

Short Report

ISOLATION AND MARRIAGE PATTERNS IN FOUR SOUTH TYROLEAN VILLAGES (ITALY) DURING THE NINETEENTH CENTURY

A. RIEGLER*, F. MARRONI*, C. PATTARO*, P. GUERESI† AND
P. P. PRAMSTALLER*‡§

**Institute of Genetic Medicine, EURAC Research, Bolzano, Italy, †Department of Statistical Sciences P. Fortunati, University of Bologna, Italy, ‡Department of Neurology, University of Lübeck, Germany and §Department of Neurology, General Regional Hospital, Bolzano, Italy*

Summary. No information is currently available on the marriage patterns of German-speaking communities of the South Tyrol area. The aim of this study is to investigate the reproductive isolation of four South Tyrolean mountain villages during the 19th century. Data about 3953 marriages were drawn from existing pedigrees and completed with data from the parish registers of the studied villages to calculate the following indicators: age at marriage, endogamy, inbreeding from dispensations and from isonymy and repeated pairs of surnames among couples. The results show high levels of endogamy (78–87%) and an elevated age at marriage in all the studied villages. The percentages of consanguineous marriages (10–33%) vary considerably but result overall in relatively low inbreeding values (α 0.0015–0.0036; F_i 0.0098–0.0138). Levels of endogamy are consistent with the geographic characteristics of the area, while inbreeding values are lower than those observed in previous studies on Alpine communities. This is due to a low frequency of marriages between close relatives, probably related to the peculiar demographic and cultural characteristics of the studied populations that differentiate them from neighbouring Italian-speaking villages.

The present study aims to analyse marriage behaviour in four Alpine villages of South Tyrol from 1781 to 1920. South Tyrol is the northern-most province of Italy, with approximately 69% German speakers, and was part of the Austrian Empire until 1918, when it was annexed by Italy. The studied villages are located along the Venosta Valley in the western part of the region, neighbouring with Austria, Switzerland and the Italian-speaking regions of Lombardy and Trentino. Curon (1520 m) and Stelvio (1310 m) lie close to traffic routes, while Martello (1312 m)

and Senales (1300 m) are dead-end valleys. The inhabitants of the studied villages were Catholic and German-speaking. The economy was based on agriculture and cattle breeding. Severe poverty, accentuated by the agricultural crisis after the Napoleonic wars, led to both seasonal and permanent emigration. The most important difference in cultural and economic features was the traditional inheritance system: while in Senales an estate could not be divided, in Stelvio and Curon it was split between all heirs; in Martello both systems were adopted. According to Austrian census figures, over the 19th century population size diminished slightly in Martello and Senales and considerably in Curon, while Stelvio experienced a small increase after 1870 due to the growing importance of tourism. Three of the examined villages (Curon, Martello and Stelvio) are part of a large on-going genomic research programme (GenNova) for the identification of genetic susceptibility to diseases (Pattaro *et al.*, 2007). To the authors' knowledge there has not been any study to date that focuses on the marriage behaviour of the German-speaking populations of South Tyrol.

Data on a total of 3953 marriages were collected from church records. The period studied was 1781–1920, subdivided into four 35-year periods. For the villages of Curon, Martello and Stelvio pedigrees reaching back to the 17th century had previously been reconstructed for the purpose of genetic analysis. They were used to compute the mean age at marriage. Endogamy rate was measured according to the spouse's place of birth. Exogamous marriages were typically celebrated in the groom's parish, where the couple would then usually reside; this could be verified with pedigree data. Consanguinity was evaluated through the percentage of consanguineous marriages and the inbreeding coefficient (Bernstein's α) (Cavalli-Sforza & Bodmer, 1971) from ecclesiastical dispensations. The coefficient of inbreeding from isonymy (F_I) (Crow, 1980) and the repeated pairs coefficient (RP) for measuring the subdivision of the population (Lasker & Kaplan, 1985) were also computed.

Due to the extreme geographic conditions, total values for birth endogamy in the four villages (Table 1) are similar or even higher than those observed in other sub-valleys of the adjacent Trento province, which are comparable in population size: e.g. 80% in Vermiglio Valley in the period 1725–1923 (Martuzzi Veronesi *et al.*, 1996), 73% in the Rumo Valley in the period 1825–1923 (Gueresi *et al.*, 2001) and 87% in the Rabbi Valley in the period 1780–1915 (Gueresi *et al.*, 2002). Endogamy decreases steadily in Curon, while in the other villages a decline is observed in the last 35-year period. In all villages, exogamous partners came mostly from the main Venosta Valley, but marriage with neighbouring German-speaking North Tyrolean and Swiss partners was not infrequent, with 31.6% of exogamous marriages in Curon and 19.5% in Stelvio. Despite the commercial relationships, the exchange of spouses with the Italian surroundings was insignificant, counting for only six of 3953 marriages. This shows that the linguistic barrier was very hard to overcome.

In Table 1 mean age at marriage is shown regardless of civil status of the spouses, allowing a comparison with the data of Senales, which were taken from the literature (Keim, 1975). In the three villages where it was possible to compute mean age at first marriage, it was 0.2–0.7 years lower for women and 0.8–1.9 lower for men. During the first half of the 19th century mean age at marriage was lower for both sexes in Stelvio, where possessions were split between heirs, and highest in Senales, where the

Table 1. Biodemographic indicators in four South Tyrolean villages 1781–1920

	Curon		Martello		Senales		Stelvio	
Total no. marriages	1226		729		985		1013	
Endogamous %	78.1		87.5		80.1		83.4	
Age at marriage (male/female)	35.3	29.7	34.5	30.5	36.1*	33.3*	31.2	28.4
Consanguineous %	10.7		32.9		25.6		24.9	
α	0.0015		0.0036		0.0027		0.0027	
F_t	0.0115		0.0109		0.0138		0.0099	
F_r	0.0086		0.0117		0.0134		0.0076	
F_n	0.0029		-0.0008		0.0005		0.0022	
RP	0.00169		0.00245		0.00326		0.0011	
RP _r	0.00121		0.00227		0.00282		0.00094	
(RP-RP _r)/RP _r	0.4		0.08		0.16		0.17	

The results are averages of 35-year periods, except for age at marriage, which are the average of 50-year period.

*Source: Keim (1975).

inheritance was not split, while in the following 50 years it increased in all villages, particularly in Curon (5.7 years for males and 2.9 for females vs 2.5–2.9 and 1.2–1.5 in the other villages). Age at marriage in South Tyrol appears to be very high, especially in comparison with several Italian-speaking areas of the Trentino region. Marriage prior to inheritance was extremely disadvantageous due to economic constraints, and was made more difficult by the general worsening of the economic condition and the introduction of a legal restriction in 1820 that required couples to provide proof of economical stability to the civil authorities (Mantl, 1997).

Overall values for the inbreeding coefficient α are quite low compared with the percentage of consanguineous marriages (Table 1). This is confirmed by a comparison with two sub-valleys of the Trentino region analysed in approximately the same period: Vermiglio, 1775–1923, $\alpha=0.0041$, 22% of consanguineous unions (Martuzzi Veronesi *et al.*, 1996); Rabbi, 1780–1915, $\alpha=0.0041$, 24% of consanguineous unions (Gueresi *et al.*, 2002). During the investigated period, 40–55.7% of dispensations were issued for the fourth degree of relationship against 0.5–1.7% for the second degree. Multiple consanguinity (13.6–27.5 % of total dispensations) consisted primarily of a combination of distant degrees and gave the major contribution to α in Martello and in Senales. As for endogamy values, consanguineous unions and α were highest in the smallest and more isolated village of Martello and lowest in the most populated parish of Curon. The development of inbreeding shows clear tendencies only in the two main villages: an increase of α in Stelvio where first-cousin unions appeared in the last subperiod, and a diminishment in Curon where these unions disappeared after the first subperiod.

An explanation for the uncommonness of first-cousin marriages may be found in the prohibitive cost of the dispensations that these unions required (Rabino-Massa *et al.*, 2005), whose price in 1845 was equivalent to the price of a 2-year-old bull. By

contrast, dispensations between distant relatives were affordable for a larger part of the population. Moreover, the attitude of local clerics, decisive for obtaining the dispensation, was to discourage marriage between close relatives (Bittles & Smith, 1994). Another reason could be the awareness of the negative effects of inbreeding, acquired from experience in cattle breeding. These factors, although not peculiar to the studied area, may have impacted more on South Tyrolean marriage behaviour than in neighbouring Trentino, because their influence can vary according to local cultural and economic background. However, demographic factors must be taken into account. The correlation between inbreeding and population trend or family size has been pointed out in previous studies (Pettener, 1985; Fuster & Colantonio, 2004). The development of inbreeding, which depends on the frequency of close relative unions, seems to be related to changes in population size: rising in Stelvio and steeply decreasing in Curon. Low nuptiality rates, as documented for Austria (Viazzo & Albera, 1986), high age at marriage and high emigration rates presumably limited family size and consequently number of marriageable close relatives. Marriages between first cousins were already observed to be rare in past demographic studies on North Tyrolean mountain communities with a decreasing population trend (Troger, 1954; Lässer, 1956).

Evidence that the low numbers of dispensations for second degree relative marriages were not due to incomplete registration is found in the low percentage of isonymous marriages (3.9–5.6) and values of F_t and F_r (Table 1), which tend to be lower than those observed in other Alpine communities (Pettener *et al.*, 1994; Martuzzi Veronesi *et al.*, 1996; Guerese *et al.*, 2001). Overall, random isonymy (F_r) showed the highest values in the less populated and more isolated villages of Senales and Martello. The non-random isonymy, F_n , is generally low, but more pronounced in the two largest parishes Curon and Stelvio.

Values of RP and RP_r (the random component of the repeated pairs of surnames) (Table 1) were also higher in Senales and Martello, and were very similar to those observed in neighbouring Italian-speaking villages (Martuzzi Veronesi *et al.*, 1996; Guerese *et al.*, 2001). The surplus of RP compared with RP_r is low, except in the largest village, Curon. Thus the typical Germanic form of dispersed settlement favoured the population subdivision only where the settlement's size was large enough to allow endogamy within it. Values of F_t and RP coefficients showed little variation over time.

On the whole, differences in reproductive isolation between villages reflect differences in geographical isolation and economic development. The influence of the inheritance system on marriage behaviour, which seemed to be on age at marriage in the first half of the 19th century, was probably lessened by the subsequent general worsening of economic conditions.

References

- Bittles, A. H. & Smith, M. T. (1994) Religious differentials in postfamine marriage patterns, Northern Ireland, 1840–1915. I. Demographic and isonymy analysis. *Human Biology* **66**, 59–76.

- Cavalli-Sforza, L. L. & Bodmer, W. F.** (1971) *The Genetics of Human Populations*. W. H. Freeman, San Francisco.
- Crow, J. F.** (1980) The estimation of inbreeding from isonymy. *Human Biology* **52**, 1–14.
- Fuster, V. & Colantonio, S. E.** (2004) Socioeconomic, demographic, and geographic variables affecting the diverse degrees of consanguineous marriages in Spain. *Human Biology* **76**, 1–14.
- Gueresi, P., Martuzzi Veronesi, F. & Valentini, D.** (2002) Aspetti del comportamento matrimoniale della Val di Rabbi (TN) dal 1566 al 1960. In Fornasin, A. & Zannini, A. (eds) *Uomini e comunità delle montagne: paradigmi e specificità del popolamento dello spazio montano secoli 16–20*. Forum, Udine, pp. 87–101.
- Gueresi, P., Pettener, D. & Veronesi, F. M.** (2001) Marriage behaviour in the Alpine Non Valley from 1825 to 1923. *Annals of Human Biology* **28**, 157–171.
- Keim, M.** (1975) *Schnals-Kulturgeographie einer Südtiroler Bergbauerngemeinde*. Vol 2. Athesia, Bolzano.
- Lasker, G. W. & Kaplan, B. A.** (1985) Surnames and genetic structure: repetition of the same pairs of names of married couples, a measure of subdivision of the population. *Human Biology* **57**, 431–440.
- Lässer, A.** (1956) *St. Leonhard im Pitztal. Bevölkerungsgeographische Untersuchung unter besonderer Berücksichtigung der Wanderbewegung*. Vol. 149. Wagner, Innsbruck.
- Mantl, E.** (1997) *Heirat als Privileg. Obrigkeitliche Heiratsbeschränkungen in Tirol und Vorarlberg 1820–1920*. Vol. 23. Verlag für Geschichte und Politik, Vienna.
- Martuzzi Veronesi, F., Gueresi, P. & Pettener, D.** (1996) Biodemographic analysis of Italian Alpine communities (Upper Sole valley, 1725–1923). *Rivista di Antropologia* **74**, 55–75.
- Pattaro, C., Marroni, F., Riegler, A. et al.** (2007) The genetic study of three population microisolates in South Tyrol (MICROS): study design and epidemiological perspectives. *BMC Medical Genetics* **8**, 29.
- Pettener, D.** (1985) Consanguineous marriages in the Upper Bologna Apennine (1565–1980): microgeographic variations, pedigree structure and correlation of inbreeding secular trend with changes in population size. *Human Biology* **57**, 267–288.
- Pettener, D., Gueresi, P. & Martuzzi Veronesi, F.** (1994) Struttura biodemografica della valle del Fersina (Valle dei mocheni) dal 1800 al 1914. *Bollettino di Demografia Storica* **20**, 131–140.
- Rabino-Massa, E., Prost, M. & Boetsch, G.** (2005) Social structure and consanguinity in a French mountain population (1550–1849). *Human Biology* **77**, 201–212.
- Troger, E.** (1954) *Bevölkerungsgeographie des Zillertales*. Vol. 123. Wagner, Innsbruck.
- Viazzo, P. P. & Albera, D.** (1986) Population, resources and homeostatic regulation in the Alps: the role of nuptiality. In Mattmüller, M. (ed) *Wirtschaft und Gesellschaft in Berggebieten*. Schwabe and Co., Basel, pp. 182–231.

