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THE GEOGRAPHY OF WELL-BEING IN ITALY AN EXPLORATORY ANALYSIS

The geography of well-being [...] focuses on the set of relations that people weave with each other and with their territory, to understand the satisfactions they derive from these relations and the inequalities that result from them.

A. S. Bailly (1982, p. 53), [transl.]

Abstract - This research explores the geographic distribution of well-being within Italy. Prior studies extensively analysed the correlation between well-being and a range of heterogeneous life domains (wealth and work conditions, health and personality, education. etc.) at national level. The present study aimed to extend previous work by adopting a regional level of analysis and demonstrating that the geographic distribution of objective well-being does not correspond with that of subjective well-being, measured in terms of life satisfaction. The results also suggest that some life domains (i.e. population density, air quality) generally considered determinants of national well-being, seem not to have any impact on the regional perception of well-being and also that some partially still unexplored life domains such as the social relationships or the levels of “civiness” have a prominent role in drawing the geography of subjective well-being in Italy.

Introduction – Happiness has traditionally been the reserve of philosophical, psychological and social studies, but since the seventies happiness and its corollaries (well-being and life satisfaction) have increasingly attracted the attention of economists, geographers and ecologists. The debate surrounding the informational power of GDP (Gross Domestic Product) as the only measure of well-being is, related in fact, to studies in these fields. Even the UN (United Nations) showed interested in the topic, commissioning the World Happiness Report based on six economic and non-economic indices. This report identified the countries with the highest levels of happiness (Denmark, Norway and Switzerland, in 2013) and showed an increase in the levels of well-being in the countries of sub-Saharan Africa and Latin America while highlighting “the decline of happiness” in most industrialised countries. In Italy, since 2010, ISTAT (Italian National Statistics Institute) in conjunction with the CNEL (National Council for Economy and Labour) has undertaken the BES Project to identify and survey a series of indicators for fair and sustainable well-being at regional level.

There is, therefore, a shared interest in this topic, especially in this period of negative economic trends that has led to a profound reflection on the role of economic growth as the sole determinant of well-being.

The present study, which has its conceptual roots in the study of the role of social relations in the economy, uses the statistical tool of linear correlation to verify if, and how, the most popular indicators in the literature manage to capture the distribution of subjectively perceived well-being in the

Italian regions. After outlining the main conceptual and methodological issues and briefly describing the indicators used for the *life domains*¹, the empirical results will be presented in two separate paragraphs² following a precise logical-analytical model.

Well-being, life satisfaction and happiness: conceptual and methodological issues – One of the main problems of research related to the so-called geography of well-being is the definition of the concepts of well-being, life satisfaction and happiness and the relationship between them. “*Concepts are the foundations of indicators and are essential to the effective use of an indicator*” (Neufville, 1975, p. 141): indicators can only express their function fully in relation to the specific theoretical and conceptual spectrum to which they refer. Dale (1980, p. 504) states, “[...] *it has to be stated that the terms “well-being”, “quality of life” and “social welfare” are not straightforward concepts in the sense that there exist any generally accepted theory or model explaining and defining them. Rather, several divergent approaches and models have been developed [...] the different concepts will be used in their broadest, most general meaning, and as if they were synonymous*”. Even today, there is no clear distinction between the concepts. In fact, Inglehart *et al.* (2008), combine the level of life satisfaction and happiness in a single index, while Dale (1980) and Bramstron *et al.* (2002), use the three terms interchangeably. The present study, which is exploratory, avoids the conceptual debate in favour of a measure of subjective well-being “gauged” in terms of life satisfaction as distinct from objective well-being.

Other conceptual problems are the measurability of well-being, the choice of subjective and/or objective indicators and the external influence of subjective indicators.

According to the specific definition of well-being selected, it is possible to “create” one or more social indicators that allow direct measurement of certain *states* in the observed population (Land, 1975). Bailly (1982, p. 24) provides an enlightening view: “*Does the importance of well-being reside in external phenomena, then, or in individual or group ideologies? Undoubtedly, the answer lies in both and the researcher is faced with the eternal dialectic between inner being/outward appearance, essential values/material values*” [transl.]. Well-being, defined as a concept that can be split into life domains (van Praag *et al.*, 2003) can be measured using a mix of objective indicators, “*quantitative ‘facts’ selected from census data and other accessible register*” (Dale, 1980, p. 504) and subjective indicators, “*based on direct reports from individuals about their own perceptions and feelings*” (*ibid.*, p. 504). While it is generally easy to access objective indicators and they are unlikely to be questioned, only the subjective indicators provide information on the assessments and aspirations of individuals, though the latter give rise to measurement issues (Larsen e Fredrickson, 1999).

A third series of concerns regard the choice of the life domains into which the concept of well-being should be divide. The large body of research that has explored the *happiness-wealth* connection (Diener *et al.*, 1995, Inglehart and Klingemann, 2003; Diener and Lucas, 1999; Florida *et al.*, 2013) both measuring the wealth in absolute terms (Easterlin 1974, 1995) and relative terms (Deaton, 2008; Stevenson and Wolfers, 2008) showed that the individual's perception of well-being is influenced more by the average wealth of the community in which they live (Graham, 2008; Glaeser *et al.*, 2009), by the social context (Helliwell and Putnam, 2005) and by comparison of their status with the previous expectations (Stutzer, 2004) than by the wealth they possess in absolute terms (Mitchell, 1972; Easterlin, 1995). The level of material wealth does not fully explain the level of perceived well-being which is therefore “*multidimensional, comprising a number of life domains which people weight differently according to how important each is in their life*” (Morrison, 2011, p. 1042).

More recent literature has increasingly focused on non-economic indicators. Cummins (1996) identifies seven life domains affecting well-being (*emotional well-being; health, family connections, material wealth or well-being, work, safety e community*); Helliwell and Putnam (2005) posit four categories of *powerful predictors* (genetic and personality factors, social factors, physical health, economic position) while Layard (2005) talks of “The Big Seven” (family relationships, financial situation, work, community and friends, health, personal freedom, personal values) that affect well-being and the way in which it is perceived.

In his seminal work Bailly (1982) highlights another “open question”: “*If the determinants of well-being cannot be separated from the values, legitimized by the dominant society groups, the level of life satisfaction partially depends on spatial support, namely on the set of geographical embeddedness constraints which could prevent or foster the full development of the population*” (p. 32); “[...] *the research into well-being and the causes of dissatisfaction represent a new way to evaluate the social desirability of the geographic conditions*” (*ibid.*, pp. 29-30) [transl.]. (pp. 29-30). More recently Baum *et al.* (2010, p. 468) stated “[...] *place matters-where you live is associated with your social and economic prospects. [...] place are important in obtaining a fuller picture of a range of social and economic phenomena and that place itself might be thought of as suitable arena within which to develop programmes is not lost on those changed with designing policy*”. Place would seem to be both the scenario for the empirical investigation and an essential life domain³.

As a scenario, the environment can be interpreted only by the use of a scale that enables us to avoid geographical short-sightedness (Bailly, 1982, p. 78). Many empirical studies have dropped the traditional national perspective in favour of the measurement of well-being at a regional, metropolitan and district level (Baum *et al.*, 2010; Permentier *et al.*, 2011; Florida *et al.*, 2013). In spite of these efforts, there is no agreement on the optimal geographical scale: “*Characteristics of the socio-demographic context such as the presence of residential stability [...], the degree of racial/ethnic heterogeneity [...] or the level of economic resources [...] may be particularly important for fostering satisfaction. Although this growing body of literature provides important evidence, left unaddressed is question of the appropriate geographical area for measuring such contextual factors*” (Hipp, 2010, pp. 2517-2518).

Concept operationalization: objective and subjective well-being, life domains and geographical scale. – Two distinct definitions of well-being have been adopted in empirical analysis: objective well-being and subjective well-being. The former can be calculated by summing, with the precautions that will be explained below, the values of the indicators most frequently used in the literature as predictors of well-being. Subjective well-being, on the other hand, is “the result of a relation between a person and/or a group and a status or a good; it is an obviously subjective interpretation of the world, a quality that we attribute to a type of relation” (Bailly, 1982, p. 17), and can therefore only be obtained by incorporating an indicator of self-assessment of well-being (this study uses the level of *life satisfaction*) as a cut-off for objective indicators of well-being. The level of life satisfaction can be defined as “*a cognitive judgment based on the attainment of some standard or aspiration*” (Corrado *et al.*, 2013, p. 545), “[...] *result [of] a process of appraisal, perception, evaluation and coping (adaptive) behaviour*” (van Kamp *et al.*, 2003 p. 10).

The selection of the indicators of well-being and their classification in six life domains (Wealth, Culture and Education, Social Relations, Civicness and Community, Physical and Psychological health, Environmental quality) stem from an analysis of the recognized empirical studies published to date.

Research has hitherto concentrated on wealth indicators. Diener *et al.* (1995) demonstrated a strong correlation between the average level of wealth and perceived well-being. A study by Inglehart (1990) showed that 85% of those who have a stable financial situation reported satisfaction, compared to 57% of those with inferior economic conditions. Two longitudinal studies have shown that people with a history of unemployment appear to be less happy (Palisi, 1987) and that the level of perceived well-being also depends on the type of work performed (Inkeles and Diamond, 1986). Various attempts have been made to demonstrate the paradox of the happy poor and to ascertain the impact of cultural and social differences on the relationship happiness-income (Veenhoven, 1989; Alvaro and Marsh, 1989; Morrison, 2011).

The role of the life domain “Culture and education” is inherently ambiguous: if the contributions of Campbell (1981), Witter *et al.* (1984) and Diener *et al.* (1999) showed only a weak correlation between the level of education and the level of life satisfaction, other studies (Lawless and Lucas, 2011; Florida *et al.*, 2013) have demonstrated the existence of a strong correlation between human capital and perceived well-being. The predictive value *tout court* of the indicators in question is partly affected by their indirect impact on indicators of economic well-being. It is reasonable to assume there exists a correlation between education and income that does not make it possible to isolate completely the life satisfaction-education relationship. It was also observed that: “*The effects of education in*

most European countries are also quite small, and it is also weak in Japan and Singapore [...] This suggests that the key variable is national wealth-education has more effect in poorer countries” (Argyle, 2003, p. 355).

If man is by nature a political animal, ‘ζῷον πολιτικόν’ then his need for socialisation conditions his happiness (Lucas e Dyreforth, 2006). Burt (1996) estimated that those who have at least five friends have a greater chance of feeling happy. Inglehart (1990) identified a positive correlation between religiosity and well-being, though Veenhoven (1995) observed that this correlation varies considerably according to the confession, age, gender and ethnicity. Lynn and Smith (1991) meanwhile, studied the impact of carrying out voluntary activities on the perception of well-being.

The aforementioned need for sociality is also reflected in the propensity to trust and the need for security, “*Trust and norms of civic cooperation are essential to well-functioning societies, and to the economic progress of those societies*” (Knack and Keefer, 1997, p. 1283). In a recent study, Morrison (2011) showed that out of 22 categories of variables belonging to this life domain, no less than 15 are significantly correlated with the levels of well-being: in particular, the strong sense of community and security significantly affect the perception of well-being (Baum *et al.*, 2010; Hipp, 2010).

Lawless and Lucas (2011) identified a significant correlation between life satisfaction and a broad set of health indicators (physical health, percentage of obese people, the percentage of people with disabilities, the spread of deadly diseases, etc.), showing a particularly robust relation to perceived well-being (Helliwell and Putnam, 2005). Other studies observed that older people, although they may often be less healthy, appear to be happier than people are in middle age (Deaton, 2008) and that the impact of life expectancy on the level of perceived well-being is still controversial (Stock *et al.*, 1983; Argyle, 2003).

The domain of environmental quality has attracted increased attention. Larson (2010) stressed the need for an integrated approach that considers diverse environmental indicators: air quality (MacKerron and Mourato, 2009); environmental quality (Ferrer-i-Carbonell and Gowdy, 2007), scenic beauty (Florida *et al.*, 2011), sustainability and livability (van Kamp, 2003) all have a positive influence on life satisfaction. The impact of a location’s reputation (Hipp, 2010; Permentier *et al.*, 2011) and the existence of a *rural advantage* (Schucksmith *et al.*, 2009) are more controversial indicators as they may be affected by *focusing illusions* (Schkade e Kahneman, 1998).

Table 1 – *Definition of the indicators⁵ for life domains. The indicators with a negative content are marked by “^o”*

<i>Wealth</i>	<i>Civiness and community</i>
Income (per capita)	(from previous column)
GDP (per capita)	Sexual assault rate
Employment rate	Perceived crime risk
Percentage of employed in irregular work	Voters
People at risk of poverty	Trust in political parties
NEET (Not engaged in Education, Employment or Training) rate	Murder rate
<i>Culture and Education</i>	<i>Physical and psychological health</i>
Graduates	Psychological health
Newspaper readers	Life expectancy
Book readers	Physical health
Expenditure on cultural activities	Childhood mortality rate
<i>Social Relations</i>	<i>Environmental Quality</i>
Satisfaction with family relations	Illegal building development
Satisfaction with friendships	Public expenditure on heritage conservation
Activism ⁶	Recycling
Voluntary work	Electricity consumption from renewable sources
Religiosity	CO ₂ emissions
Strong network of friends	Urbanization in protected areas
<i>Civiness and community</i>	Cultural heritage
Perception of personal safety	Green zones in urban areas
General level of trust	Areas of outstanding natural beauty
Trust in local government	Contaminated areas
Trust in Parliament	Population density

Source: own elaboration of data from CRESME Research centre, ISTAT (Italy's National Statistics Institute), The Italian Ministry of the Environment and Protection of Land and Sea of Italy and Italian Ministry of Interior

In order to understand the distribution of well-being in Italy the average level was calculated at a regional rather than a national level:

“[...] studies of cross-national well-being cannot address within-nation variance, which may exist despite the cultural and economic homogeneity of a nation. Importantly, this within-nation variance will be most relevant in the use of well-being to determine policy decisions. Understanding the extent to which regional differences in well-being exist-along with the factors that are associated with these differences-is an important goal, both for theoretical and applied reasons.”

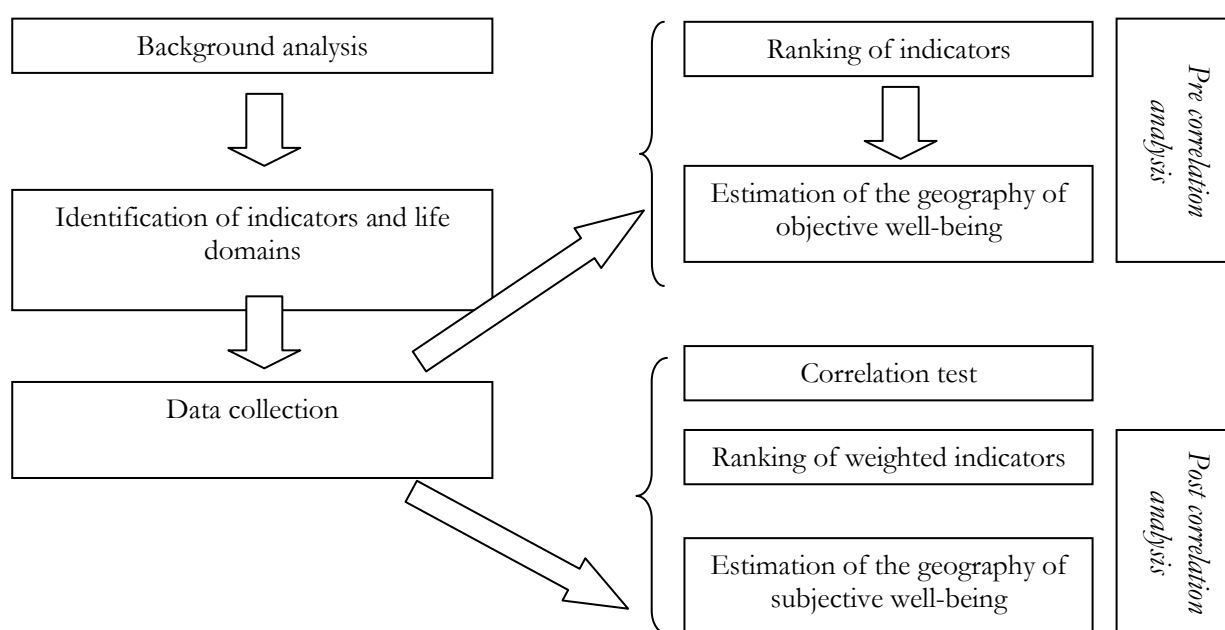
(Lawless e Lucas, 2011, p. 342).

Regions could be considered *ontologically pre-given* or *socially constructed* (Mackleod and Jones, 2007): from an ontological perspective they correspond to the administrative partitions of a nation while from a social point of view regions are “*not necessarily bounded by administrative ones, [but] represent the confluence of common interests, beliefs, and principles about social and economic aspects*” (Murias *et al.* 2012). Although the 20 Italian regions are not internally homogeneous from a historical, cultural, economic and geographical point of view, it was decided to adopt a regional scale in order to benefit from the rich database available that is generally structured on regional lines.

The indicators mentioned above derive from the extensive data warehouse of the Italian National Statistics Institute (ISTAT). The main sources of this study, used also in the 2013 BES Report⁷, included the sampling survey “Aspects of daily life” conducted yearly (generally in February) and carried out as part of the “Multi-purpose household survey”, the “Survey on Income and Living conditions (EU-SILC)” carried out by a rotated panel and anchored in the European Statistical System and the “Labour force survey” conducted weekly. The sample size of the surveys ranges from 24,000 to 77,000 households, generally selected at random in from the registry lists of 850 Italian municipalities. The data are then aggregated at the regional level according to the municipality of residence of the sample units surveyed.

The logic model and the methodology – As shown in Picture. 1 the background analysis made it possible to identify the life domains and the indicators most widely used as predictors of well-being. These indicators were taken from the fragmented database available, to outline a geography of objective well-being. For each indicator we drew up a ranking by allocating a score between 1 and 20 to each Italian region; the ‘positive’ indicators were ranked in descending order (from 20 to 1) while the “negative” indicators, marked with “-” in Tab. 1, were scored in ascending order (from 1 to 20). To obtain the final result the positive values were added together, while the negative ones were subtracted.

At the next stage, we checked the correlation between each indicator and the level of life satisfaction in order to verify whether these indicators could effectively measure subjective well-being as perceived in Italy. Following the previous method, a second map of well-being⁸ was drawn up by considering each indicator weighted for the correlation coefficient.



Picture 1 – *The logic model*.

Source: own elaboration.

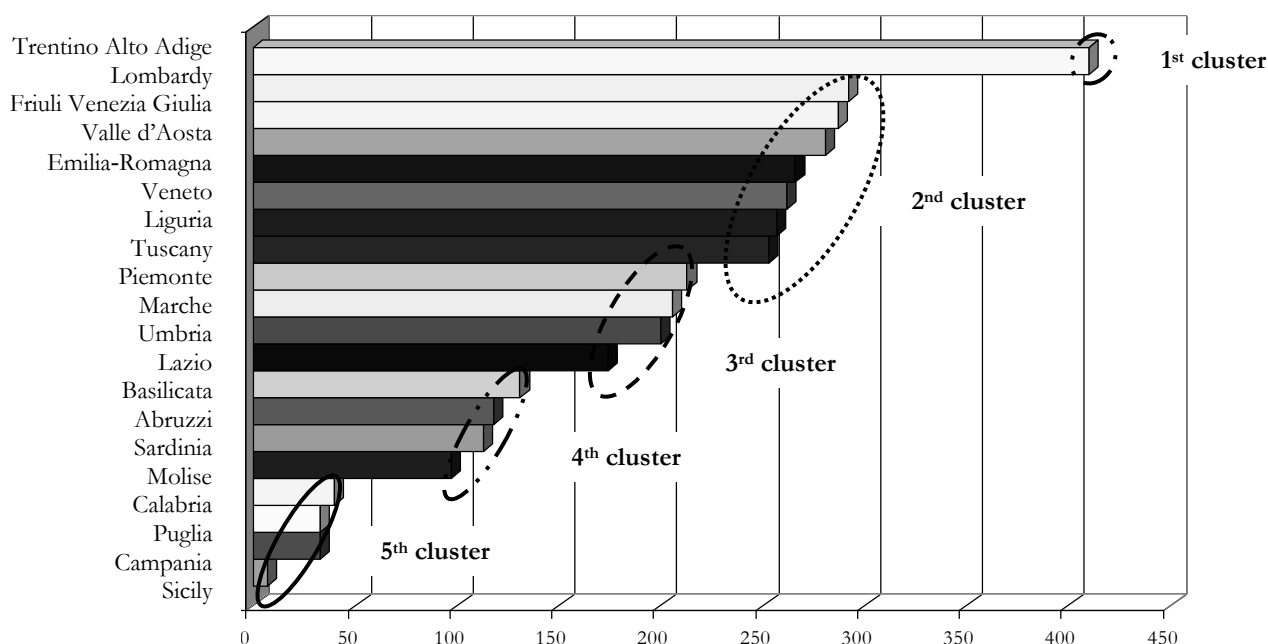
From a statistical point of view, the linear correlation method enables us to understand how one variable changes according to shifts in another variable (Bohrnstedt e Knoke, 1998)⁹. The Pearson coefficient (ρ_{xy})¹⁰, which can assume values between -1 and 1 ($-1 \leq \rho_{xy} \leq 1$), indicates the direction of the covariation and its strength: in particular, if $\rho_{xy} > 0$, the variables are directly correlated; if $\rho_{xy} = 0$ the variables are not correlated; if $\rho_{xy} < 0$ the variables are indirectly correlated. As far as the strength of the correlation is concerned, if $0 \leq \rho_{xy} \leq \pm 0.3$ the correlation is weak; if $\pm 0.3 \leq \rho_{xy} \leq \pm 0.7$ the correlation is moderate; if $\rho_{xy} \geq \pm 0.7$ there is a strong correlation.

The correlation parameters were also tested for significance to estimate the probability with which “the hypothesized relations are present in the population under investigation” (Bohrnstedt e Knoke, 1998, p. 31). When the *p-value*¹¹ is less than 0.5 (1 asterisk), less than 0.1 (2 asterisks) or less than 0.001 (3 asterisks) the correlation is significant. The lower the p-value the higher the significance of the estimate.

Pre-correlation analysis and results – Given the heterogeneity of indicators, during the pre-correlation analysis the algebraic sum of the regional rankings of each indicator was calculated; the

indicators of the same life domain were then ranked and finally an overall ranking for relative “well-being positions” was made.

The graph below (Picture 2) summarizes the results of this first level of analysis: the regions with the highest and lower levels of overall objective well-being are respectively Trentino Alto Adige, Friuli Venezia Giulia, Valle d’Aosta and Sicily, Puglia, Campania, Calabria. The North-South gap is very clear: there are a notable 403 “well-being positions” separating Trentino Alto Adige from Sicily. A closer analysis highlights a fairly uniform well-being distribution within five identifiable clusters: with the exception of Trentino Alto Adige whose particular characteristics set it apart, seven regions present an equally high level of objective well-being (Lombardy, Friuli Venezia Giulia, Valle d’Aosta, Emilia-Romagna, Veneto, Liguria and Tuscany). Average levels of well-being are observed in the third cluster (Piedmont, Marche, Umbria and Lazio), while in the fourth (Basilicata, Abruzzi, Sardinia, Molise) and fifth groups (Calabria, Puglia, Campania and Sicily) the overall level of objective well-being is considerably lower.



Picture 2 – *The geography of objective well-being.*
 Source: own elaboration with ISTAT data

The “relative positions” for each life domain were observed to gain a better understanding of the causes of this divide in the levels of well-being.

As regards the indicators for economic well-being, it is not surprising that Valle d’Aosta, Lombardy, Trentino Alto Adige and Emilia-Romagna are far wealthier than the extreme Southern regions. However, the geography of well-being changes slightly if we consider the “Culture and Education”, “Social relations” and “Civicness and community” life domains. The cultural indicators highlight a clear divide between the Northern and the Southern regions. Indeed, between Trentino Alto Adige and Campania (the first and the last in the cultural life domain rankings) there are 235 “well-being positions” and the highest-placed Southern region (Sardinia) appears in thirteenth position overall in this ranking. The geography of social and civic well-being seems to confirm the greater average “civicness”, as this concept was dubbed by Robert Putnam, of the northern regions. It is, however, surprising that regions such as Trentino and Basilicata are characterized by higher levels of civic and social well-being compared with regions such as Piedmont, Lazio and Emilia-Romagna, which are historically more politically active.

Table 2 – *Value and relative ranking (per region) of the indicators of “Wealth”, “Culture and Education” and “Social Relations”.*

	Wealth		Culture and Education		Social Relations	
	Value of the sum	Relative ranking	Value of the sum	Relative ranking	Value of the sum	Relative ranking
Abruzzi	-14	13	36	14	29	19
Basilicata	-38	17	28	15	60	11
Calabria	-52	20	-20	19	37	16
Campania	-43	18	-23	20	25	20
Emilia-Romagna	41	4	151	5	82	4
Friuli V. G.	19	6	152	4	104	2
Lazio	8	10	77	11	55	13
Liguria	18	7	111	8	65	10
Lombardy	46	2	161	2	82	5
Marche	4	11	80	10	60	12
Molise	-32	15	27	16	38	15
Piedmont	9	9	110	9	76	7
Puglia	-35	16	9	17	36	17
Sardinia	-27	14	61	13	75	8
Sicily	-45	19	-13	18	35	18
Tuscany	16	8	141	7	82	6
Trentino A. Adige	44	3	212	1	112	1
Umbria	1	12	76	12	52	14
Valle d'Aosta	48	1	158	3	70	9
Veneto	32	5	146	6	85	3

Source: own elaboration of ISTAT data.

Good levels of physical and psychological health were observed in Valle d'Aosta, Lombardy, Trentino Alto Adige, Tuscany, Veneto and Friuli Venezia-Giulia while Sardinia, Abruzzi and Liguria exhibit high levels of environmental quality well-being.

Table 3 – *Value and relative ranking (for region) of the indicators of “Civicness and Community”, “Physical and Psychological health” and “Environmental quality”.*

	Civicness and Community		Physical and Psychological Health		Environmental Quality	
	Value of the sum	Relative ranking	Value of the sum	Relative ranking	Value of the sum	Relative ranking
Abruzzi	13	18	21	11	54	5
Basilicata	57	5	6	17	24	18
Calabria	16	17	-5	19	24	19
Campania	41	13	-5	20	22	20
Emilia-Romagna	45	9	28	7	51	8
Friuli V. G.	54	7	29	5	54	6
Lazio	43	11	14	14	49	10
Liguria	74	1	28	8	74	2
Lombardy	66	2	33	4	28	16
Marche	44	10	16	13	43	13
Molise	43	12	21	12	49	11
Piedmont	37	15	25	9	38	14
Puglia	37	16	8	16	30	15
Sardinia	4	19	13	15	71	4
Sicily	-5	20	-3	18	25	17
Tuscany	64	3	43	2	50	9
Trentino A. Adige	58	4	56	1	81	1
Umbria	52	8	23	10	48	12
Valle d'Aosta	56	6	40	3	74	3
Veneto	41	14	29	6	54	7

Source: own elaboration of ISTAT data.

Correlation test – The indicators used in the first level of analysis were correlated¹² with the regional level of life satisfaction in order to verify which of them can actually predict perceived well-being at a regional level.

The results of the correlation analysis (see Tab. 4) highlight a strong correlation between wealth and subjective well-being. In particular, the percentages of NEET, the percentage of people at risk of poverty and the employment rate are the indicators most closely correlated with regional life satisfaction levels. These three indicators are linked with perceptions of social equity and people's expectations: i.e. being employed or unemployed, poorer or richer, conditions affect not only current choices and expenditure but also those of the future. The weaker correlation between traditional economic indices (GDP and the average income per capita) proves the assumption of this study that the most widely used indicators are not fully predictive of subjective well-being.

The correlation test between the regional life satisfaction levels and the indicators of “Culture and Education” reveals that the percentage of graduates correlates less with the average level of life satisfaction than ephemeral indicators such as the percentages of book readers, of newspaper readers and the average individual expenditure on cultural activities. This phenomenon could be explained by considering that the Italian labour market often fails to consider the educational level of job applicants. On the other hand, although time spent reading a book or in a cultural activity (cinema, theatre, concerts, etc.), may not have a direct impact on economic situation, it does provide an escape from routine and the perception of a higher level of satisfaction.

The life domains “Social Relations” and “Civicness and Community” play a crucial role: the general level of trust, levels of activism and voluntary work better predict the level of well-being than the aforementioned wealth indicators. Social relations, in the widest sense of the term, provide support for individuals and determine a higher level of life satisfaction especially where the economic context is fragile, as in Italy. The negative correlation between religiosity and a strong network of friends with life satisfaction is unexpected. The level of trust in local government is very strong correlated with the

regional life satisfaction levels, whereas the absence of any correlation between perceived well-being and the indicators “Trust in Parliament”, “Trust in political parties” and “Percentage of voters” should set the alarm bells ringing. Other predictors of well-being emerging from the correlation test are “Public expenditure on the conservation of cultural heritage” and the “Perception of personal safety”.

In the domain of “Physical and psychological health”, the indicator of physical health correlates most closely with the regional percentage of satisfied people; the other two indicators, (life expectancy and psychological health) play a marginal role. Two methodological limitations should, however, be noted: firstly, the data taken from the database do not always refer to the same year¹³ and the indicators are strongly auto-correlated.

Environmental indicators are overall the least predictive of subjective well-being: only the percentage of municipalities that recycle waste and the per cent regional consumption of renewable energy are significantly correlated with the level of life satisfaction. In general, the analysis shows a marked indifference toward environmental issues, in fact, some indicators such as illegal building development, urbanization in protected areas, the levels of CO₂ emissions and the diffusion of green zones in urban areas are completely dissociated from the subjective perception of well-being.

Table 4 – *Correlation test results ordered for correlation coefficient and significance (P value).*

<i>Variables</i>	<i>Correlation coefficient</i>	<i>p value</i>	<i>Variables</i>	<i>Correlation coefficient</i>	<i>p value</i>
NEET	- 0.871	**	Recycling	0.531	*
General level of trust	0.847	**	Graduates	0.521	*
Trust in local government	0.844	**	Satisfaction with friendships	0.518	*
People at risk of poverty	- 0.840	**	Expenditure on cultural activities	0.513	*
Book readers	0.834	**	Religiosity	- 0.479	*
Employment rate	0.830	**	Psychological health	0.452	*
Activism	0.829	**	Electricity consumption from renewable sources	0.452	*
Voluntary work	0.824	**	Perceived crime risk	-0.394	
GDP (per capita)	0.804	**	Urbanization in protected areas	-0.364	
Newspaper readers	0.803	**	Trust in Parliament	-0.350	
Childhood mortality rate	- 0.736	**	Voters	0.195	
Public expenditure on heritage conservation	0.714	**	CO ₂ emissions	0.182	
Satisfaction with family relations	0.713	**	Sexual assault rate	0.093	
Physical health	0.702	**	Cultural heritage	0.085	
Illegal building development	0.691	**	Green zones in urban areas	0.035	
Income (per capita)	0.658	**	Trust in political parties	-0.001	
Percentage of employed in irregular work	- 0.654	**	Areas of outstanding natural beauty	-0.049	
Life expectancy	0.657	*	Contaminated areas	-0.199	
Perception of personal safety	0.625	*	Population density	-0.247	
Strong network of friends	-0.562	**	Murder rate	-0.336	

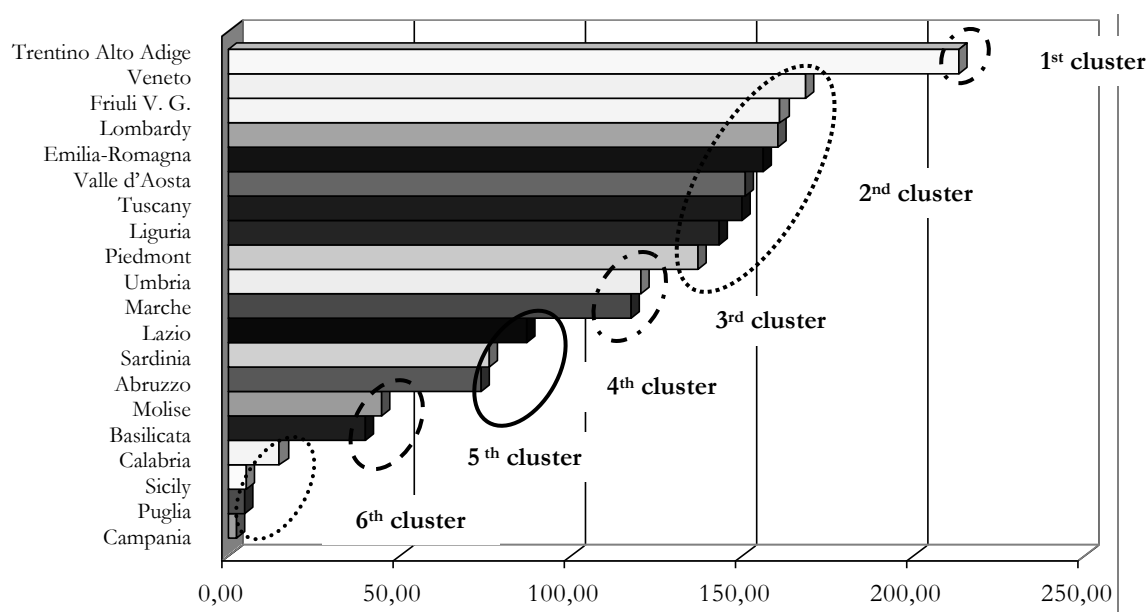
Source: own elaboration

*Post correlation analysis*¹⁴ – The geographical distribution of the subjective well-being was observed following the correlation test.

In particular, for each positively and significantly correlated indicator the relative position calculated in the pre-correlation analysis was multiplied by the correlation coefficient (Pearson coefficient), these weighted positions were then summed to estimate the distribution¹⁵ of subjective well-being in Italy (Picture 3).

The regions with the highest and lowest levels of reported well-being (respectively Trentino Alto Adige, Veneto, Friuli Venezia Giulia, Lombardy, Emilia-Romagna and Calabria, Sicily, Puglia and Campania) coincide, with the exception of Veneto, with the regions with the highest and lowest levels of objective well-being. The other ten regions show slight deviations between the first and the second “geography of well-being observation”.

At first sight, it may seem that the correlation test failed to achieve any cut-off function between the determination of objective and subjective well-being. However, a more accurate observation of the post correlation results evidences that, with the exception of Trentino, the distribution of subjective well-being is fragmented in a greater number of clusters. No less than eight regions form a second cluster (Veneto, Friuli Venezia Giulia, Lombardy, Emilia-Romagna, Valle d’Aosta, Tuscany, Liguria and Piedmont) and have a highly similar level of subjective well-being. The third cluster, comprising Umbria and Marche, is characterised by medium to high levels of well-being; the fourth cluster (Lazio, Sardinia and Abruzzi) shows medium levels of well-being while the citizens of the last two clusters (the fifth and sixth), consisting of Molise together with Basilicata and Calabria, Sicily, Puglia and Campania, perceive a substantial absence of well-being.



Picture 3 – *Geography of perceived subjective well-being.*

Source: own elaboration of data from ISTAT

A number of observations emerge from a comparison between the geographies of objective and subjective well-being: the pre-correlation analysis showed a wide gap between the Northern and Southern regions and a moderate fragmentation in groups. In the post-correlation analysis, the geography of well-being seems to be further fragmented and characterized by a smaller interregional gap. These results imply that the correlation between the life domain indicator and the regional levels of life satisfaction had the expected effects, enabling us to determine the regional levels of effectively perceived well-being which are different from those objectively measurable by a simple sum of “relative positions”.

The analysis makes it possible to observe graphically the position of each region in each correlation test. In other words, it is possible to understand how each indicator is perceived as more or less crucial in determining the levels of subjective perceived well-being in comparison with the other regions and the national average.

Conclusions – Despite a recent flourishing of empirical literature concerning well-being and the problems related to its measurement, there is still no method for quantifying and comparing its levels that is fully accepted by the international scientific community, by policy makers and by stakeholders. This study has attempted to tackle this methodological challenge by first determining the geography of objective well-being, inevitably by linear correlation, and then identifying the indicators that “express” perceived well-being. The relative positions to each life domain were then “weighted” with the correlation coefficient in order to obtain a measure of perceived subjective well-being and to permit a comparison between the levels of well-being in the different regions.

The analysis proposed here is one of the few within-country interregional comparisons to be undertaken so far (Larson. 2010; Morrison. 2011). In fact, the empirical studies hitherto made adopted either a country-level scale (Veenhoven. 1993; Veenhoven. 1995; Diener *et al.*. 1995; Deaton. 2008); a metropolitan scale (Glaeser *et al.*. 2009; Florida *et al.*. 2013) or carried out the study at a district level (Baum *et al.*. 2010; Permentier *et al.*. 2011; Corrado *et al.*. 2013).

Moreover, the study could have significant policy implications. Each region shows its own degree of correlation between life satisfaction and the life domain indicators that should be properly considered by policy makers when examining the reasons for the inefficiency of generalised, national actions and programs. Assessing the sensitivity of the regional population to each life domain could in fact better guide their policy choices to satisfy the population’s needs.

Despite the innovative character of the study, it does present a number of conceptual and methodological limitations. As mentioned previously, linear correlation does not allow us to identify the causal relationship between two variables: it is possible to assert that a given indicator is correlated with the level of life satisfaction (and vice versa), but we cannot say that the first is the cause of the second or exclude the reciprocity of the relationship.

A second methodological limitation is related to the phenomena of the so-called collinearity that distort the measurement of the actual correlation of each variable with the level of life satisfaction, i.e. life indicators belonging to the same domain (such as GDP per capita, average income per capita and employment rates) are in fact plausibly correlated.

A further limitation is the static nature of the analysis: a longitudinal study would have allowed both dynamic and static observation of the individual indicators affecting the perception of well-being.

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Notes

- ¹ Life domain refers to an aspect of daily life that is significant in terms of well-being that can be measured by a number of different indicators.
- ² For statistical and cartographic details, see the Appendix, visible in the electronic format of the article.
- ³ The environment as a life domain is analysed in the next section.
- ⁴ Irregular workers are those in employment that work without complying with tax regulations or receiving contributions.
- ⁵ For further statistical details, please refer to Tab. 1 of the Appendix, visible in the electronic format of the article.
- ⁶ The activities measured by this indicator are attendance at meetings of associations (cultural, recreational, environmentalist, peace and civil rights), trade unions and political parties, professional associations or membership in societies and sports clubs.
- ⁷ For more details visit the website: www.misuredelbenessere.it
- ⁸ The value was obtained by summing the relative positions in the "weighted" ranking for significantly correlated indicators with the value of the Pearson correlation coefficient
- ⁹ The correlation, however, does not allow us to define the causal relationship between two variables that can also be demonstrated using regression tools that, despite the pioneering studies of Florida *et al.* (2012), are not yet sufficiently widespread
- ¹⁰ The Pearson correlation coefficient is statistically defined as the ratio of covariance of the two variables and the product of their standard deviations ($\sigma_{xy} = \rho_{xy} / \sigma_x \sigma_y$).
- ¹¹ The *p-value* is a measure of evidence against the null hypothesis (See Bohrnstedt e Knoke. 1998).
- ¹² Instead of correlating the average value of regional satisfaction we preferred to carry out the tests between each indicator and the percentage of the population surveyed claiming to be satisfied (score ≥ 7).
- ¹³ In particular, the last survey of the index for psychological state dates back to 2005 while the data for life expectancy and good health are available for the year 2011.
- ¹⁴ The results are presented in detail in the Appendix, visible in the electronic format of the article.
- ¹⁵ Indicators with a weak and/or non-significant correlation with the level of satisfaction were not taken into account for the determination of subjective well-being.

APPENDIX

Statistical definition of each indicator for the life domains.

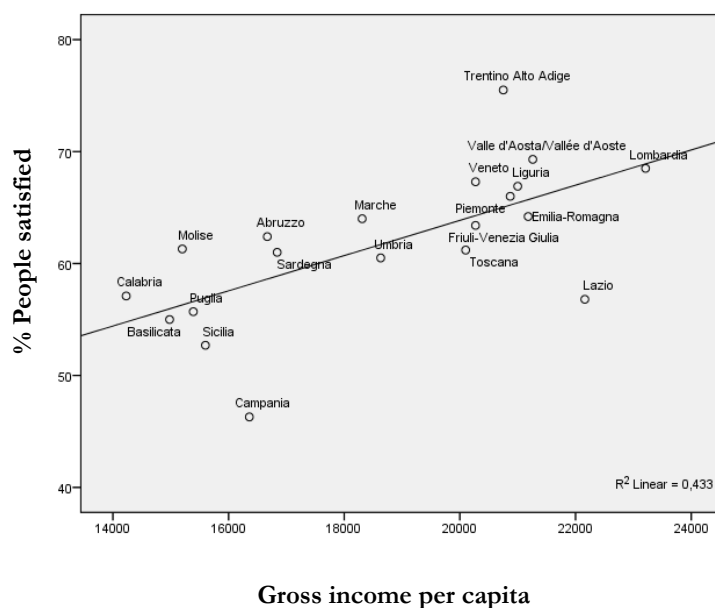
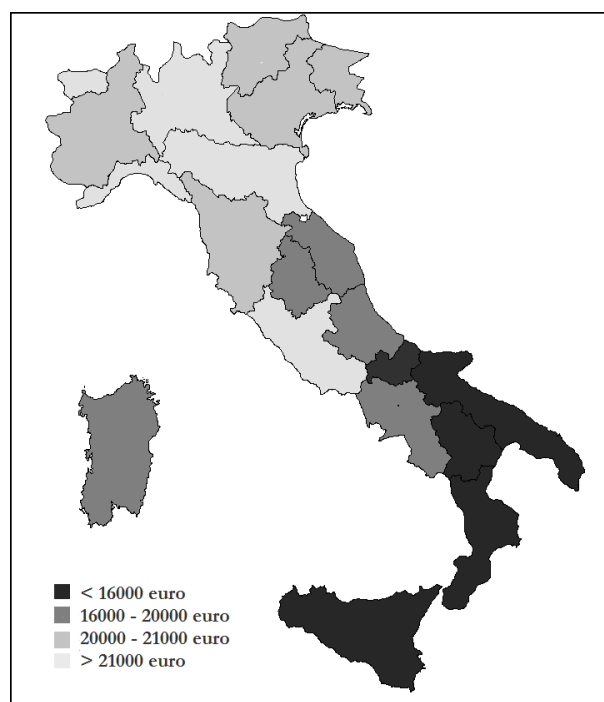
Tab. 1 – Definition of the indicators used for the life domains.

Indicator	Statistical definition of each indicator
<i>Wealth</i>	
Income (per capita)	Ratio between disposable income and the number of residents
GDP (per capita)	Per capita value of production activities of goods and services
Employment rate	Percentage of employed persons between 20 and 64 years
Percentage of employed in irregular work	Percentage of non-regular employees on total of people employed
People at risk of poverty	Percentage of people (out of number of residents) with an income of less than or equal to 60% of mean income
NEET (Not engaged in Education, Employment or Training) rate	Percentage of young people (15-29 years) NEET
<i>Culture and Education</i>	
Graduates	Percentage of people aged between 30 and 34 years old who have completed a university degree
Newspaper readers	Percentage of people (≥ 6 years) who read newspapers at least once a week
Book readers	Percentage of people (≥ 6 years) who have read at least one book in the 12 months preceding the survey
Expenditure on cultural activities	Percentage of total consumption spent on culture and leisure activities (per household)
<i>Social relations</i>	
Satisfaction with family relations	Percentage of people (≥ 14 years) very satisfied with family relationships
Satisfaction with friendships	Percentage of people (≥ 14 years) very satisfied with friendships
Activism	Percentage of people (≥ 14 years) that, in the 12 months preceding the survey, have taken part in at least one social activity
Voluntary work	Percentage of people (≥ 14 years) that, in the 12 months preceding the survey, have taken part in at least one instance of voluntary work
Religiosity	Percentage of people (≥ 6 years) who attend places of worship one or more times per week
Strong network of friends	Percentage of people (≥ 6 years) who meet friends daily
<i>Civiness and community</i>	
Perception of personal safety	Percentage of people (≥ 14 years) who feel safe walking alone in the dark in the area where they live
General level of trust	Percentage of people (≥ 14 years) who believes that most people are trustworthy
Trust in local government	Percentage of people (≥ 14 years) who trust in local institutions (score ≥ 7 on a scale from 0 to 10)
Trust in Parliament	Percentage of people (≥ 14 years) who have faith in the Italian Parliament (score ≥ 7 on a scale from 0 to 10)
Sexual assault rate	Percentage of women (aged 16 to 70 years) who have been victims of sexual violence in the 12 months preceding the survey
Perceived crime risk	Percentage of people (≥ 14 years) that, in the 12 months preceding the survey, feared becoming victim of a criminal offence
Voters	Percentage of voters in the last election of the European Parliament (out of the total of those eligible)
Trust in political parties	Percentage of people (≥ 14 years) who trust in political parties (score ≥ 7 on a scale from 0 to 10)
Murder rate	Murders out of the total population * 100,000
<i>Physical and psychological health</i>	
Psychological health	Average of the scores aggregated by each individual (≥ 14 years) in answer to the 12 questions of the questionnaire performed by ISTAT
Life expectancy	Average number of years that a child at birth can expect to live
Physical health	Percentage of people (≥ 14 years) who report that they feel well or very well

Childhood mortality rate ^o	Deaths in the first year of life per 10,000 live births
<i>Environmental quality</i>	
Illegal building development	Number of buildings built illegally per 100 duly authorized constructions
Public expenditure on heritage conservation	Current municipal public expenditure per capita intended for the management of cultural heritage
Recycling	Percentage of municipalities that perform separate collection of municipal solid waste
Electricity consumption from renewable sources	Percentage of consumption covered by renewable sources
CO ₂ emissions	Tonnes of CO ₂ equivalent per person
Urbanization in protected areas	Number of buildings per 100 km ² in the areas referred to in Legislative Decree no. 42/2004 (Art. 142. para. a). d). l))
Cultural heritage	Number of archaeological and architectural heritage sites and museums surveyed in the "Risk Map of Cultural Heritage" per 100 km ²
Green zones in urban areas	Square metres of green space per inhabitant
Areas of outstanding natural beauty	Proportion of areas included in the "Rete Natura 2000" on the total surface area of the territory
Contaminated areas	Extent in hectares of contaminated sites of national interest
Population density	Inhabitants per km ²

Source: own elaboration of data from CRESME Research centre, ISTAT (Italy's National Statistics Institute), The Italian Ministry of the Environment and Protection of Land and Sea of Italy and Italian Ministry of Interior

Wealth



Pic. 1 – *Gross income per capita: geographical differences and correlation with the life satisfaction indicator*
 Source: own elaboration of data from ISTAT

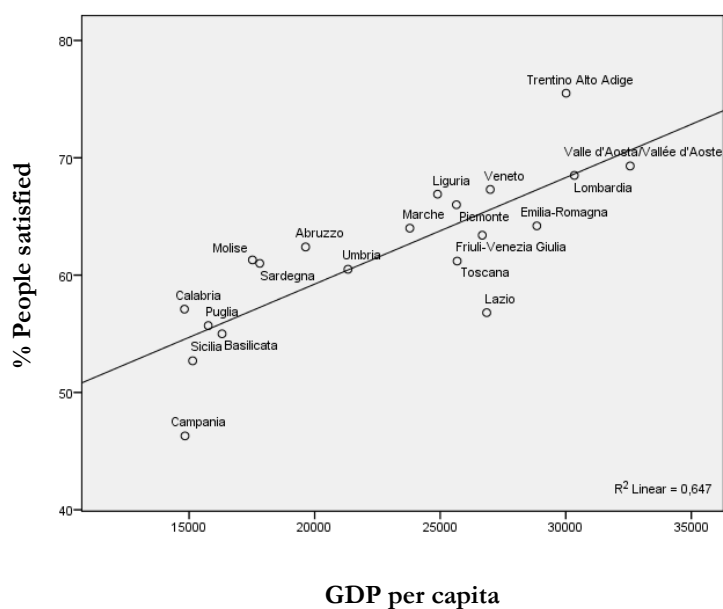
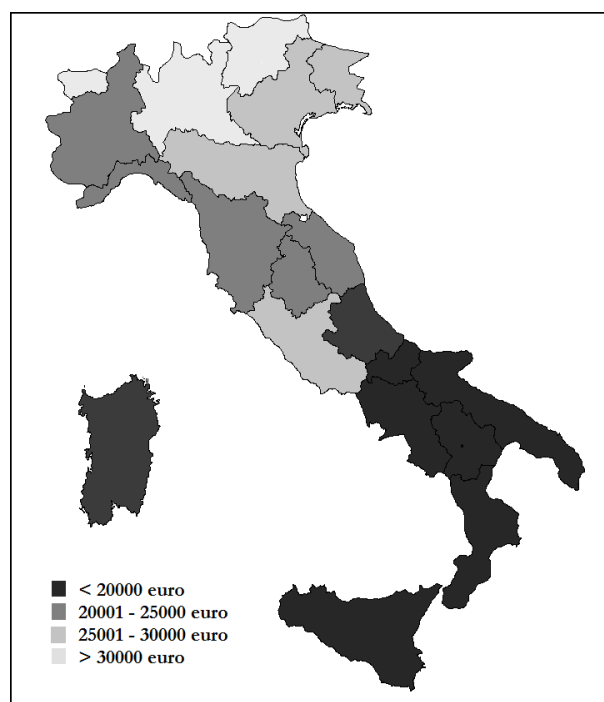
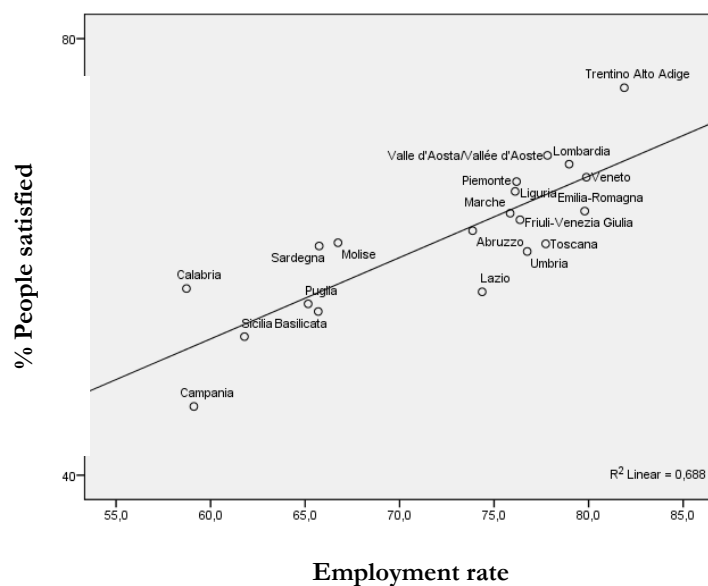
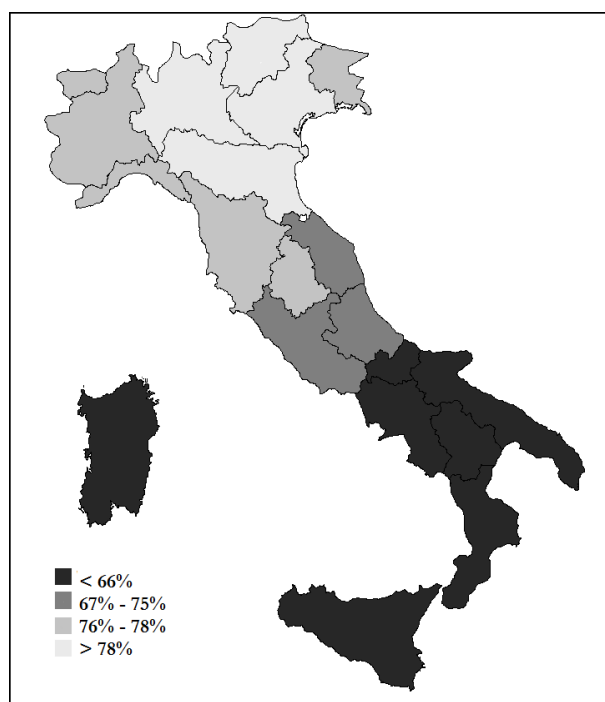
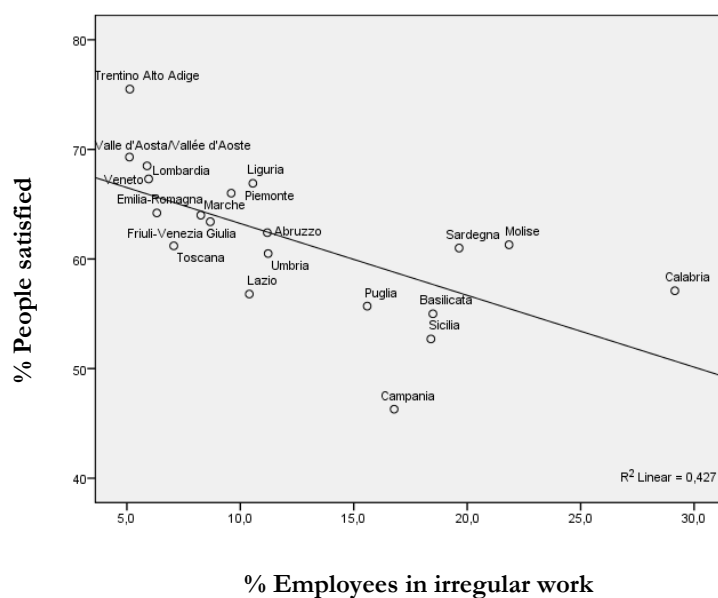
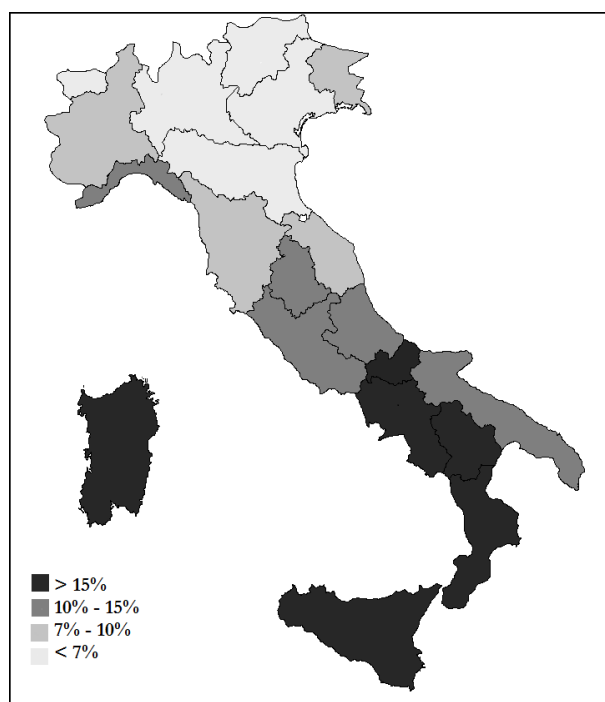


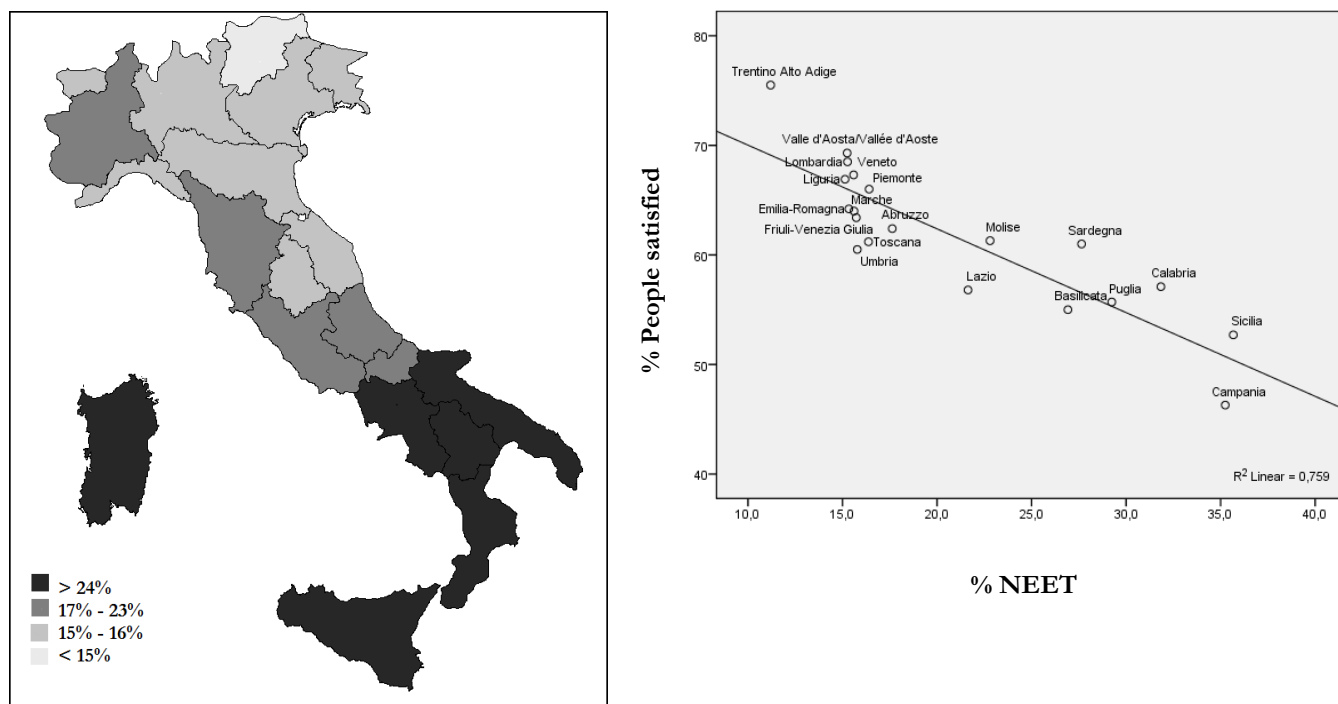
Fig. 2 – *GDP per capita: geographical differences and correlation with the life satisfaction indicator*
 Source: own elaboration of data from ISTAT



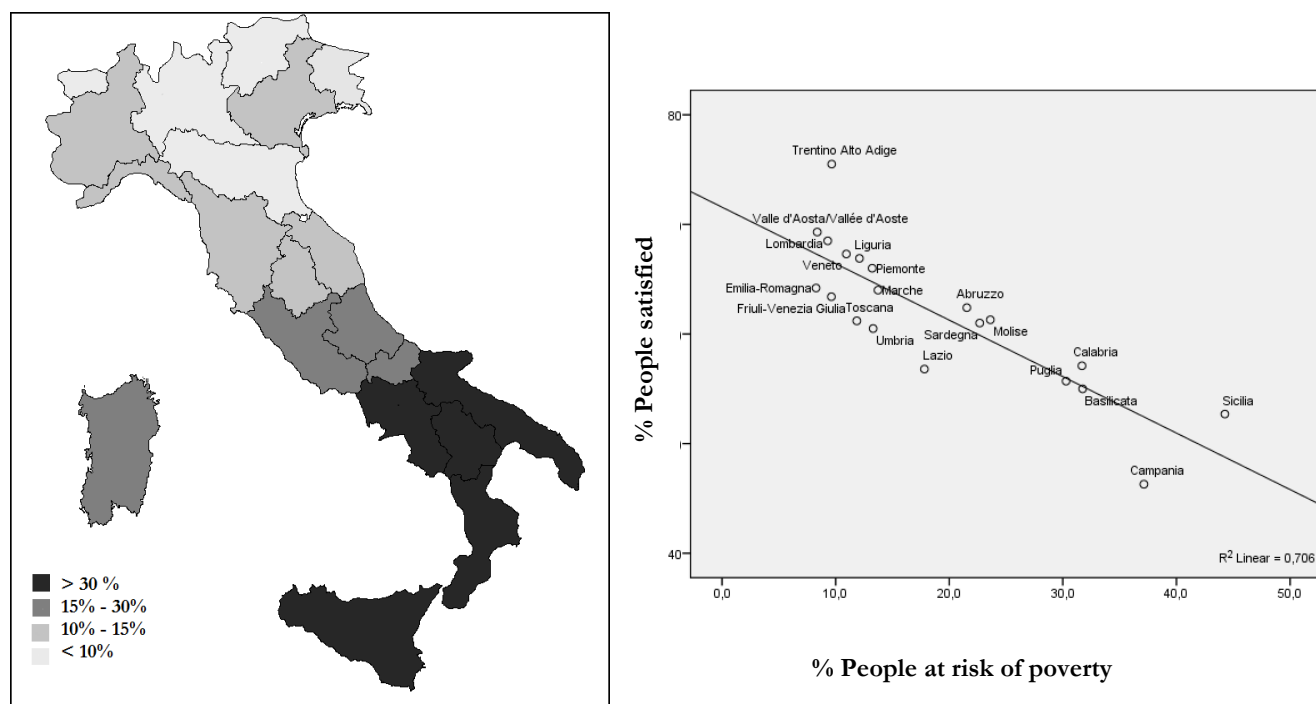
Pic. 3 – *Employment rate: geographical differences and correlation with the life satisfaction indicator*
 Source: own elaboration of data from ISTAT



Pic. 4 – *Percentage of employed in irregular work: geographical differences and correlation with the life satisfaction indicator*
 Source: own elaboration of data from ISTAT

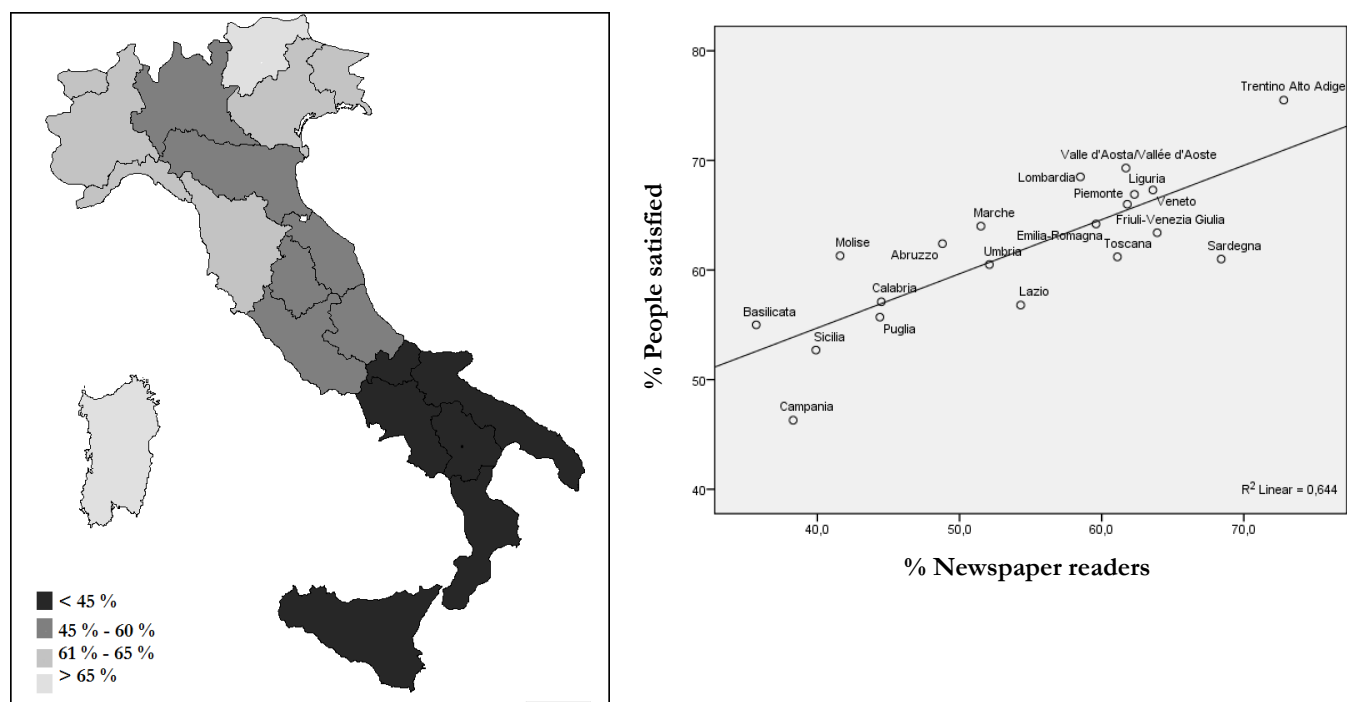


Pic. 5 – NEET rate: geographical differences and correlation with the life satisfaction indicator
 Source: own elaboration of data from ISTAT

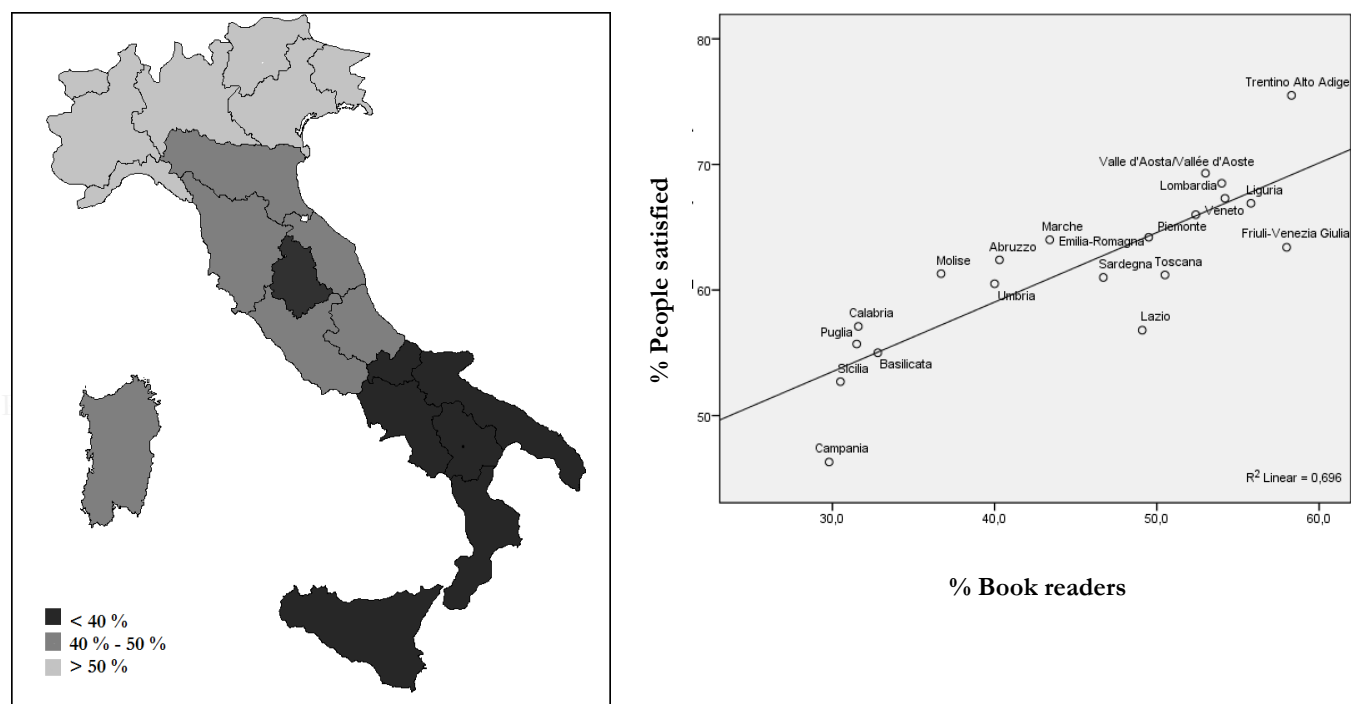


Pic. 6 – Percentage of people at risk of poverty: geographical differences and correlation with the life satisfaction indicator
 Source: own elaboration of data from ISTAT

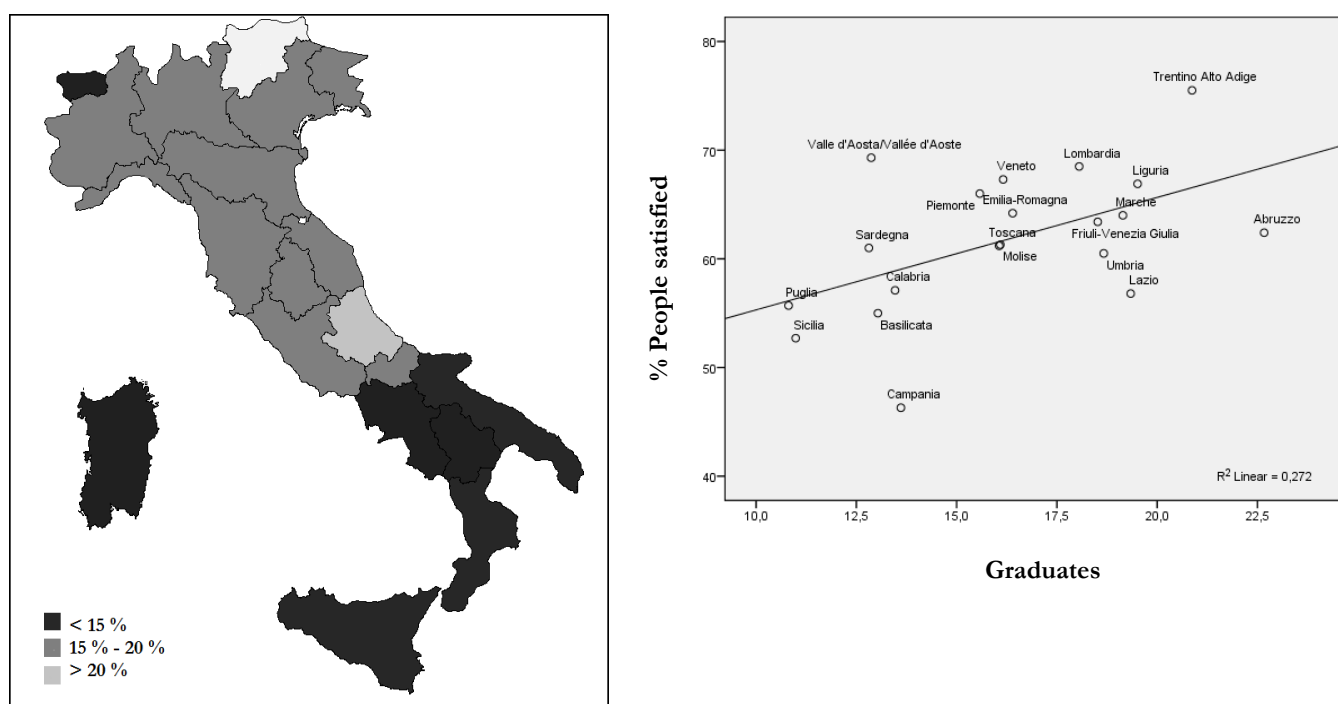
Culture and education



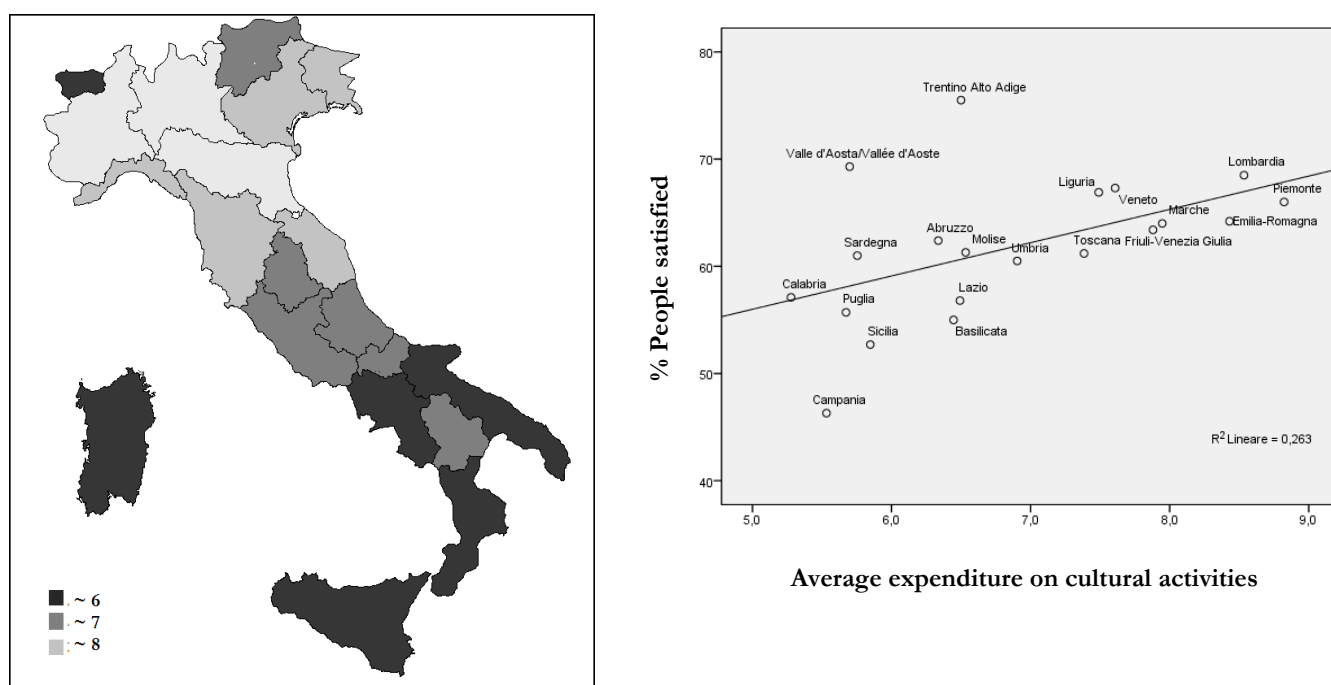
Pic. 7 – *Percentage of newspaper readers: geographical differences and correlation with the life satisfaction indicator*
 Source: own elaboration of data from ISTAT



Pic. 8 – *Percentage of book readers: geographical differences and correlation with the life satisfaction indicator*
 Source: own elaboration of data from ISTAT

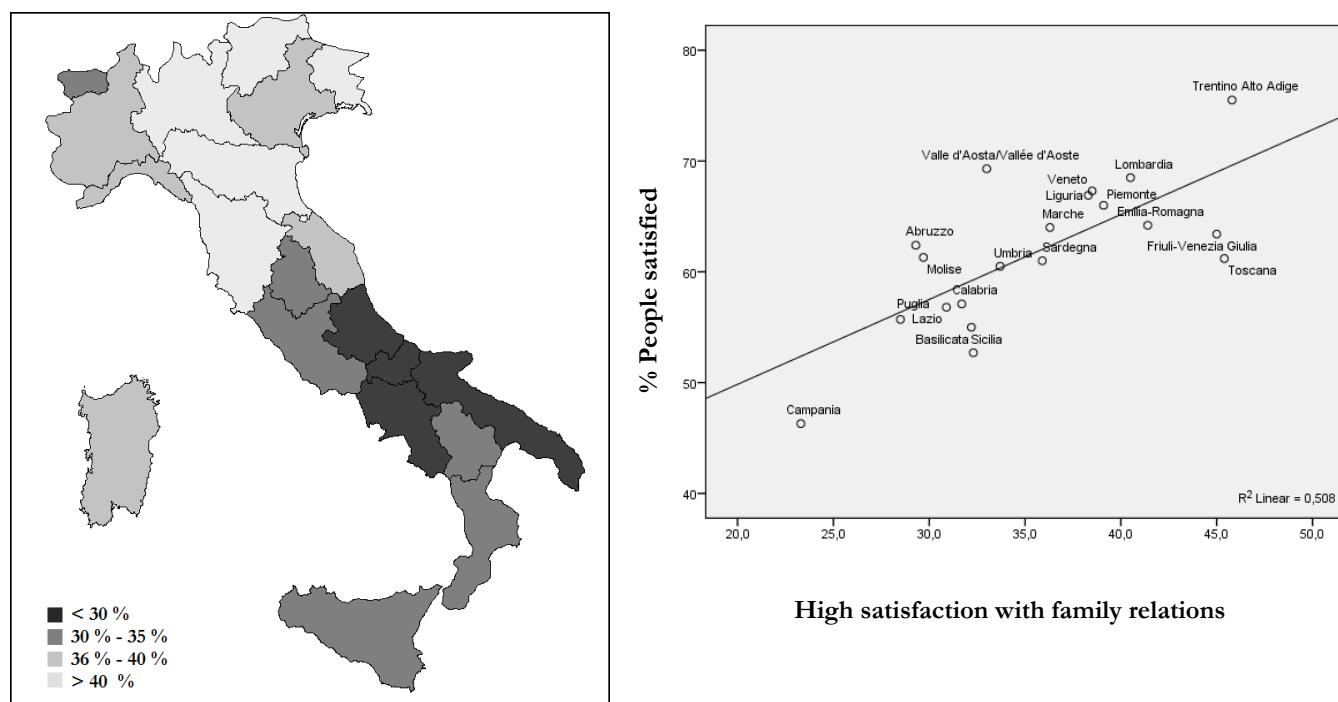


Pic. 9 – *Percentage of graduates: geographical differences and correlation with the life satisfaction indicator*
 Source: own elaboration of data from ISTAT



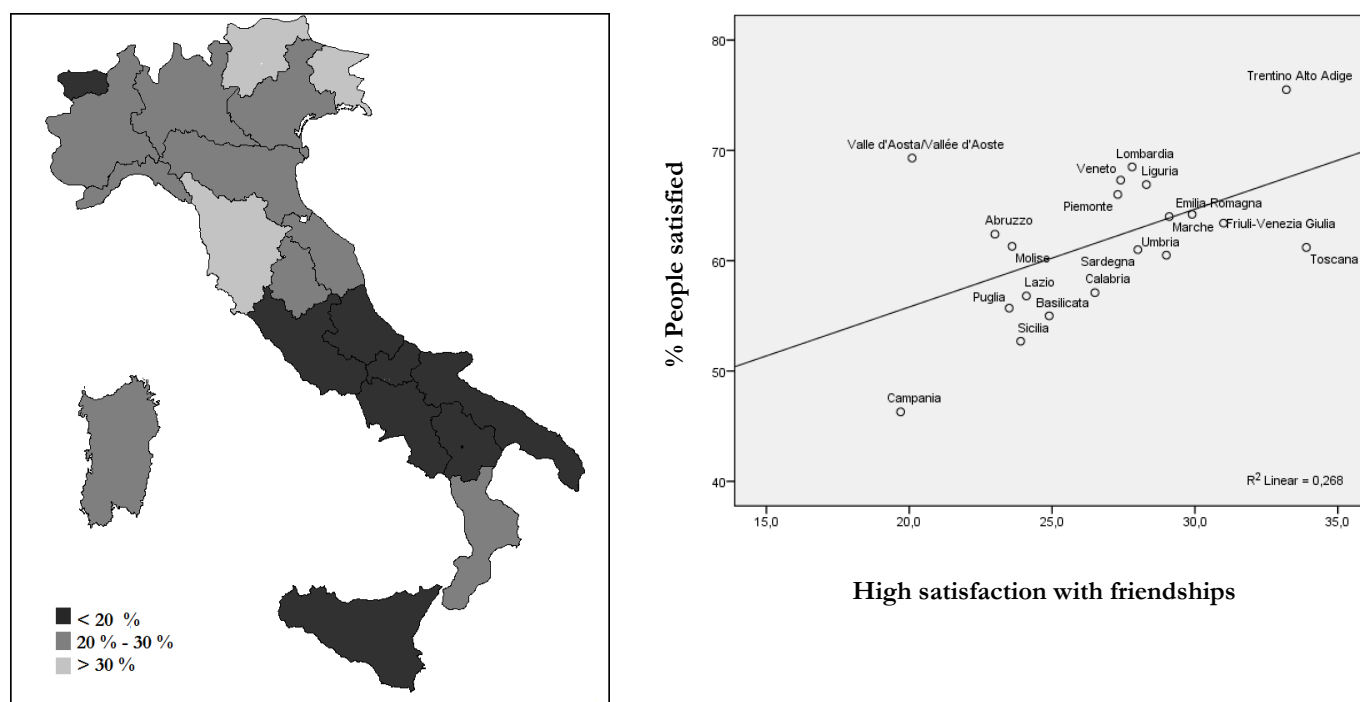
Pic. 10 – *Average expenditure on cultural activities: geographical differences and correlation with the life satisfaction indicator*
 Source: own elaboration of data from ISTAT

Social relations



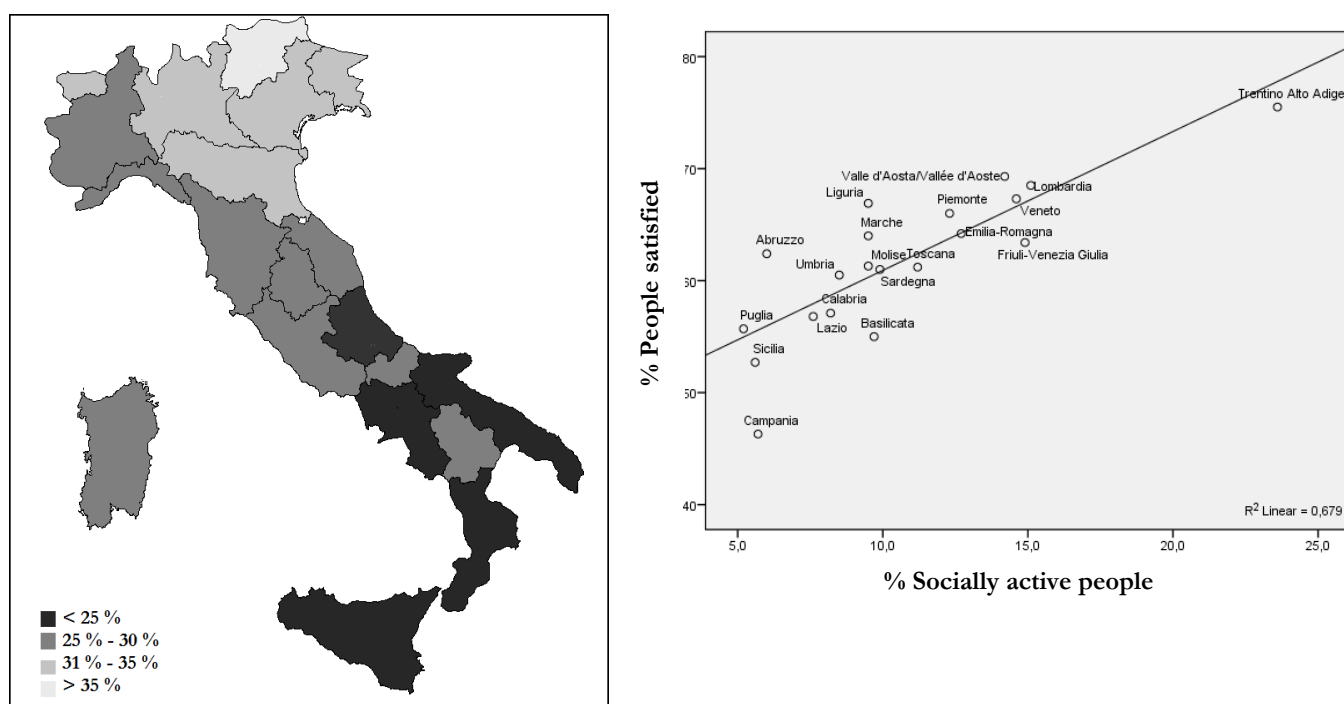
Pic. 11 – Percentage of people very satisfied with family relations: geographical differences and correlation with the life satisfaction indicator

Source: own elaboration of data from ISTAT

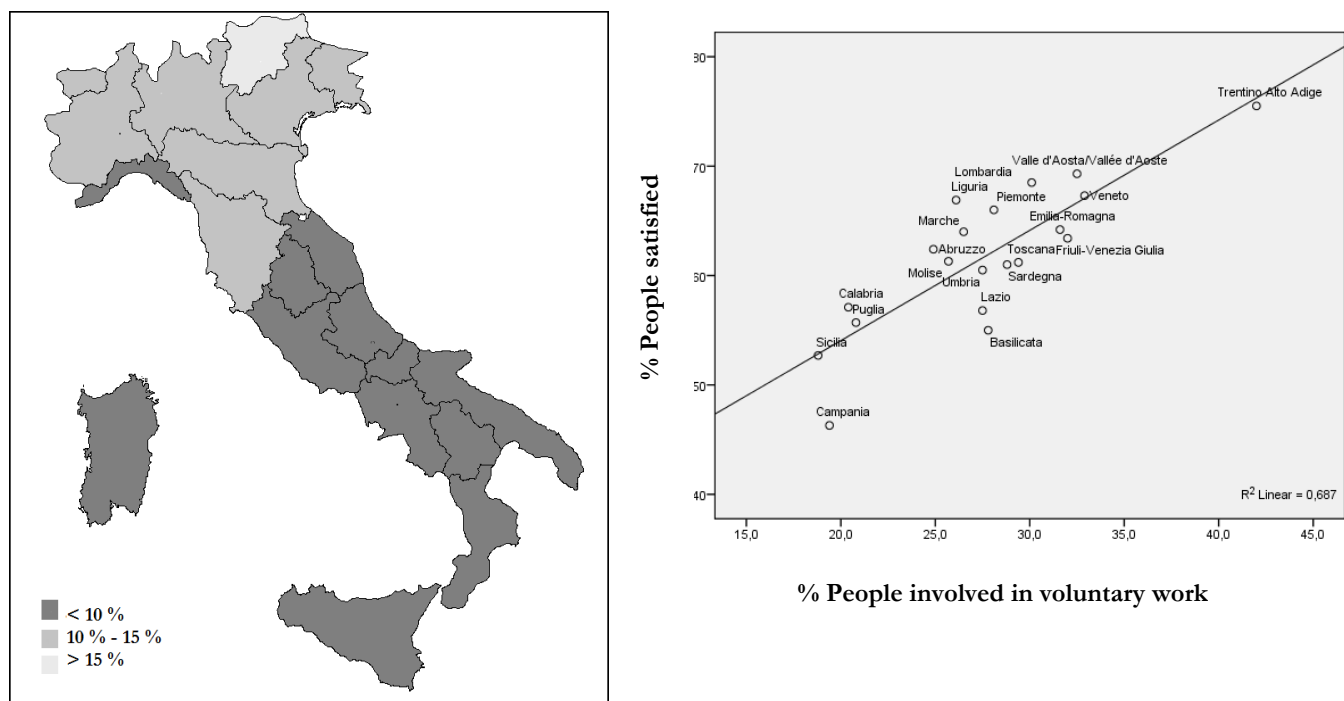


Pic. 12 – Percentage of people very satisfied with friendships: geographical differences and correlation with the life satisfaction indicator

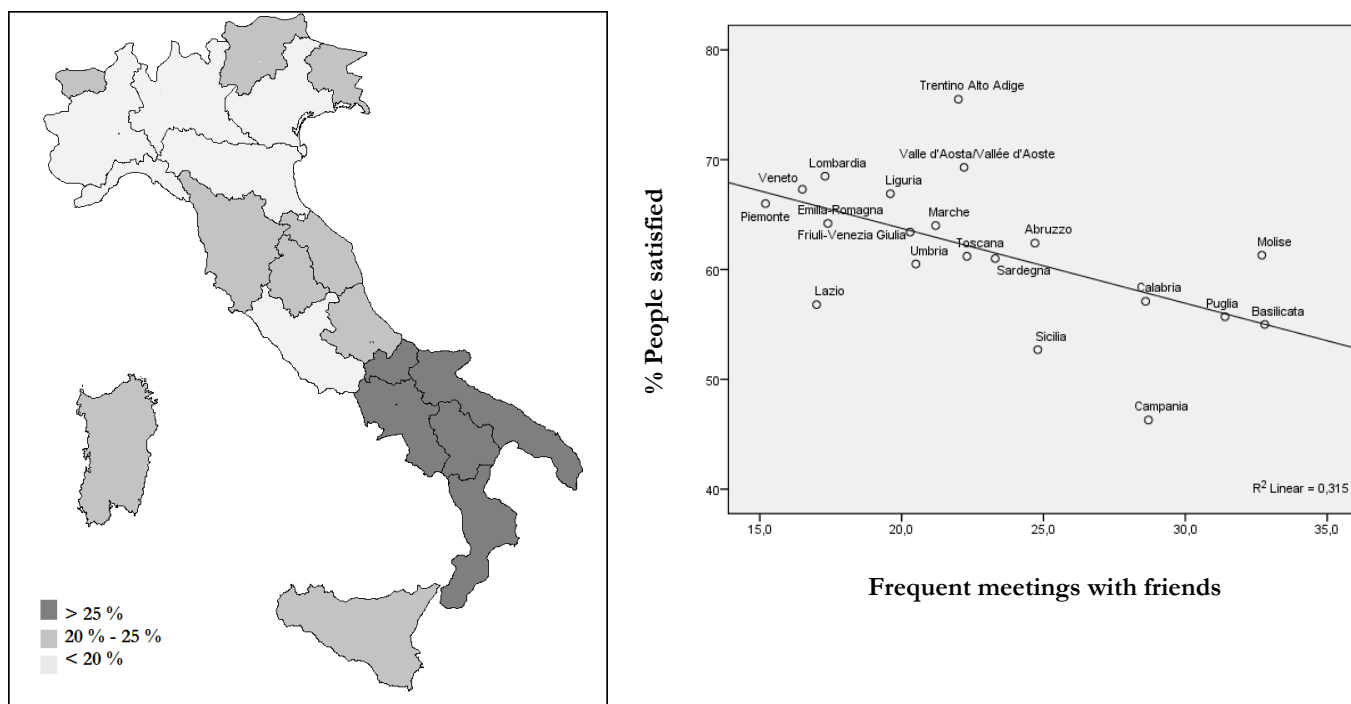
Source: own elaboration of data from ISTAT



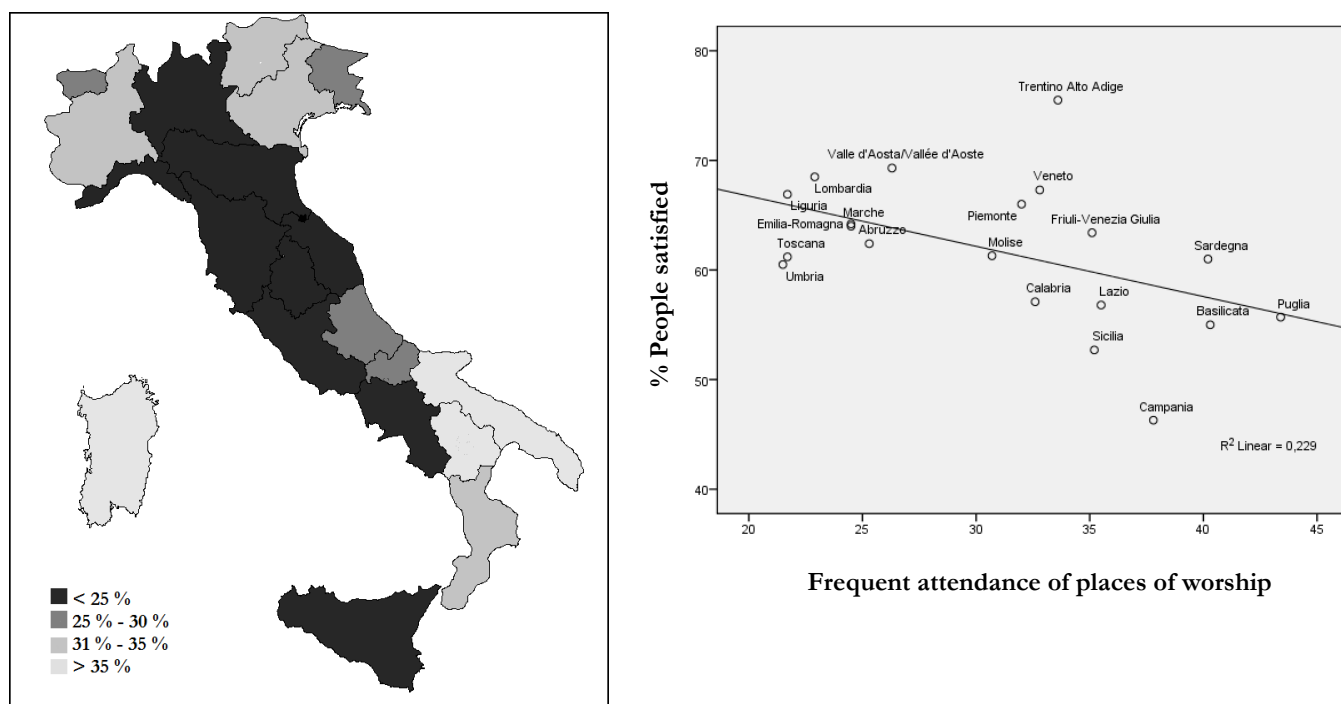
Pic. 13 – *Percentage of socially active people: geographical differences and correlation with the life satisfaction indicator*
 Source: own elaboration of data from ISTAT



Pic. 14 – *Percentage of people involved in voluntary work: geographical differences and correlation with the life satisfaction indicator*
 Source: own elaboration of data from ISTAT

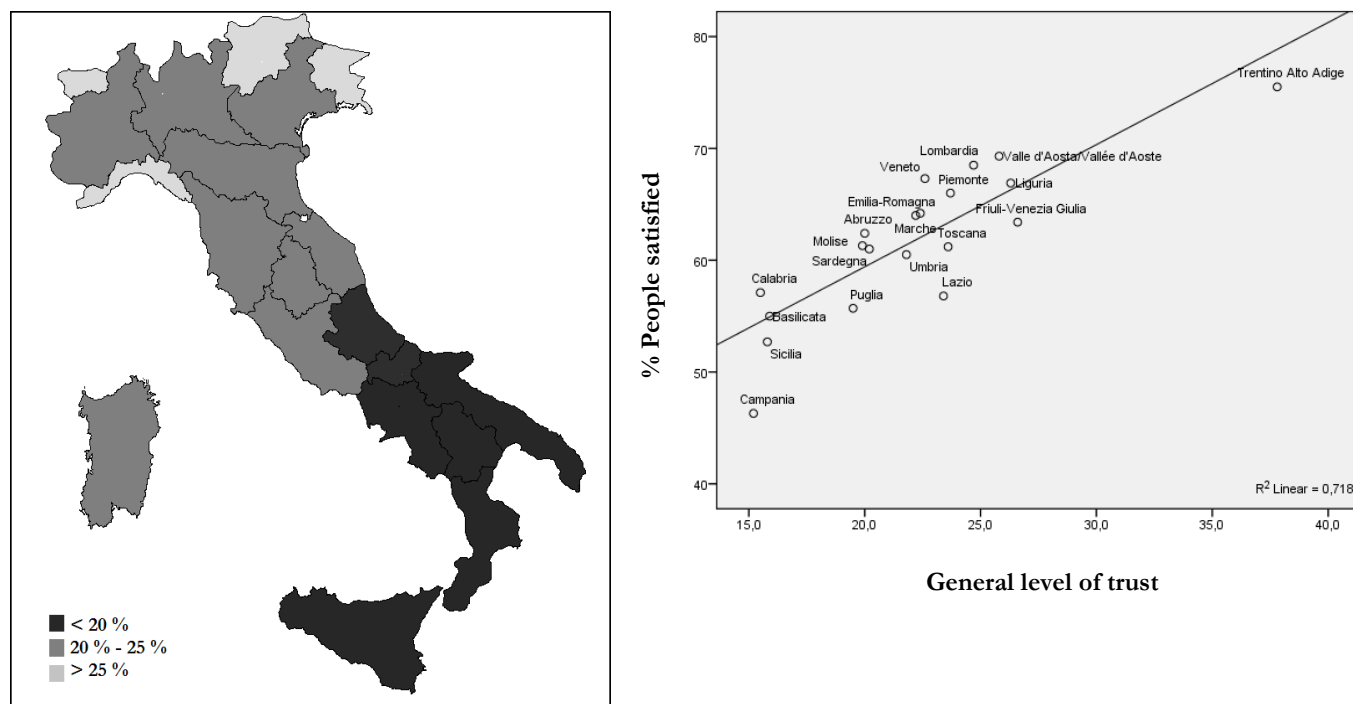


Pic. 15 – *Frequent meetings with friends: geographical differences and correlation with the life satisfaction indicator*
 Source: own elaboration of data from ISTAT

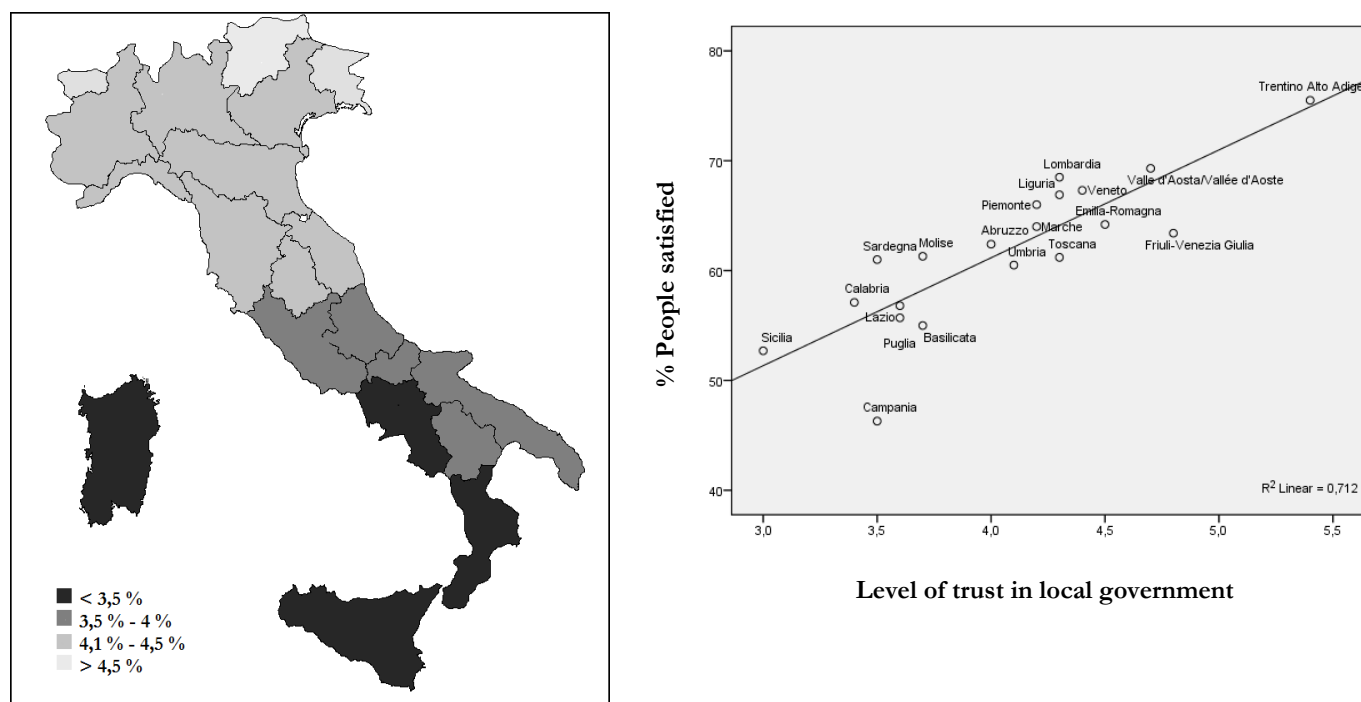


Pic. 16 – *Frequent attendance of places of worship: geographical differences and correlation with the life satisfaction indicator*
 Source: own elaboration of data from ISTAT

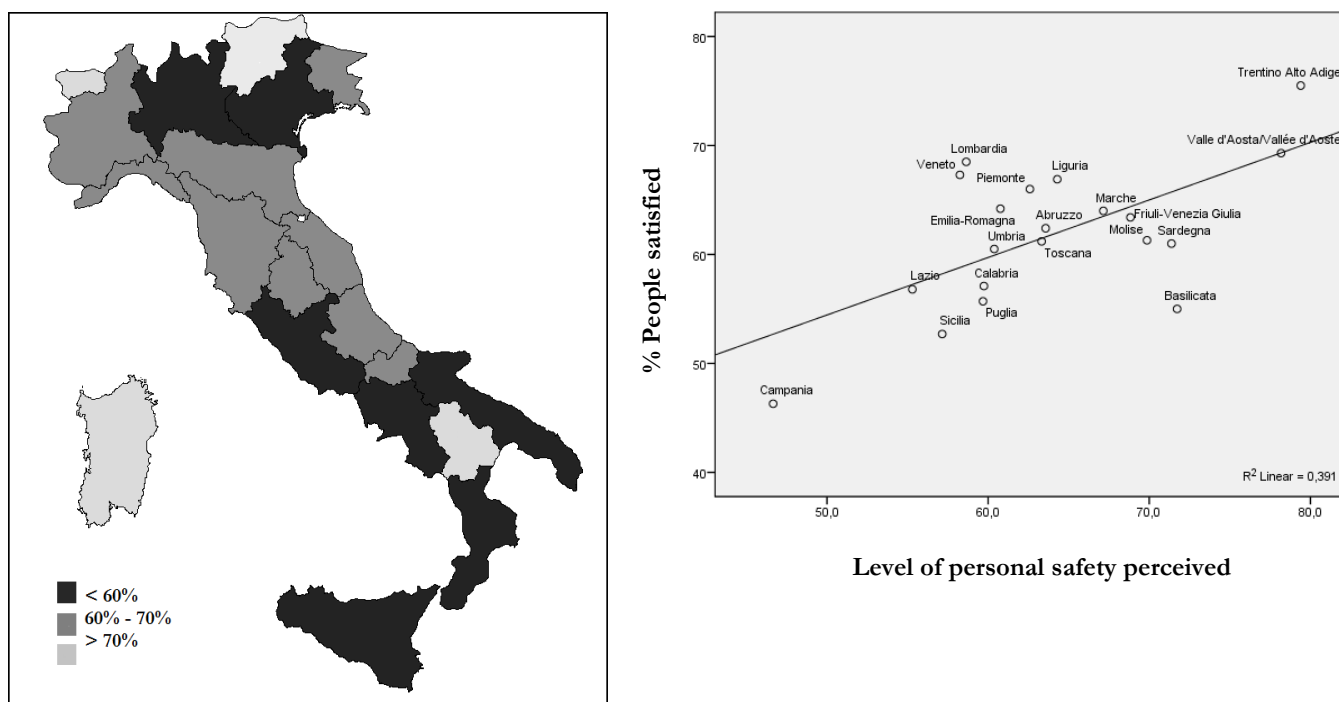
Civicness and community



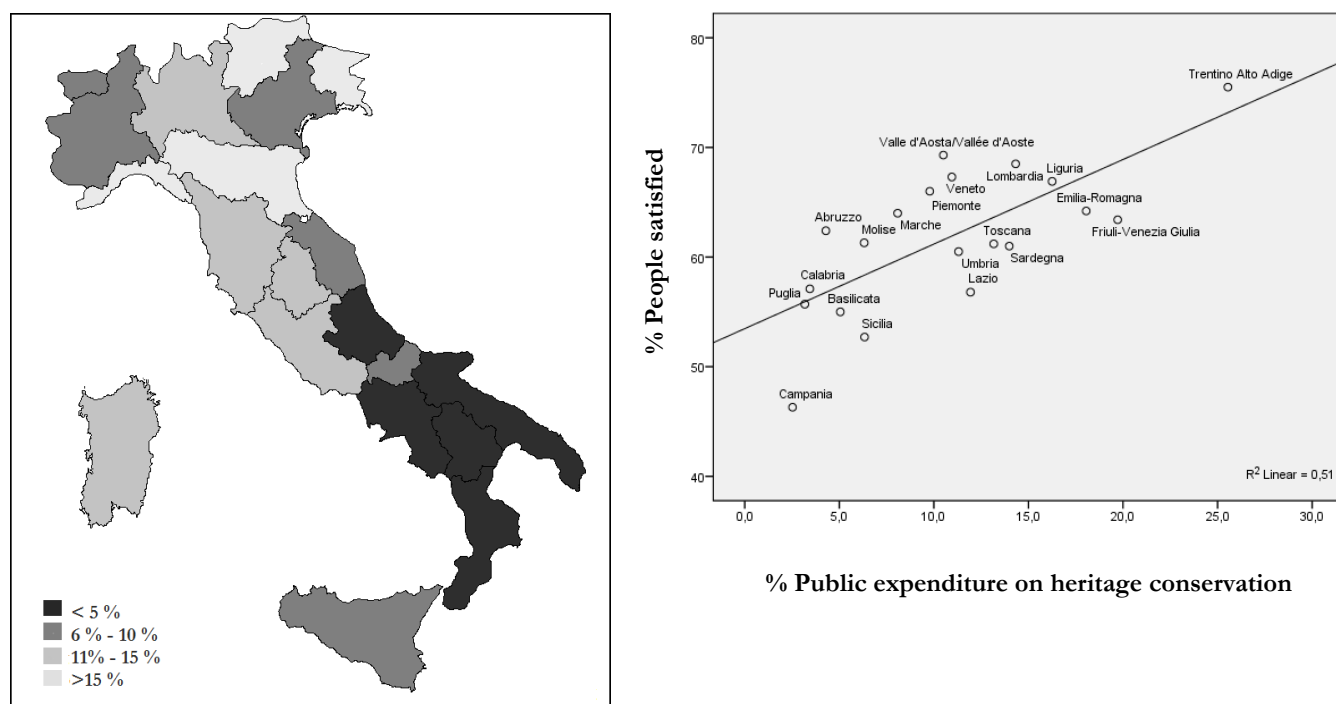
Pic. 17 – *General level of trust: geographical differences and correlation with the life satisfaction indicator*
 Source: own elaboration of data from ISTAT



Pic. 18 – *Level of trust in local government: geographical differences and correlation with the life satisfaction indicator*
 Source: own elaboration of data from ISTAT

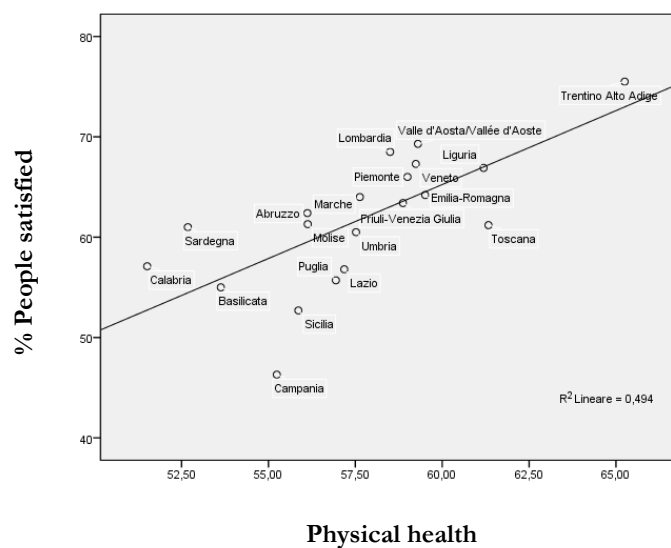
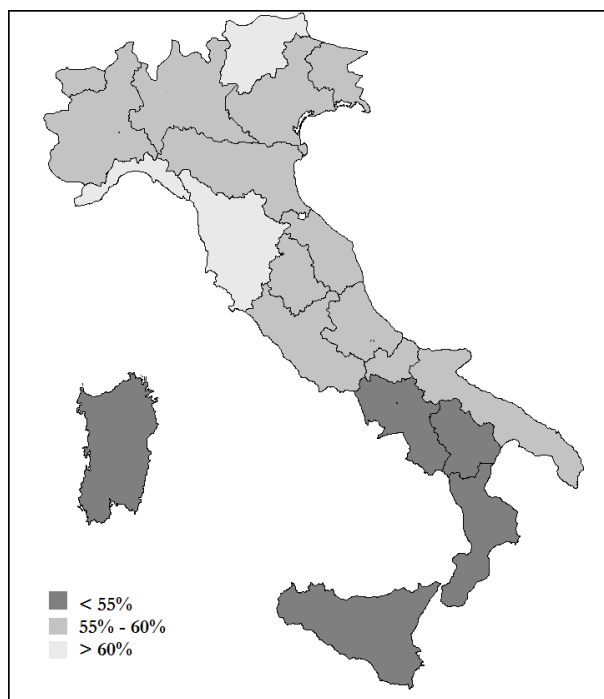


Pic. 19 – *Level of personal safety perceived: geographical differences and correlation with the life satisfaction indicator*
 Source: own elaboration of data from ISTAT



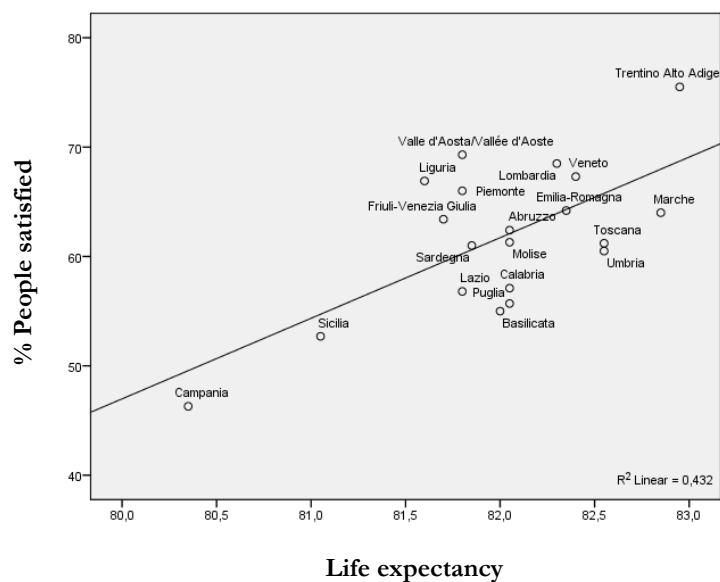
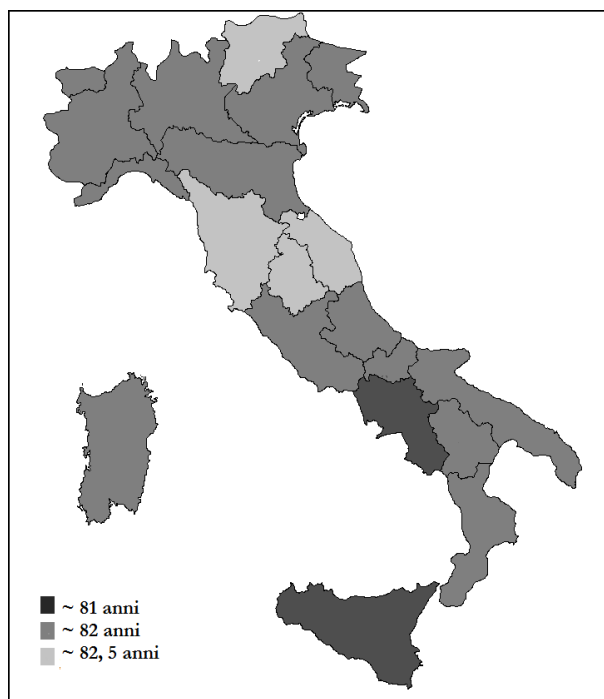
Pic. 20 – *Percentage of public expenditure on heritage conservation: geographical differences and correlation with the life satisfaction indicator*
 Source: own elaboration of data from ISTAT

Physical and psychological well-being



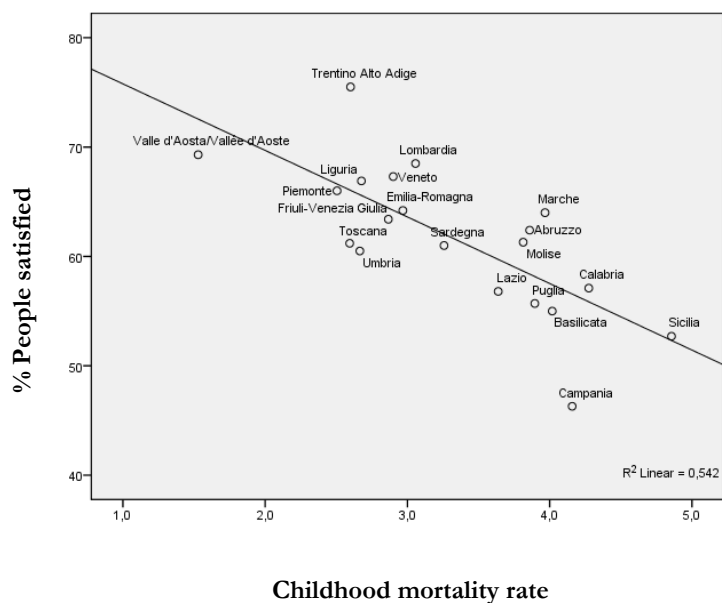
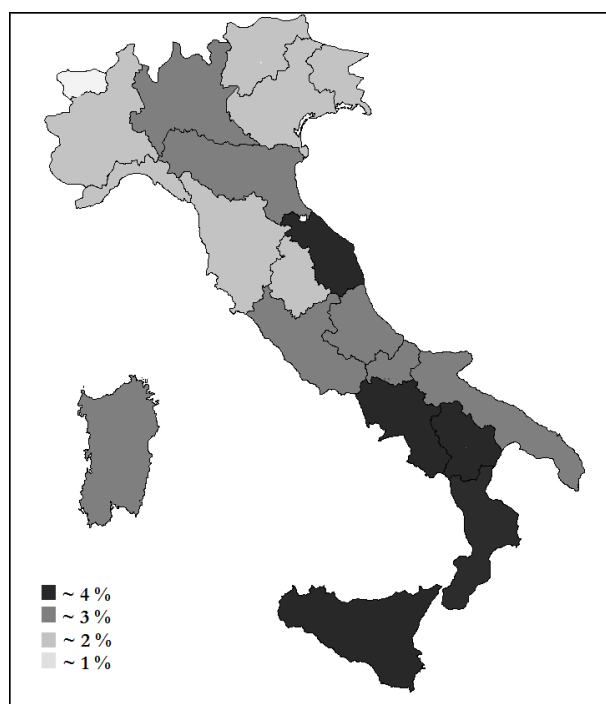
Pic. 21 –*Index of physical health: geographical differences and correlation with the life satisfaction indicator*

Source: own elaboration of data from ISTAT

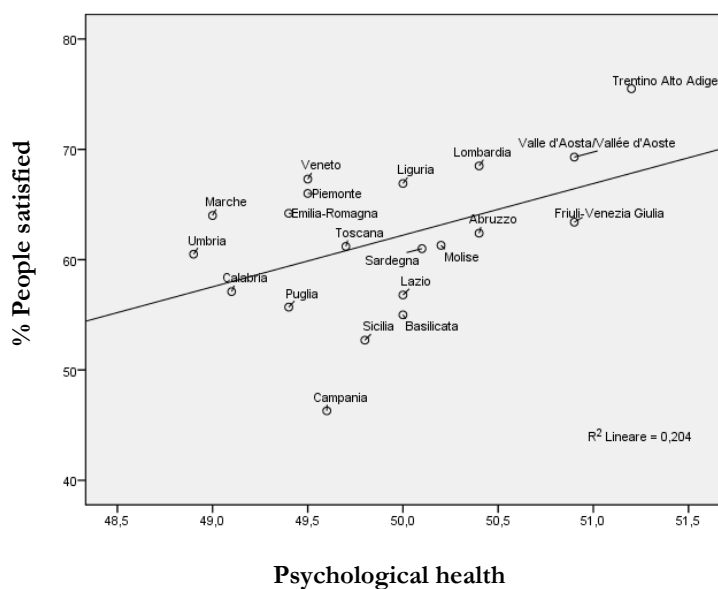
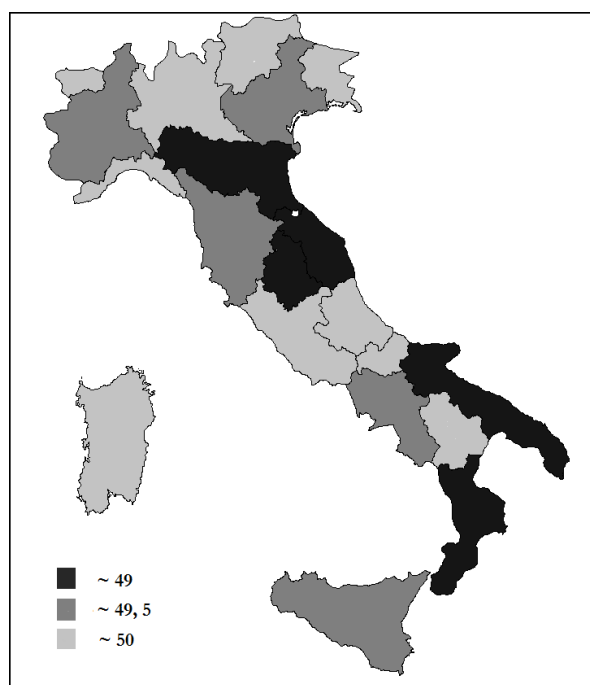


Pic. 22 –*Life expectancy: geographical differences and correlation with the life satisfaction indicator*

Source: own elaboration of data from ISTAT

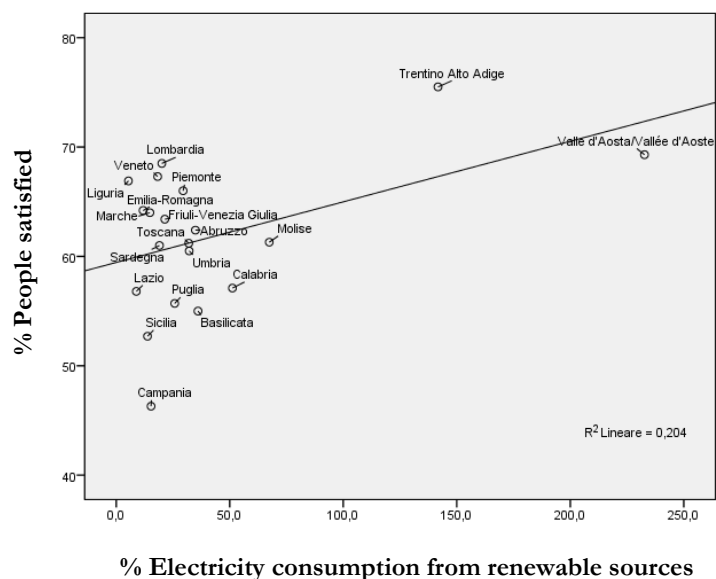
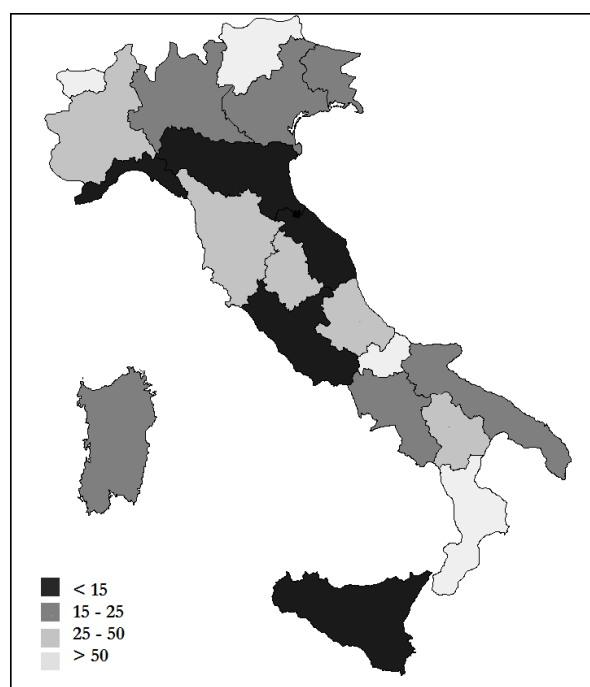


Pic. 23 – *Childhood mortality rate: geographical differences and correlation with the life satisfaction indicator*
 Source: own elaboration of data from ISTAT



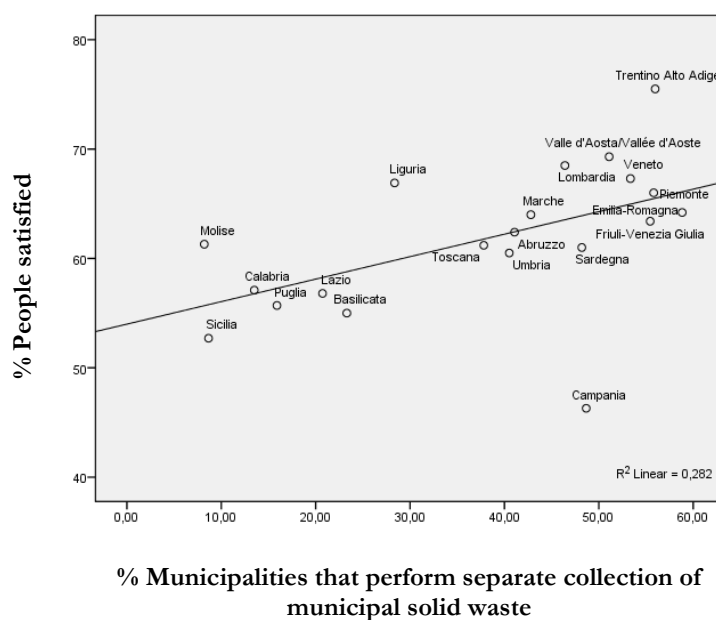
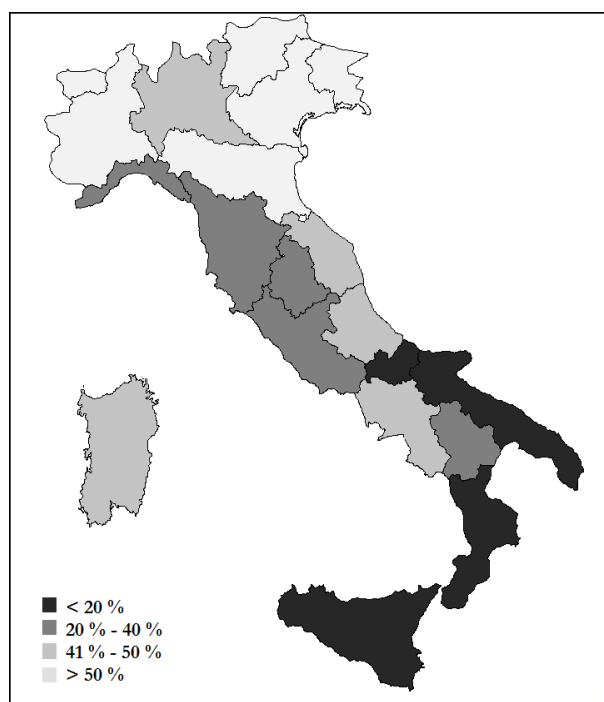
Pic. 24 – *Index of psychological health: geographical differences and correlation with the life satisfaction indicator*
 Source: own elaboration of data from ISTAT

Environmental quality



Pic. 25 –Percentage of electricity consumption from renewable sources: geographical differences and correlation with the life satisfaction indicator

Source: own elaboration of data from ISTAT



Pic. 26 – Percentage of municipalities that perform separate collection of municipal solid waste: geographical differences and correlation with the life satisfaction indicator

Source: own elaboration of data from ISTAT