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Population

Geographic Similarities Between First and Second Demographic

Transitions in Italy

Demographic changes are dependent upon economic and social/cultural change. Adoption of characteristics of demographic change does not happen all at once or all over a country, but starts with areas of early adoption and spreads to other regions. Although particular characteristics of geographic regions have been used to explain the differences in adoption of change (Coale and Cotts Watkins 1979, Livi-Bacci 1977), little is known about the stability of geographic differences over time (Leshtage and Neels 2006.) Will an area of early adoption of one type of demographic change continue to be an early adopter of other types of change decades or centuries later? The purpose of this study is to examine areas of early adoption of first demographic transition characteristics such as reduced marital fertility and changes in proportions married and to compare them with areas of early adoption of second demographic transition characteristics such as increased cohabitation and extra marital births to discover geographic patterns of similarity. The country chosen for this study is Italy.

Italy makes an ideal case study for this question for two reasons. First, there are clear, documented geographic differences in adoption of first demographic transition characteristics by region. Second, Italy has been slow to adopt second demographic transition characteristics but recent increases of cohabitation and extra marital births (ISTAT) allow us to examine emergent patterns of these characteristics and compare them to earlier patterns of first demographic characteristics by region.

1st Demographic Transition: Reasons and Characteristics

Changes in political, social and economic structures were responsible for the demographic changes of the first demographic transition (Kingsley, 1963). This transition is characterized by a decline in mortality rates and increased life expectancy followed by a decline in fertility rates. This transition has occurred to some degree world wide; however these trends began first in industrialized nations (Goode, 1970).

Major changes in mortality rates stem almost exclusively from the reduction in the frequency and severity of major diseases. Reduction of epidemics such as the plague, and later control of diarrhea, smallpox, and tuberculosis causes rapid decline in mortality rates and extended life expectancy. Some of the most influential factors in lowering rates of mortality are nutrition (McKeon, 1972), improved public health (Schofield and Reher, 1991) and sanitation (Hanley, 1987) policies and medical improvements (Caldwell,1986).

During the first demographic transition fertility decline was primarily impacted by dropping mortality rates, industrialization, and urbanization. The decline in mortality initially results in an increase of population and then fertility begins to decline. Fertility rates drop to nearly resemble mortality rates (Teitelbaum,1975). Mortality rates work as a causal factor for fertility decline because it increases the odds of survivability of children and therefore reduces need for subsequent births (Robinson,1997). Because fertility behavior is rational and responds to economic and social situations (Caldwell,1986) fertility is

impacted by mortality levels. Lower levels of mortality reduce the need for children.

Industrialization meant the introduction of new time and labor saving technologies that reduced the number of people and hours needed to do the job. This directly reduced fertility rates because farms did not need as high levels of replacement fertility; but it also indirectly reduced fertility rates because children not needed for farm labor sought out jobs in growing urban areas. This process of urbanization increased the age at marriage for the children sent to work in cities and also reduced the chance of their ever marrying compared to their rural counter parts (Goldin, 1992). Increased numbers of never married and later ages at marriage for those that did marry reduced fertility rates for urban workers. Urbanization also increased access to health and contraception information which also impacted urban workers fertility.

Geographic Differences in Italy's First Demographic Transition

In 1977 Massimo Livi- Bacci released a book on the fertility decline in Italy. Although he found some variations in decline from traditional patterns of 1st demographic change, he found distinct regional differences. Some of the reasons that he used to explain the differences were: Population density and size, access to birth control and education, and migration.

The larger populations and Urban areas of Italy are primarily in the Northern and Central Regions of Italy. Livi- Bacci (1977) found that the fertility declines began earliest in densely populated provinces. Fertility decline also advanced more quickly in those areas.

Education and access to birth control were both more common in larger cities (Livi-Bacci 1977). The central provinces surrounding Rome had the earliest high levels of access to education and birth control. This was followed by the northern regions and the rest of the central region. The southern provinces were the last to have this access.

According to Livi-Bacci migration into other nearby countries was responsible for a diffusion of ideas that influenced lower fertility levels. This migration was initially from the northern provinces. Later migration from the central provinces began but there was limited migration from the southern provinces to other countries, most southern migration was to the central parts of Italy.

2nd Demographic Transition: Reasons and Characteristics

The second demographic transition is characterized by continued low mortality and fertility levels at or below replacement level (Teitelbaum, 1975, Caldwell 1976). It is also characterized by an increase in non-traditional family forms including high levels of divorce, and increased cohabitation, extra marital births, and same sex partnerships (Lesthaeghe and Surkyn, 2002). The social and economic changes that influenced this transition were increased individualization, women's workforce participation.

As the movement from rural farms to city environments continued in later stages of industrialization, traditional forms of family began to change. Extended family or communal family groups were ideal for farms because of the amount of labor. However, a more nuclear family was more rational in an increasingly urban

society (Caldwell 1976) as the family became more nuclear and less extended the need for large number of children for support became less. When children become less of a needed commodity their value does not come from the labor that they provide but from the individual ideas of their value to individual parents. Investing in children becomes a choice or one place to invest money (Becker, 1981). Fertility declines because the cost of the individual choice to have children is competing with other options and the benefit of having children has declined so families choose fewer children (Lesthaeghe and Surkyn, 2004).

The increase in women's labor force participation impacts fertility through several mechanisms. First, delays in marriage and childbirth caused by schooling and careers shorten the time that women are both fertile and having children. Second, increasing hours of work with continued expectations of females to take on the primary care giver role increases the costs and reduces the benefits of children, particularly multiple children. According to Karen Oppenheim Mason (1997) the demand for children is decreased by increasing the opportunity costs or what women have to give up in order to have children. Finally increased autonomy of women and increased access to contraception allow more freedom to choose fewer births (Bongarts 1978).

Diffusion and Demographic Transitions

Structural changes that influence demographic transitions generally are concentrated in small areas and spread out from there. This diffusion is process is explained by Lesthaeghe and Vanderhoeft's (2001)concept of "ready willing

and able". This means that in order for change to occur there must be information on possible alternatives, economic incentives for change, and social acceptance of those changes. Without some degree of all three elements change cannot occur.

According to Lesthage and Vanderhoeft (2001), information on change comes from technological development, education and knowledge brought in from outside areas. An idea is economically viable when the cost of resources needed to implement the changes outweighs the benefit of the change. A social desire for change such as revolution can influence the economic incentives and technological development or the economic incentives and information on innovation can create social desirability. Either way social acceptance is a necessary part of the process of change.

Because urban areas have higher access to wealth and outside ideas than rural areas, they are more likely to change first. Education and technological advancements are also higher in urban areas. Ideas and demographic change spreads from urban centers out into rural areas. There are clear indications that the theory of ready, willing, and able is supported by 1st demographic transitions. Innovations in health, sanitation and medicine made the first immediate differences in mortality in larger populations and urban areas. Fertility declines as stated above were in part caused by moves into urban areas.

The main question addressed in this paper is how are patterns of first demographic transitions related to patterns of second demographic transitions. Although the motivations and causal factors are different for both the first and

second demographic transitions, urbanization and access to information are key to both. Second demographic transitions are taking place in a time of increased urbanization and those urban areas established during the first demographic transition tend to remain highly populated, educated and wealthy. In this way the socio-cultural and economic conditions that spurred 2nd demographic transition are related to those that caused 1st demographic transition.

If there is a link between the 1st and 2nd demographic transitions then there will be a similarity in the geographic patterns in both transitions. It is hypothesized that geographic patterns of adoption of first demographic characteristics will be correlated with patterns of second demographic characteristics.

Methods

Although the first demographic transition had characteristics of both low mortality and low fertility this project focuses on indicators of fertility. The two primary measures of the first demographic transition used in this project are marital fertility and proportions married. Regional and provincial demographic statistics on marital fertility and proportions married were obtained from Massimo Livi-Bacci's 1977: <u>A History of Italian Fertility during the Last Two Centuries</u>. Three years were chosen from the study in order to span the time of Italy's demographic transition. These years were 1871 for early or pre-transition demographics, 1911 for mid-transition, and 1961 for the height of the transition.

Percent extra marital births and percent cohabitation in regions and provinces of Italy were used as indicators of the second demographic transition.

The years used were 2000 and 2003 for extra marital births and 2001 for cohabitation. This represents the most recent available information on these characteristics available from *ISTAT*.

To discover possible geographic relationships between the first and second demographic transition Pearson Correlations were performed for all provinces of Italy. Individual correlations were calculated for: proportions married and extra marital births in 2000, proportions married and extra marital births 2003, proportions married and cohabitation 2001, fertility rate and extra marital births 2000, fertility rate and extra martial births 2003, and fertility rate and cohabitation 2001 for all three years 1871, 1911, and 1961. This was a total of 18 separate correlation calculations. Correlations were also figured for the northern, central and southern regions of Italy.

Results

In 1871 the fertility rate in Italy was .65 (see table 1). Fertility was similar throughout the country with only slightly lower fertility is some northern provinces (see maps). In 1911 the national fertility rate had only dropped slightly to .62 but regional differences were large. A few of the northern provinces had fallen below.3 while some southern provinces had rates over.7. By 1961 rates for all of Italy had fallen to .39. All southern provinces remained over .4. While most northern and central provinces were below .3. The northernmost provinces as well as the provinces surrounding Rome had lower fertility levels first; this spread to other northern and central provinces and was slowly adopted by southern provinces.

Proportions married in 1871 in all of Italy was .56, this fell slightly to .52 in 1911 and increased to .54 by 1961. The largest change in proportion married took place in central provinces that were at .44 in 1871 and .6 by 1961. Southern regions remained stable in proportions married; northern regions dropped slightly in 1911 but had similar rates in 1871 and 1961. Proportion married does not have as strong diffusion patterns as fertility rates, but southern provinces were still slower to adopt.

Extra marital births in 2000 and 2003 also show regional differences (See maps). For all of Italy extra marital births are low (10% in 2000 and 14% in 2003) but there is wide variance by region and province (See Table 1). Northern provinces had the highest rates at 13% and 18% for each respective year. Central Italy had rates of 11% and 15%, while southern Italy had much lower rates at 7% and 9%. This shows the same pattern as fertility rates with northern provinces and provinces surrounding Rome having the highest rates and southern provinces having the lowest rates.

All but one province (Molise -0.13) increased percentage of extra marital births between 2000 and 2003. This increase was highest in the northern region (5%) and only slightly lower in the central region (4%). The increase was lowest in the southern region (2%).

Cohabitation in 2001 was very low overall for Italy, slightly less than 4%. Cohabitation in the northern region is about 5%, the center region has about 4%, and the southern region is at about 2%. The highest rates are in northern

provinces and those provinces around Rome. This is very similar to first demographic transition patterns.

There are regional similarities for both proportion married and marital fertility in 1871, 1911, and 1961 when compared to extra marital births and cohabitation rates. There is a negative correlation between both proportion married and fertility in all three years and cohabitation and extra marital births. This means that provinces with the highest proportions married and fertility rates in 1871, 1911, and 1961 have the lowest extra marital births and cohabitation rates; while provinces with the lowest levels of proportions married and fertility rates had the highest extra marital births and cohabitation rates. However, these similarities are only statistically significant for 1911 proportion married and 1961 marital fertility (see table 2). The proportion married is significant at the .05 level or better for both years of extra marital births and at the .001 level for cohabitation. The marital fertility rate is significant at .05 or better for both years of extra marital births and 2001 cohabitation rates.

Conclusion

First demographic transition characteristics began in northern and some central regions of Italy (see maps). Changes in fertility and proportion married were adopted fastest in the northern regions of Italy. Central Italy followed and southern Italy adopted changes slowly.

Second demographic characteristics show similar patterns, with early adoption in northern and central regions. There is a significant correlation

between regional adoption of first demographic transition fertility rates and proportion married, and second demographic transition cohabitation and extra marital births.

    This is consistent with the hypothesis and with the Theory of Ready, Willing, and Able. Areas that established themselves as centers of 1st demographic change due to access to information and wealth are likely to remain centers of education, technological advance and have increased access to knowledge coming from outside. This allows these areas to be more receptive to change and more likely to change first compared to areas that have remained predominantly rural throughout both demographic transitions.

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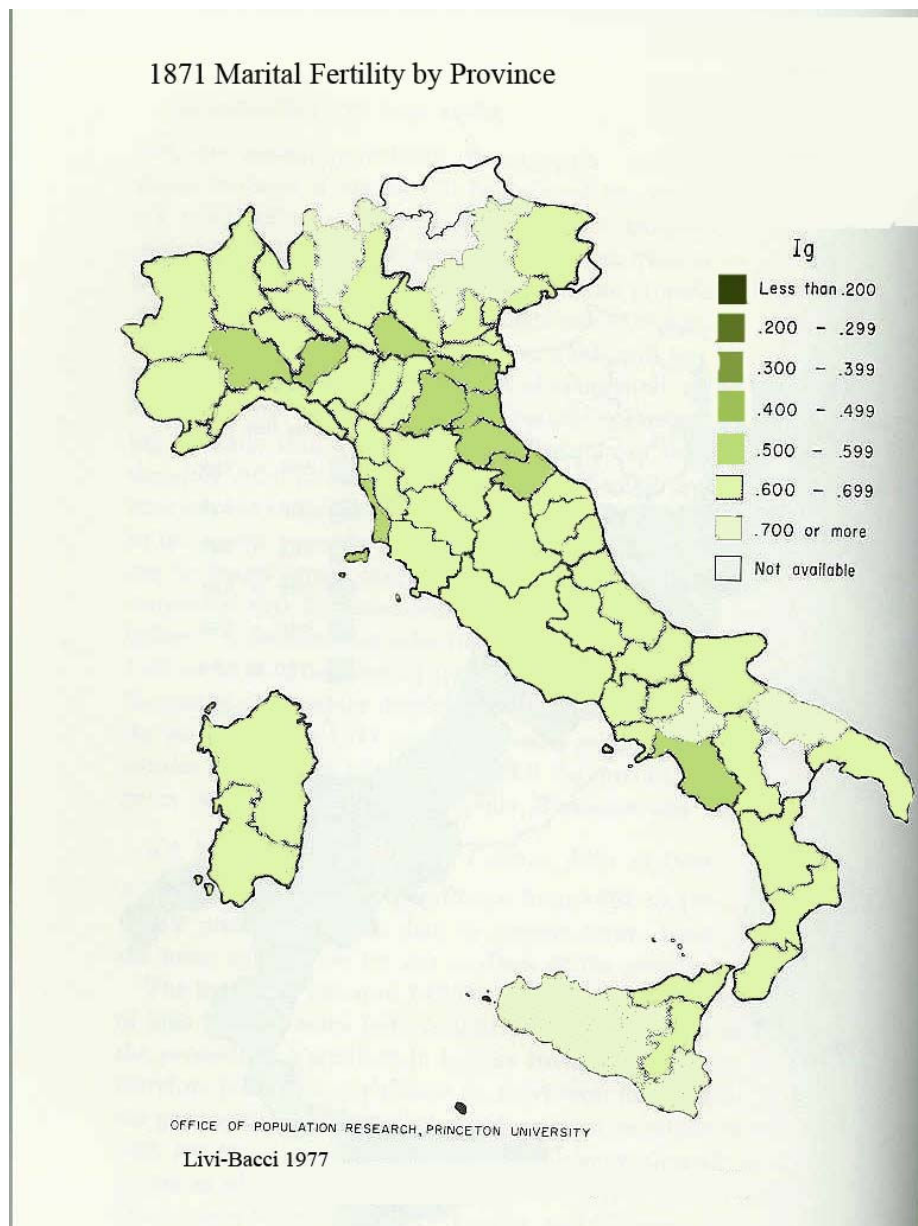Schofield, Roger, and David Reher, 1991. *The Decline of Mortality in Europe*,

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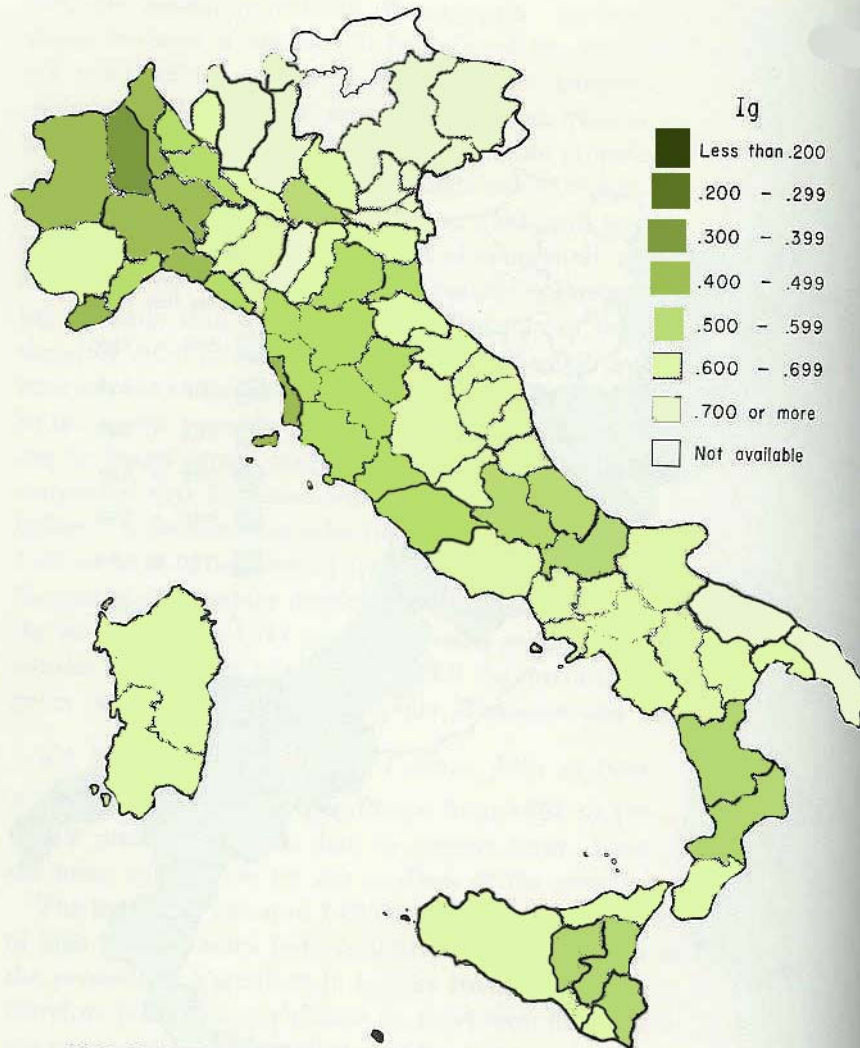
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Table 1: Transition Indicators by Region

Reigon	Extra marital Births 2000	Extramarital births 2003	increase births	cohab2001	lg1871	lg1911	lg1961	lm1871	lm1911	lm1961
Piemonte	14.04	17.98	3.94	5.21	0.63	0.48	0.23	0.57	0.51	0.62
Valle d'Aosta	17.59	23.76	6.17	8.2	.	.	.	.	.	.
Lombardia	11.29	16.35	5.06	4.97	0.66	0.62	0.29	0.57	0.54	0.58
Trentino-Alto A	20.59	23.72	3.13	4.96	.	.	0.42	.	.	0.51
Bolzano-Bozen	29.7	31.38	1.68	.	.	.	.	.	.	.
Trento	11.11	16.13	5.02	.	.	.	.	.	.	.
Veneto	10.03	14.44	4.41	3.85	0.68	0.74	0.34	0.59	0.51	0.57
Friuli-Venezia	13.64	16.31	2.67	5.42	.	.	0.21	.	.	0.59
Liguria	18.42	23.87	5.45	5.55	0.63	0.49	0.22	0.56	0.49	0.59
Emilia-Romagna	17.78	22.87	5.09	5.97	0.6	0.65	0.24	0.58	0.54	0.62
Toscana	14.78	21.37	6.59	4.24	0.66	0.55	0.23	0.56	0.54	0.62
Umbria	8.4	11.36	2.96	2.57	0.6	0.61	0.24	0.53	0.48	0.65
Marche	7.93	12.93	5	2.74	0.62	0.65	0.27	0.5	0.54	0.62
Lazio	9.78	11.82	2.04	3.97	0.61	0.56	0.36	0.57	0.51	0.52
Abruzzo	4.23	7.6	3.37	1.82	0.64	0.6	0.32	0.58	0.57	0.61
Molise	3.79	3.66	-0.13	1.09	.	.	.	.	.	.
Campania	5.25	7.19	1.94	1.57	0.67	0.67	0.49	0.56	0.52	0.54
Puglia	6.84	9.15	2.31	1.66	0.7	0.41	0.47	0.58	0.56	0.55
Basilicata	2.81	3.51	0.7	0.89	0.65	0.65	0.43	0.61	0.63	0.62
Calabria	4.27	5.65	1.38	1.43	0.64	0.61	0.46	0.57	0.58	0.59
Sicilia	8.68	10.08	1.4	1.95	0.7	0.61	0.41	0.56	0.57	0.59
Sardegna	8.96	14	5.04	2.38	0.63	0.67	0.55	0.57	0.49	0.49
ITALIA	10.16	13.75	3.59	3.64	0.65	0.62	0.39	0.56	0.53	0.58
Nord	13.38	17.97	4.59	5.12	0.64	0.62	0.29	0.58	0.52	0.57
Centro	10.9	14.75	3.85	3.78	0.63	0.59	0.24	0.44	0.53	0.6
Mezzogiorno	6.45	8.49	2.04	1.56	0.67	0.6	0.47	0.57	0.56	0.56

Maps: First Demographic Transition : Marital fertility

1871 Marital Fertility by Province

Ig
- Less than .200
- .200 — .299
- .300 — .399
- .400 — .499
- .500 — .599
- .600 — .699
- .700 or more
- Not available

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Livi-Bacci 1977

1911 Marital Fertility by Province

Ig
Less than .200
.200 - .299
.300 - .399
.400 - .499
.500 - .599
.600 - .699
.700 or more
Not available

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1961 Marital Fertility by Province

Ig
- Less than .200
- .200 – .299
- .300 – .399
- .400 – .499
- .500 – .599
- .600 – .699
- .700 or more
- Not available
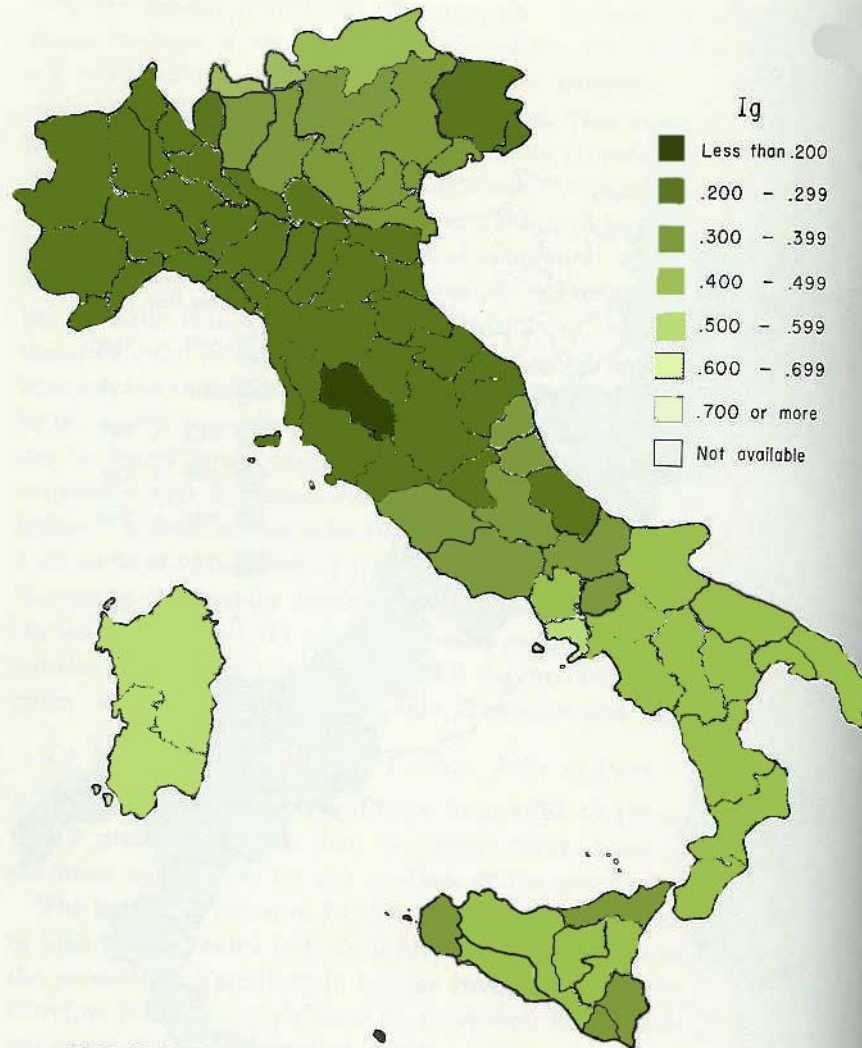
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Livi-Bacci 1977

Maps: First Demographic Transition Proportion Married
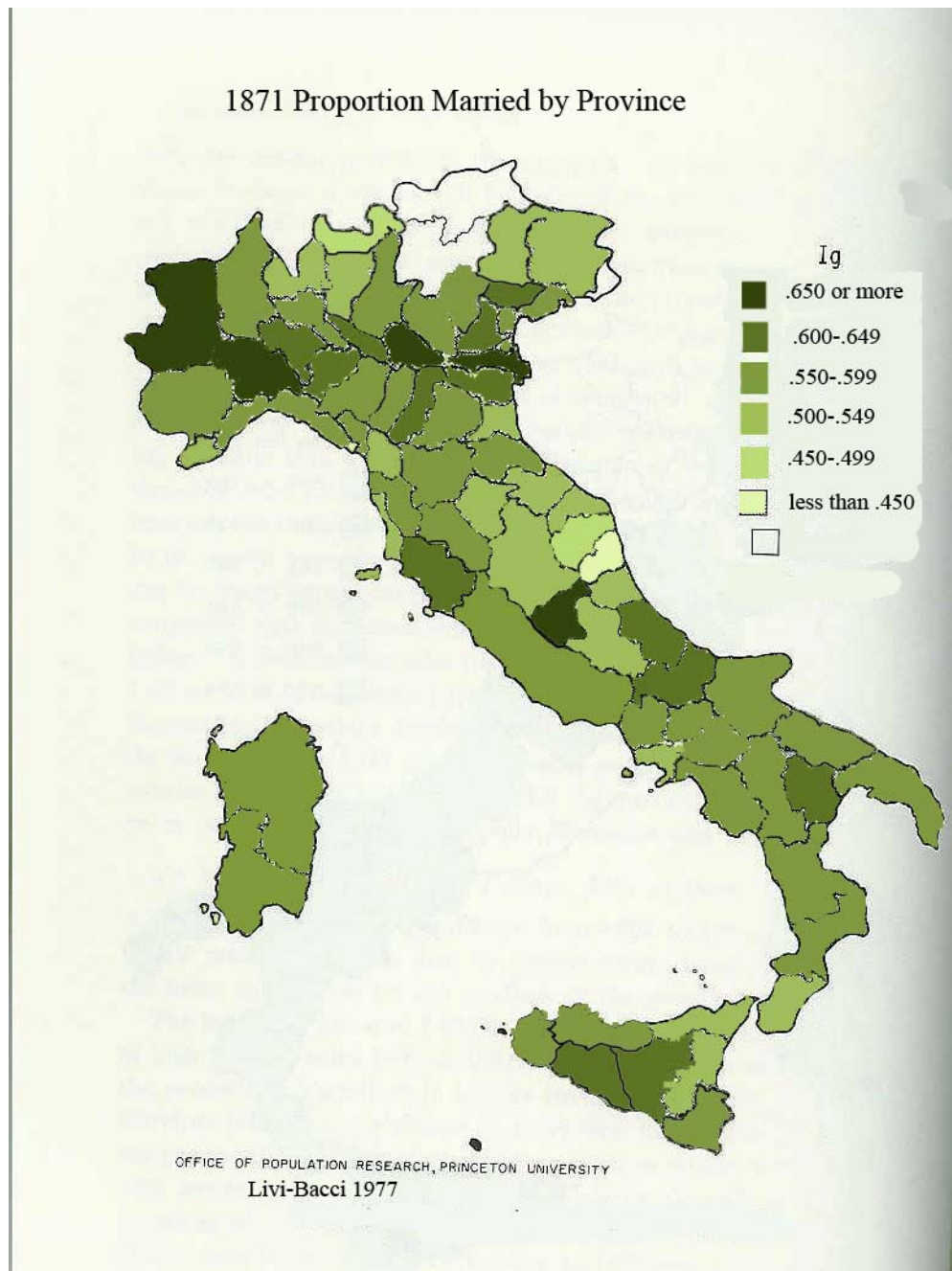
1871 Proportion Married by Province

Ig
- .650 or more
- .600-.649
- .550-.599
- .500-.549
- .450-.499
- less than .450

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Livi-Bacci 1977

1911 Proportion Married by Province

Ig
- .650 or more
- .600-.649
- .550-.599
- .500-.549
- .450-.499
- Less than .450
- Not Available
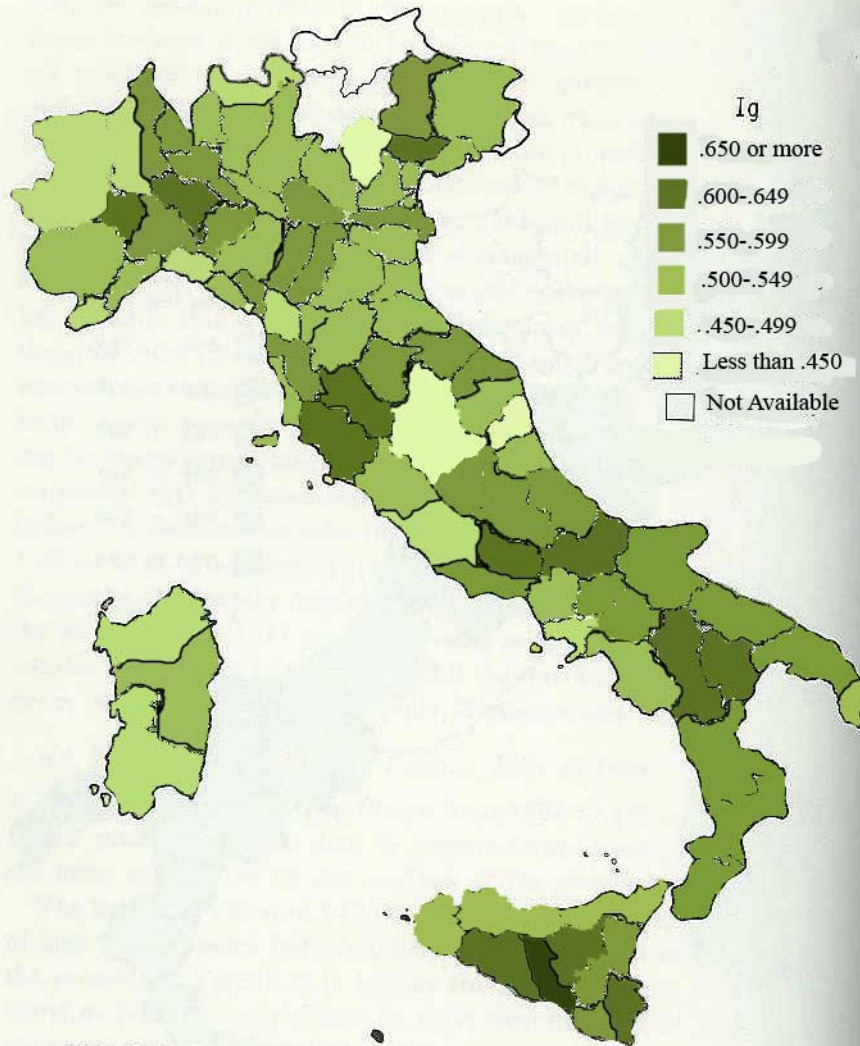
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Livi-Bacci 1977

1961 Proportion Married by Province

Ig
- .650 or More
- .600-.649
- .550-.599
- .500-.549
- .450-.499
- Less than .450
- Not Available
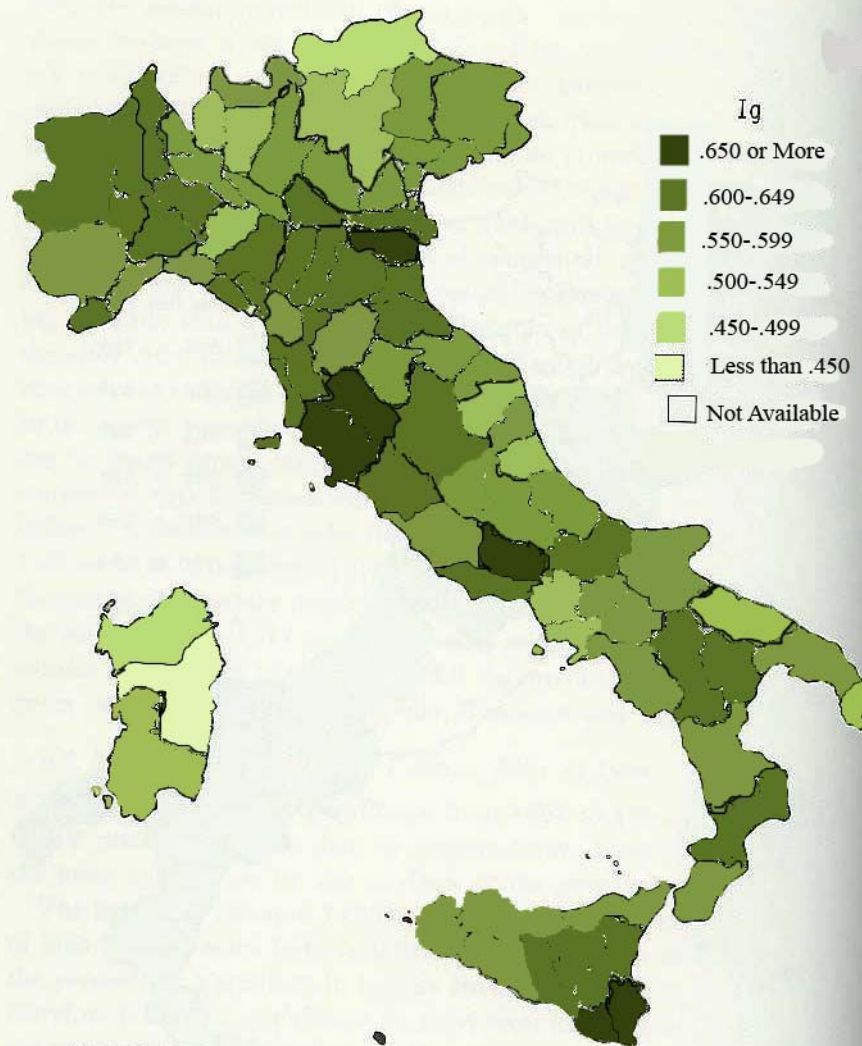
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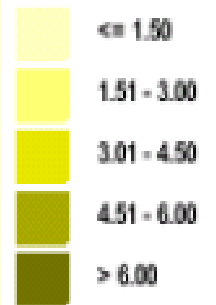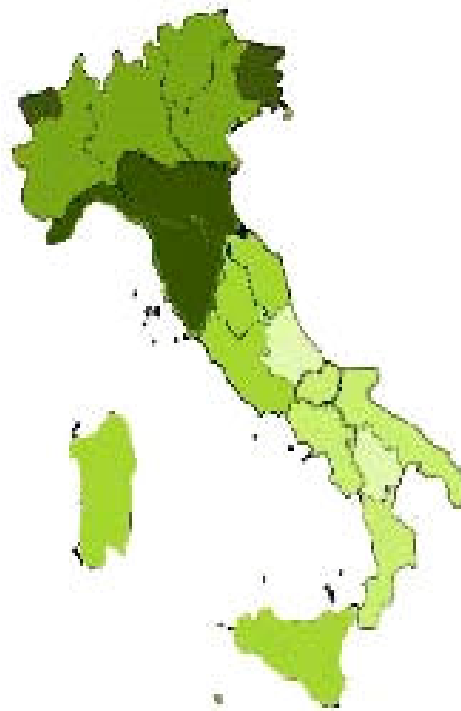Livi-Bacci 1977

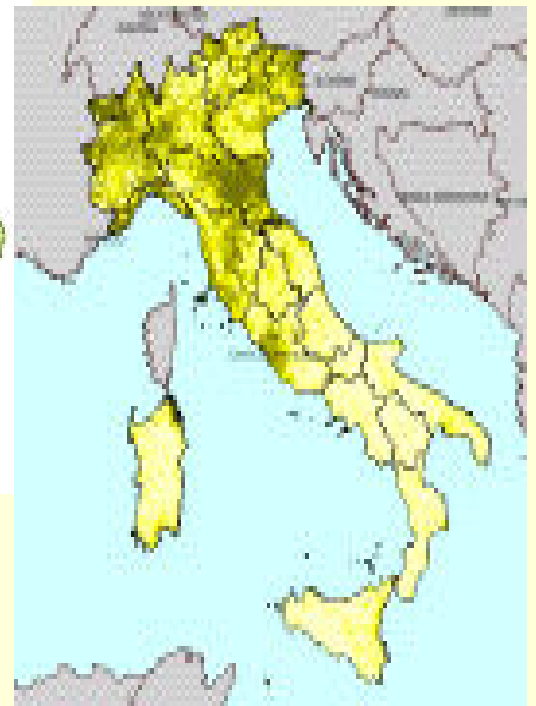**Maps: Second Demographic Transition**

2000 Extra marital births by Region
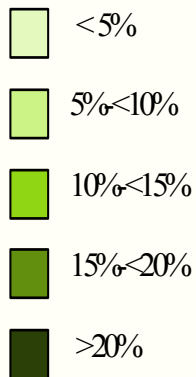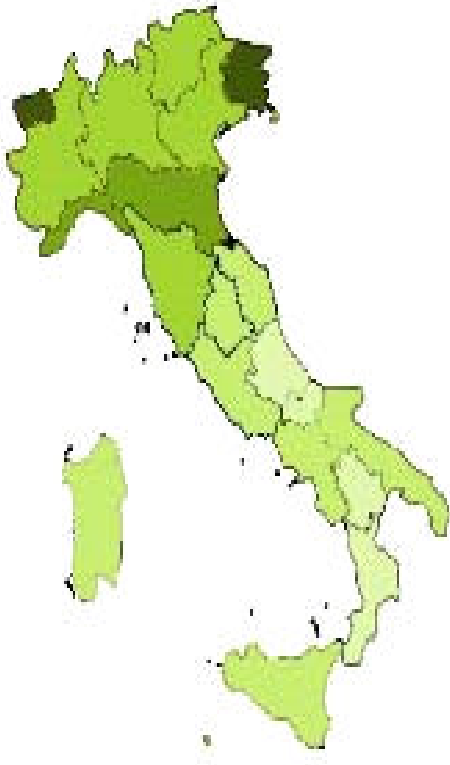
Second Demographic Transition:

Extra Marital Births 2000 and 2003, Cohabitation 2001

2003 Extra marital births by Region

	<= 1.50
	1.51 - 3.00
	3.01 - 4.50
	4.51 - 6.00
	> 6.00

2001 Percent cohabitation

	< 5%
	5% < 10%
	10% < 15%
	15% < 20%
	> 20%

Source: ISTAT, Annuario Statistico Italiano 2001, 2004; Council of Europe, Demographic Yearbook 2003.

Table 2 : Pearson's Correlations

	Extra Marital Births 2000	Extra Marital Births 2003	Percent Cohabitation 2001
Fertility Rate 1871	-.292	-.296	-.374
Fertility Rate 1911	-.245	-.185	-.146
Fertility Rate 1961	-.523*	-.571**	-.698***
Proportion Married 1871	-.071	-.105	-.055
Proportion Married 1911	-.571**	-.589**	-.553*
Proportion Married 1961	-.038	.007	.076

*P<0.05   **P<.01   ***P.001

Scatter Plots: Proportion Married 1911 and Fertility Rate 1961