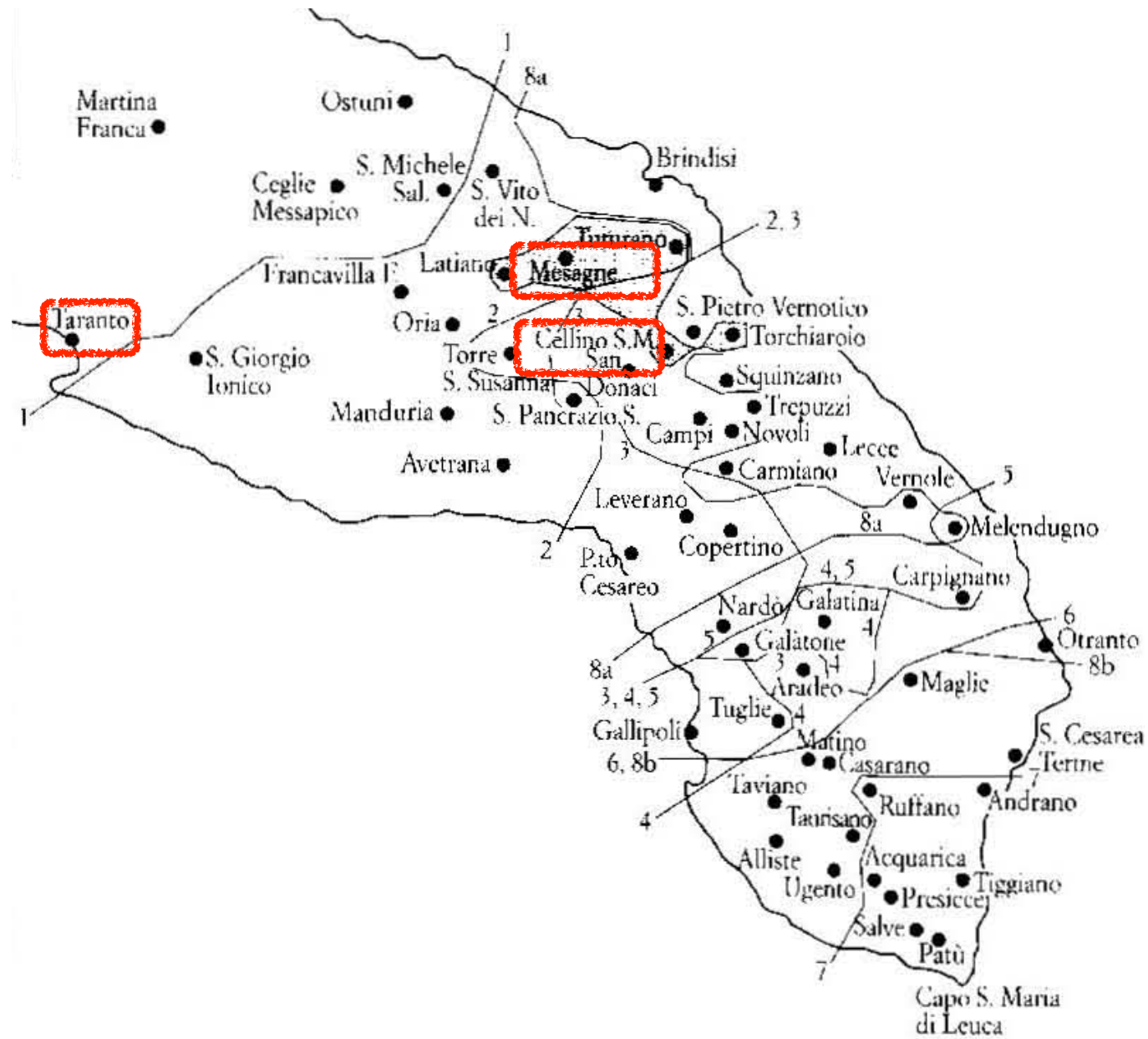
PCM

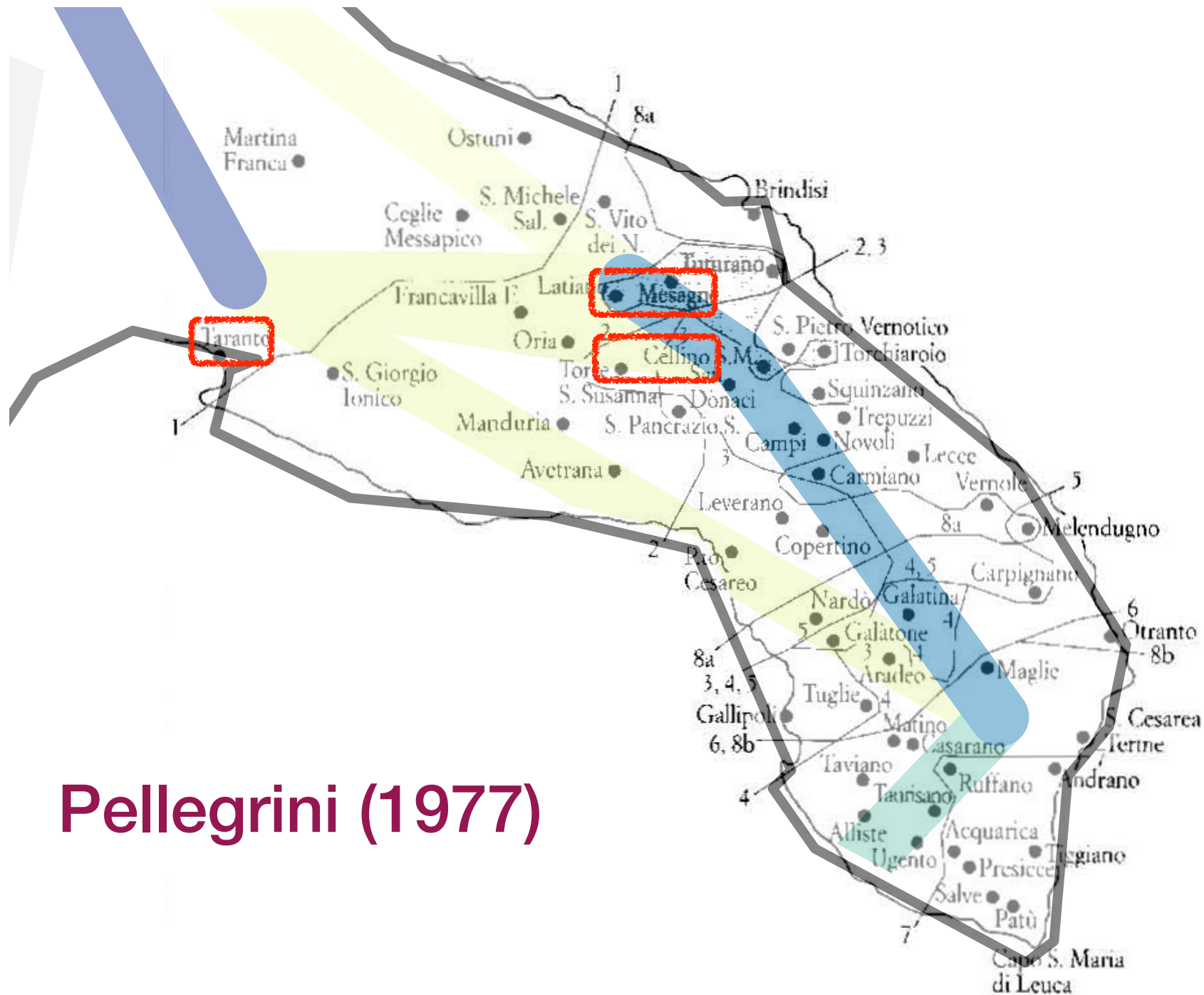


Local Incoherence = 0.89

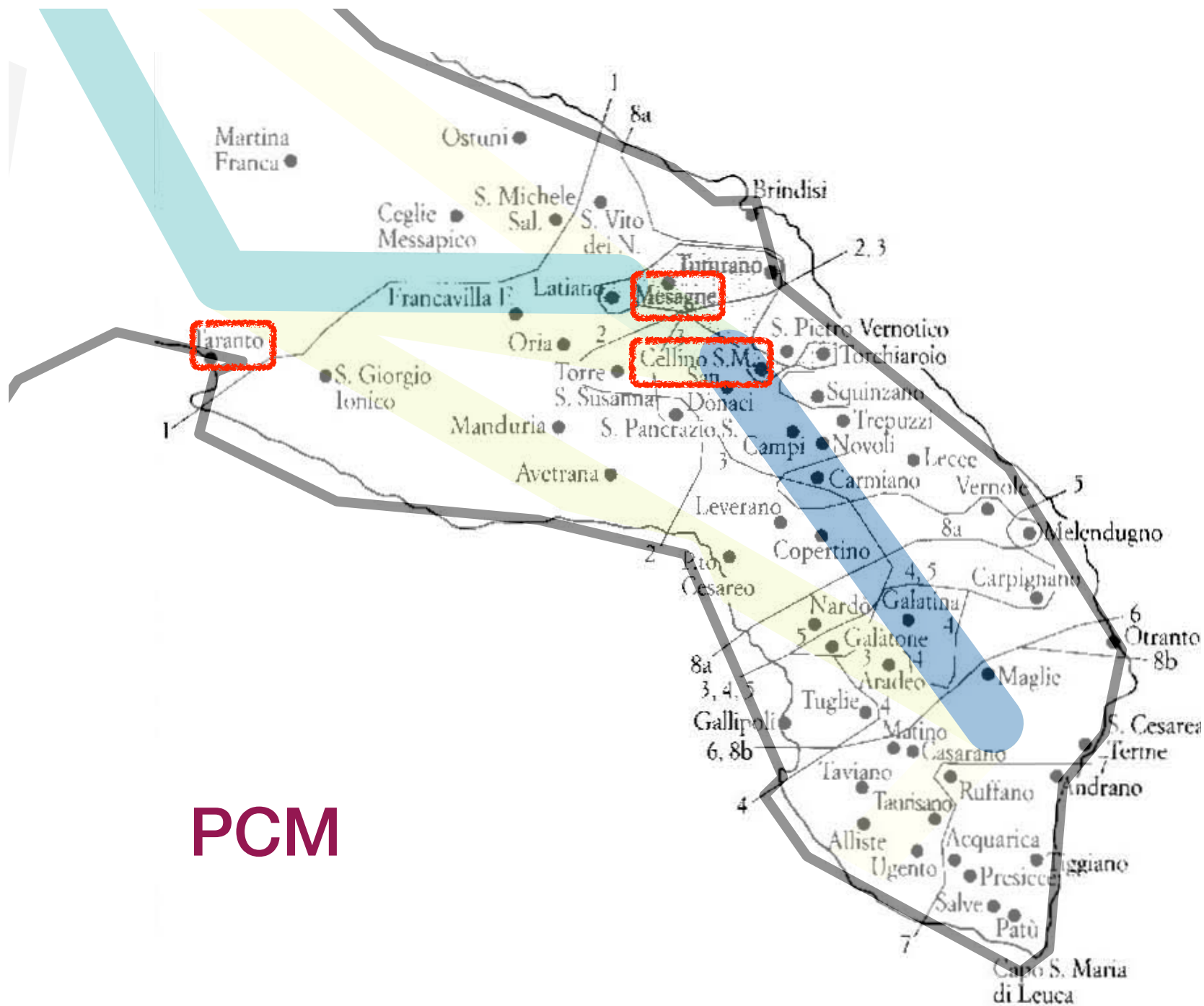
<https://gabmap.let.rug.nl/>







Pellegrini (1977)



*Is it possible to map the **dialectal structure** of
a specific ultralocality domain
through quantitative procedures **using syntax**?*

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a specific ultralocality domain
through quantitative procedures **using syntax**?*

1. Does the PCM capture **any signal** at this level?

- **YES** (Syntactic distances do not flatten)

2. If yes, is it possible to identify **aggregations of dialects** (i.e., syntactic isoglosses)?

- **YES** (at different degrees of stability)

3. To what extent do these aggregations **correlate with other variables** (e.g. dialect classifications, geographic distances, ...)?

- The distribution of parametric distances is **not entirely predictable from geography**
- The dialect aggregations mostly overlap with traditional dialect groups; most of the observed instances of inconsistency (except for Trieste) correspond to independently known areas of dialectal discontinuity

Software

- Morpheus: <https://software.broadinstitute.org/morpheus/>
- Gabmap: <https://gabmap.let.rug.nl/>