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Ragusan Families Marriage Networks

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Abstract

In the paper marriage networks of Ragusan noble families in 16th century, and 18th and 19th century are analyzed using centrality indices and generalized blockmodeling.

1 Introduction

In June 1994 I was a participant of MATH/CHEM/COMP'94 in Dubrovnik, Croatia. In a book-store I came across with a book (Krivošić, 1990) which contains a lot of interesting data about the population of Dubrovnik republic in its history. Among other data there are two matrices describing marriage networks (man × woman) of Ragusan noble families in 16th century (Table 3) and 18th and at beginning of 19h century (Table 4). These data parallel the well known Padgett's marriage network for Florentine families (see Wasserman and Faust, 1994, p. 61-2, 743-4).

Dubrovnik / Ragusa was settled in 7th century, as reported by Constantine Porphyrogenite, by fugitives from Epidaurum after its destruction. Dubrovnik was for a time under a Byzantine protection, but became a free commune as early as 12th century. This free commune quickly grew into a free city-state. They prospered unhindered thanks primarily to their clever diplomacy and great skill in balancing among the great powers, formally recognizing and paying tribute alternately to one then another.

Napoleon, who in 1797 destroyed the Venetian Republic, put an end to the Republic of Dubrovnik in 1806, which subsequently came under Austrian control until the fall of the Austro-Hungarian monarchy in 1918 (Raos, 1969).

2 Data about Ragusan noble families

The Ragusan nobility evolved in 12th–14th centuries and was finally formally formed by statute in 1332.

Tables 1 and 2 represent the dynamics of Ragusan noble families from 14th to 20th century in the years (columns) when their lists (accounts) were made. The

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Table 1: Ragusan noble families (part 1)

	13 36	13 66	13 99	14 23	14 42	15 88	16 67	17 00	18 08	19 26	
Babalio	1	1	1	1	1	1	1	1	-		BOBALI
Balacia	1	1	-								
Baraba	-	1	1	-							
Basilio	-	1	1	1	1	1	1	1	-		BASEGLI
Batalo	-	1	-								
Benessa	-	1	1	1	1	1	-				
Berissina	1	-									
Binzola	1	1	1	1	1	?	-				BINCIOLA
Bissiga	1	-									
Bozignolo	1	1	1	1	1	-a					BUZIGNOLA
Bodaza, Bodacia	-	1	1	1	-						
Bona	1	1	1	1	1	1	1	1	1	1	BONA
Bonda	-	1	1	1	1	1	1	1	-b		BONDA
Bucchia	-	1	1	1	1	1	1	1	-		BUCCHIA
Caboga	1	1	1	1	1	1	1	1	1	-	CABOGA
Callich	1	1	1	1	1	-					
Cassica	1	-									
Catena	1	1	1	1	-						
Ceria	1	-									
Crieva, Zreva	-	1	1	1	1	1	1	1	1	1	CERVA
Cherpa	1	-									
Crossio	1	1	1	1	1	1	-				CROCEO
Dersa	1	1	-								
Gallo	-	1	1	-							
Galozo	1	1	-								
Gambe	1	-									
Ganguli	1	-									
Georgio	1	1	1	1	1	1	1	1	1	-	GIORGI
Getaldi	-	1	1	1	1	1	1	1	1	1	GHETALDI
Gleia, Gleya	1	1	1	1	-						
Gondola	1	1	1	1	1	1	1	1	-		GONDOLA
Goliebo, Galebo	-	1	1	1	-						
Goze	1	1	1	1	1	1	1	1	1	-	GOZZE
Gradi, Grade	1	1	1	1	1	1	1	1	1	-	GRADI
Luca	-	1	1	1	1	-					
Lucari	1	1	1	1	1	1	1	?	-		LUCARI
Macedauro	-	1	-								
Martinussio	1	1	1	1	1	-a					MARTINUS
Mathessa	-	1	1	-							

Table 2: Ragusan noble families (part 2)

	13 36	13 66	13 99	14 23	14 42	15 88	16 67	17 00	18 08	19 26	
Menze	1	1	1	1	1	1	1	1	1	-	MENZE
Mlascagna	1	1	1	1	1	-					
Pabora	1	-									
Palmota	-	1	1	1	1	1	-				PALMOTA
Pecorario	1	1	-								
Petragna	-	1	-								
Poza	1	1	1	1	1	1	1	1	1	-	POZZA
Presliza	-	1	-								
Proculo	1	1	1	1	1	1	1	1	-		PROCULO
Prodanello	-	1	1	1	1	1	1	1	-d		PRODANELI
Ragnina	1	1	1	1	1	1	1	1	1	-	RAGNINA
Resti	-	1	1	1	1	1	1	1	1	-	RESTI
Ribiza	-	1	-								
Saraca	1	1	1	1	1	1	1	1	1	1	SARACA
Saruba	1	-									
Scochilza	1	-									
Slavze, Slavi	-	1	-								
Sorgo	1	1	1	1	1	1	1	1	1	1	SORGO
Stillo	1	1	-								
Sumagna	1	-									
Trepagna	1	-									
Tudisio	-	1	1	1	1	1	1	1	-		TUDISI
Vitagna	1	-									
Volcasso	1	1	-								
Volzo	1	1	1	1	1	-					
Zamagna	-	1	1	1	1	1	1	1	1	-	GIAMAGNO
Zavernico	-	1	-								
Bosdari						-	1	1			
Classich, Clasci						-	1	1	-		
Natali Luccari						-	1	1			
Slatarich						-	1	1			
Giorgi-Bernardo						-	1b	-			
Paoli, Pauli						-	1b	1	-		
Primi						-	1b	?	-		
Serratura						-	1b	-			
Vodopich						-	1c	-			
Sorgo-Bobali							-	1	-		

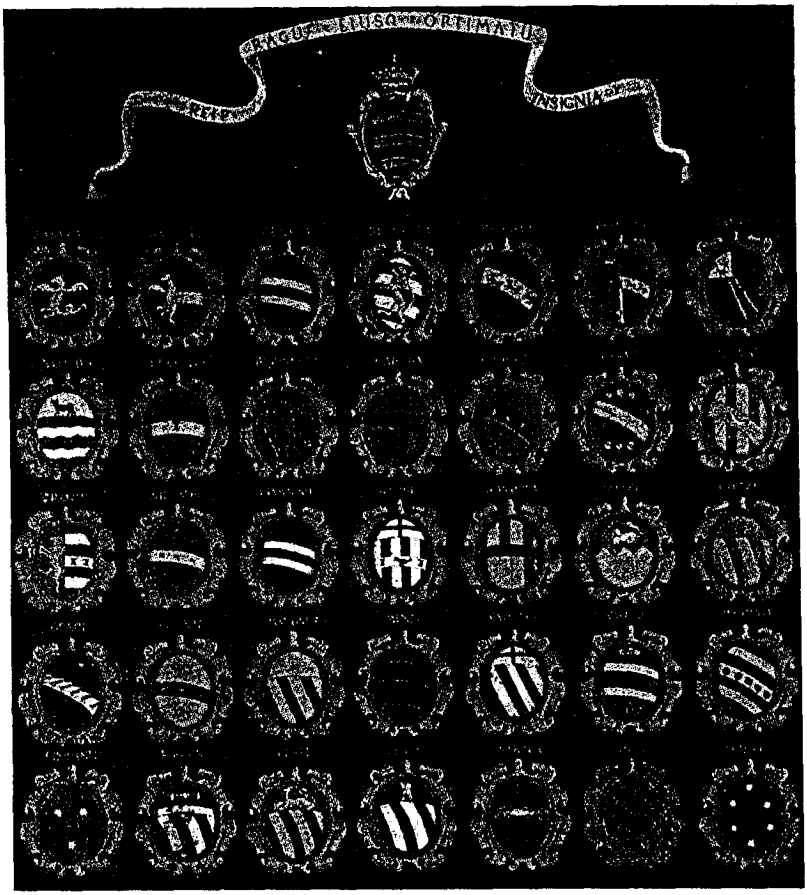


Figure 1: Coats of arms of Ragusan noble families before 1667:

Basegli,	Basegli,	Benesa,	Binciola,	Bobali,	Bobali,	Bona,
Bonda,	Bucchia,	Buzignola,	Caboga,	Caboga,	Cerva,	Cerva,
Croceo,	Ghetaldi,	Giamagno,	Giorgi,	Gondola,	Gozze,	Gozze,
Gradi,	Lucari,	Martinus,	Menze,	Palmota,	Pozza,	Proculo,
Prodaneli,	Ragnina,	Resti,	Resti,	Saraca,	Sorgo,	Tudisi

Table 3: Ragusan noble families marriage network, 16th century

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Babalio	1	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.
Basilio	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Benessa	3	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	1
Bocignolo	4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Bona	5	.	.	2	.	4	.	.	.	1	.	4	1	2	3	1	.	.	.	.	.	.	.	.	1
Bucchia	6	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Caboga	7	.	.	.	.	.	1	1	.	.	.	1	.	.	1	.	.	.	.	.	.	.	.	.	.
Crieva	8	.	.	.	.	1	.	.	1	.	1	1	1	.	.	.	.	.	.	.	1	.	.	.	1
Georgio	9	.	.	.	.	1	.	1	.	1	.	.	.	.	.	.	.	.	.	.	.	1	1	.	.
Gondola	10	.	.	.	.	.	.	.	.	.	2	1	.	.	.	.	.	.	.	.	.	.	1	.	.
Goze	11	.	.	1	1	4	.	1	1	.	1	1	.	.	.	.	.	.	.	1	1	.	.	.	.
Gradi	12	.	.	.	.	.	.	.	.	.	1	1	.	.	.	.	.	.	.	.	.	.	5	.	.
Lucari	13	.	.	.	.	.	.	.	1	.	.	1	1	.	.	.	.	.	.	.	.	.	1	.	.
Menze	14	.	1	.	.	1	.	1	.	.	1	.	.	.	.	.	.	.	.	.	.	.	4	.	.
Palmota	15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Poza	16	.	.	.	.	2	.	.	.	1	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.
Proculo	17	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.
Prodanelo	18	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Ragnina	19	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.
Resti	20	.	.	.	.	1	1	.	1	1	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.
Saraca	21	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Sorgo	22	.	.	1	1	.	.	.	.	.	.	1	2	1	1	.	.	.	.	.	1	.	6	.	.
Tudisio	23	.	.	.	.	.	.	.	.	.	.	.	1	.	1	.	.	.	.	.	.	.	.	.	.
Zamagna	24	.	.	.	.	3	.	.	.	1	2	1	.	.	.	.	.	.	.	.	.	.	1	.	.

Table 4: Ragusan noble families marriage network, 18th and 19th century

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Basilio	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.
Bona	2	.	.	.	.	.	1	.	.	.	2	.	2	.	.	.	.	.	.	.	1	.	.
Bonda	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.
Bosdari	4	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Bucchia	5	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.
Caboga	6	.	.	.	.	.	1	.	.	.	.	.	1	1	.	.	.	.	1	.	1	.	.
Cerva	7	.	1	.	.	1	.	.	.	.	.	.	1	.	.	.	.	.	.	.	1	.	.
Georgi	8	.	1	2	.	.	1	.	.	.	.	.	.	.	.	4	.	.	.	.	.	.	1
Ghetaldi	9	.	1	.	.	.	.	1	.	1	.	.	.	1	.	.	.	.	1	.	.	.	.
Gondola	10	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Goze	11	1	2	1	.	.	.	.	.	.	2	2	.	.	.	.	.	.	.	.	2	1	.
Gradi	12	.	.	.	.	.	.	.	.	.	1	.	.	.	.	1	.	.	.	.	3	.	.
Menze	13	.	.	.	.	.	1	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	1
Natali	14	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Pauli	15	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Poza	16	.	.	2	.	.	.	.	.	.	1	.	.	.	.	1	.	.	.	.	1	.	.
Ragnina	17	.	1	1	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	1	.	.
Resti	18	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	1
Saraca	19	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Slatarich	20	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Sorgo	21	.	2	1	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	1	1	.	1
Tudisi	22	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.
Zamagna	23	.	1	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	1	.	.

meanings of notes in these two tables are: a – missing in 1604; b – accepted in 1670; c – accepted in 1678; d – missing in 1735. One of the problems with Ragusan families are different writings of their names (see tables). The last column contains the names from the Figure 1 which displays coats of arms of Ragusan noble families before 1667.

From the year 1332 no new family was accepted until the big earthquake in 1667.

In Dubrovnik all political power was in the hands of male nobles older than 18 years. They were members of the Great Council (*Consilium majus*) which had the legislative function. Every year 11 members of the Small Council (*Consilium minus*) were elected. It had together with a duke, which was elected for a period of one month, the executive and representative function. The main power was in the hands of the Senat (*Consilium rogatorum*) which had 45 members elected for one year.

This organization prevented that a single family, like Medici in Florence, would prevail. Nevertheless the historians agree that the Sorgo family was all the time among the most influential. For example:

- in 17th century 50 % of dukes and senators were from families: Bona, Gondola, Goze, Menze, Sorgo;
- in 18th century 56 % of senators were from families: Sorgo, Goze, Zamagna, Caboga, Georgi;
- in the last 8 years of Republic 50 % of dukes were from families: Sorgo, Goze, Gradis, Bona, Ragnina.

A big problem of Ragusan noble families was also that by decrease of their number and lack of noble families in the neighbourhood (the surroundings of Dubrovnik was under Turks) they were becoming more and more closely related (1566 – *"quasi tutti siamo congionti in terzo et in quarto grado di consanguinita et affinita"*) – the marriages between relatives of the 3rd and 4th degree were frequent.

3 Analyses

For analyzing both marriage networks we first computed standard sets of indices (influence, support, centrality, betweenness, closeness, Bonacich; see Batagelj, 1993a). Afterward we also applied the generalized blockmodeling Batagelj (1993b) and Dor-

Table 5: Characterizations of types of blocks

null	nul	all 0 (except may be diagonal)
complete	com	all 1 (except may be diagonal)
row-dominant	rdo	$\exists$ all 1 row (except may be diagonal)
col-dominant	cdo	$\exists$ all 1 column (except may be diagonal)
regular	reg	1-covered rows and 1-covered columns

eian, Batagelj and Ferligoj (1994) on them. We were searching for models with

types of blocks given in Table 5 with dominant blocks containing at least two units. All computations were done by programs from program package STRAN (Batagelj, 1991) which are available at address `http://vlado.mat.uni-lj.si/pub/networks/`.

3.1 16th century marriage network

Indices indicate that the most influential families in this century were: Bona, Goze, Sorgo and also Gradi and Menze.

Blockmodeling produced the following series of single optimal solutions $\mathcal{C}_n^{16}$ for $n = 2, 3, 4$ and 5, where $P(\mathcal{C}_n^{16})$ denotes the error of the model.

$P(\mathcal{C}_2^{16}) = 13$
$\{\{1,2,4,6,15,17,18,21,23\},\{3,5,7,8,9,10,11,12,13,14,16,19,20,22,24\}\}$
$P(\mathcal{C}_3^{16}) = 10$
$\{\{1,2,4,6,15,18,21\},\{17,23\},\{3,5,7,8,9,10,11,12,13,14,16,19,20,22,24\}\}$
$P(\mathcal{C}_4^{16}) = 8$
$\{\{1,2,4,6,15,18,21\},\{17,23\},\{3,5,7,8,9,10,12,13,14,16,19,20,24\},\{11,22\}\}$
$P(\mathcal{C}_5^{16}) = 6$
$\{\{1,18\},\{2,4,6,15,21\},\{17,23\},\{3,5,7,8,9,10,12,13,14,16,19,20,24\},\{11,22\}\}$

Note that these clusterings are nested. For $n = 6$ we get $P(\mathcal{C}_6^{16}) = 6$ and several different optimal solutions.

The basic two clusters are:

1	Babalio	2	Basilio	4	Bocignolo	6	Bucchia	15	Palmota
17	Proculo	18	Prodanelo	21	Saraca	23	Tudisio		
3	Benessa	5	Bona	7	Caboga	8	Crieva	9	Georgio
10	Gondola	11	Goze	12	Gradi	13	Lucari	14	Menze
16	Poza	19	Ragnina	20	Resti	22	Sorgo	24	Zamagna

with the corresponding model matrix and error matrix:

	1	2
1	-	-
2	-	reg

	1	2
1	·	6
2	7	·

Most marriages are among the families of the second cluster, there is no marriage among families of the first cluster, and there are only few marriages between the two clusters.

The optimal solution for $n = 5$ is represented in the reordered network matrix in Table 6. The corresponding model matrix and error matrix are:

	1	2	3	4	5
1	-	-	-	-	reg
2	-	-	-	-	-
3	-	-	-	cdo	-
4	-	-	-	reg	rdo
5	-	cdo	-	cdo	rd

	1	2	3	4	5
1	·	·	·	1	·
2	·	·	·	·	·
3	·	·	·	·	·
4	·	5	·	·	·
5	·	·	·	·	·

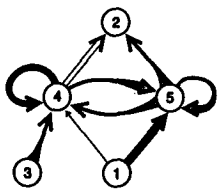


Table 6: Ragusan noble families marriage network, 16th century
Matrix reordered according to C_5^{16}

		1	18	2	4	6	15	21	17	23	3	5	7	8	9	10	12	13	14	16	19	20	24	11	22
Babalio	1	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	2
Prodanelo	18	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.
Basilio	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Bocignolo	4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Bucchia	6	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Palmota	15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Saraca	21	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Proculo	17	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.
Tudisio	23	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	1	.	.	.	.	.	.
Benessa	3	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	1	.	.	1	.	.
Bona	5	.	.	.	.	1	.	.	.	.	2	4	.	.	1	.	1	2	3	.	.	.	1	4	.
Caboga	7	.	.	.	.	1	.	.	.	.	.	.	1	.	.	.	.	.	1	.	.	.	.	1	.
Crieva	8	.	.	.	.	.	.	.	.	.	.	1	.	1	.	1	1	.	.	.	.	1	1	1	.
Georgio	9	.	.	.	.	.	1	.	.	.	.	1	1	.	1	.	.	.	.	.	.	.	.	.	1
Gondola	10	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	2	1
Gradi	12	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	1	5
Lucari	13	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	1	.	.	.	.	.	.	1	1
Menze	14	.	1	.	.	.	.	.	.	.	.	1	1	.	.	.	.	.	.	.	.	.	.	1	4
Poza	16	.	.	.	.	.	.	.	.	.	.	2	.	.	1	.	.	.	.	1	.	.	.	.	.
Ragnina	19	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	1	.	.	.	.
Resti	20	.	.	.	.	1	.	.	.	.	.	1	.	1	1	.	.	.	.	.	.	1	.	.	.
Zamagna	24	.	.	.	.	.	.	.	.	.	.	3	.	.	1	2	.	.	.	.	.	.	.	1	1
Goze	11	.	.	.	1	.	.	.	.	.	1	4	1	1	.	1	.	.	.	.	1	1	.	1	.
Sorgo	22	.	.	.	1	.	.	.	.	.	1	.	.	.	.	.	2	1	1	.	.	1	.	1	6

If we would allow also row-regular and col-regular blocks

row-regular	rre	1-covered rows
col-regular	cre	1-covered columns

the clustering

$\{\{1,18\},\{2,4,6,15,21\},\{17,23\},\{3,5,7,8,9,10,11,12,13,14,16,19,20,22,24\}\}$

gives a perfect model - $P = 0$.

3.2 18th and 19th century marriage network

Indices indicate that the most influential families in this period were: Sorgo, Bona, and also Zamagna, Cerva and Menze.

Blockmodeling produced the following series of single optimal solutions $\mathcal{C}_n^{18}$ for $n = 2,3,4$ and 5.

$P(\mathcal{C}_2^{18}) = 13$
$\{\{1,2,3,6,7,8,9,10,11,12,13,16,19,21,22,23\},\{4,5,14,15,17,18,20\}\}$
$P(\mathcal{C}_3^{18}) = 6$
$\{\{1,2,3,6,7,8,9,10,11,12,13,16,19,21,22,23\},\{4,15,17\},\{5,14,18,20\}\}$
$P(\mathcal{C}_4^{18}) = 4$
$\{\{1,2,3,6,7,8,9,10,11,12,13,16,19,21,22,23\},\{4,18\},\{5,14,20\},\{15,17\}\}$
$P(\mathcal{C}_5^{18}) = 3$
$\{\{1,2,3,6,7,8,9,10,11,12,13,16,21,22,23\},\{4,18\},\{5,20\},\{14,19\},\{15,17\}\}$

Note that these clusterings are almost nested. For $n = 6$ we get $P(\mathcal{C}_6^{18}) = 3$ and several different optimal solutions.

The basic two clusters are:

1	Basilio	2	Bona	3	Bonda	6	Caboga	7	Cerva
8	Georgi	9	Ghetaldi	10	Gondola	11	Goze	12	Gradi
13	Menze	16	Poza	19	Saraca	21	Sorgo	22	Tudisi
23	Zamagna								

4	Bosdari	5	Bucchia	14	Natali	15	Pauli	17	Ragnina
18	Resti	20	Slatarich						

with the corresponding model matrix and error matrix:

	1	2
1	reg	-
2	-	-

	1	2
1	·	3
2	10	·

Most marriages are among the families of the first cluster, there is no marriage among families of the second cluster, and there are only few marriages between the two clusters.

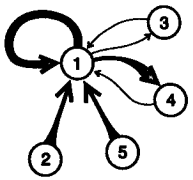
The optimal solution for $n = 5$ is represented in the reordered network matrix in Table 7. The corresponding model matrix and error matrix are:

Table 7: Ragusan noble families marriage network, 18th and 19th century
Matrix reordered according to $\mathcal{C}_5^{18}$

	1	2	3	6	7	8	9	10	11	12	13	16	21	22	23	4	18	5	20	14	19	15	17
Basilio	1	·	·	·	·	·	·	·	·	·	·	·	1	·	·	·	·	·	·	·	·	·	·
Bona	2	·	·	·	1	·	·	·	2	·	2	·	1	·	·	·	·	·	·	·	·	·	·
Bonda	3	·	·	·	·	·	·	·	·	·	·	·	2	·	·	·	·	·	·	·	·	·	·
Caboga	6	·	·	·	·	1	·	·	·	·	1	·	1	·	·	·	·	·	·	1	1	·	·
Cerva	7	·	1	·	1	·	·	·	·	·	1	·	1	·	·	·	·	·	·	·	·	·	·
Georgi	8	·	1	2	·	1	·	·	·	·	·	4	·	·	1	·	·	·	·	·	·	·	·
Ghetaldi	9	·	1	·	·	·	1	·	1	·	·	·	·	·	·	·	·	·	·	1	1	·	·
Gondola	10	·	1	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·
Goze	11	1	2	1	·	·	·	·	2	2	·	·	2	1	·	·	·	·	·	·	·	·	·
Gradi	12	·	·	·	·	·	·	·	1	·	·	1	3	·	·	·	·	·	·	·	·	·	·
Menze	13	·	·	·	1	·	·	1	·	·	·	·	·	·	1	·	·	·	·	·	·	·	·
Poza	16	·	·	2	·	·	·	·	1	·	·	1	1	·	·	·	·	·	·	·	·	·	·
Sorgo	21	·	2	1	·	·	·	·	1	·	·	·	1	·	1	·	·	·	1	·	·	·	·
Tudisi	22	·	·	·	·	·	·	·	·	·	·	·	1	·	·	·	·	·	·	·	·	·	·
Zamagna	23	·	1	·	·	·	·	2	·	·	·	·	1	·	·	·	·	·	·	·	·	·	·
Bosdari	4	·	1	·	·	·	·	·	·	·	·	·	·	·	1	·	·	·	·	·	·	·	·
Resti	18	·	·	·	·	·	·	·	·	1	·	·	·	·	1	·	·	·	·	·	·	·	·
Bucchia	5	·	·	·	·	·	·	·	·	·	1	·	·	·	·	·	·	·	·	·	·	·	·
Slatarich	20	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·
Natali	14	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·
Saraca	19	·	·	·	·	·	·	1	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·
Pauli	15	·	1	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·
Ragnina	17	·	1	1	·	·	·	·	1	·	·	·	1	·	·	·	·	·	·	·	·	·	·

	1	2	3	4	5
1	reg	-	-	rdo	-
2	cdo	-	-	-	-
3	-	-	-	-	-
4	-	-	-	-	-
5	cdo	-	-	-	-

	1	2	3	4	5
1	·	·	1	·	·
2	·	·	·	·	·
3	1	·	·	·	·
4	1	·	·	·	·
5	·	·	·	·	·



4 Conclusion

Comparing clusterings for both networks we can see that the main cluster contains almost the same families – a kernel: Bona, Caboga, Cerva, Gondola, Goze, Gradi, Menze, Poza, Sorgo and Zamagna. The families from the first cluster of $\mathcal{C}_2^{16}$, except Saraca, ceased to exist till 1808. The new families, accepted after the earthquake, belong to the second cluster of $\mathcal{C}_2^{18}$. For detailed interpretation additional data about Ragusan nobility should be collected.

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