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THINK GLOBAL, ACT LOCAL: RETHINKING MARKETING STRATEGIES TO ENHANCE ITALIAN AND MARCHES REGION WINE SECTOR. SOME EVIDENCES FROM A CONSUMER SCIENCE APPROACH

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# Introduction

This thesis is the result of the "Eureka" Doctoral project of research promoted by Marches Region and University of Macerata, that combines applied research activities to create value in entrepreneurial sectors of Marches Region. CIAS INNOVATION is the consulting company that take a part in the project. Its mission is to follow food and beverage companies in product innovation and in marketing strategy.

In this specific case, I focused my research in the wine sector supply chain to understand which marketing strategies could be implemented to make the regional wine sector more stable and competitive in Italian and global market.

Each chapter presents a case study; their multidisciplinary nature, from an academic research perspective offers an original point of view combining social, psychological and economic disciplines to better understand the stakeholder dynamics in the world of wine. For entrepreneurial context, the researches provide interesting implications for managerial decisions in wine sector and suggest methods and tools to the companies, that can be implemented in order to increase their competiveness.

Profound structural changes are underway in the wine sector, as an increasing number of large producers is progressively improving the global positioning of Italians and Marches Region wines in the international market.

The April 2016 report by the International Organization of Vine and Wine on the state of the viticulture world market (OIV, 2016) indicated that world wine

production reached 274.4 million hectolitres, an increase of 5.8 mhl over the amount produced in 2014. In particular, European wine production in 2015 exceeded that of 2014 by almost 6 mhl. Positive data also emerged for Italy: in 2015, total wine production was 49.5 mhl, a significant increase (5.3 mhl) over that of 2014. Data published by the Italian National Institute for Statistics (ISTAT, 2015) and elaborated by inumeridelvino.it showed that Italian DOC wine production in 2015 was 18.8 mhl, a 15% increase from 2014, and a 20% increase from 2010.

In the last years, wine marketing strategy has been a much debated topic. As further proof of the fact that there is high competition in wine global market. Traditional producer and consumer countries in Europe deal with new world wine producers as United States, Argentina, Chile, Australia and South Africa. Aided by a slow reduction in consumption of wine in the so-called "old world", wine industries need to develop new strategies to differentiate their products.

In Italy, small and medium-sized enterprises, often family-owned, characterize the wine production sector, however, there are several large wine companies as Cantine Riunite/Civ, Caviro, Antinori, and Cavit, which are the top Italian wineries with the highest turnover in 2015 (Mediobanca, 2016).

Regarding the wine production, 2015 was a great year for Italian wines in terms of quantity, on the total of domestic wine productions and for designations of origin wines (DOC / DOCG) which reached 18.8 million hectolitres. Over the last ten years (2005/2015) the overall volume of wine produced in Italy registered an increase of 9%, and compared to 2014, which was a bad year for Italian wine, the volume has grown by 20%. It continues the growing trend of production of quality wines, its increase involves both the production of DOC wines (+15% compared to 2014 and +20% over the last decade) and IGT wines (+11% compared to 2014 and over the last decade). The white wine has the highest

growth in volume produced (+22% compared to 2014 and +18% over the last decade), while the red wine production is stable compared to the last ten years (data published by ISTAT and elaborated by inumeridelyino.it).

Table 1- Italians wine production (hl/1000) – Data source inumeridelvino.it from ISTAT data<sup>1</sup>

	Vino	Bianco	Rosso	DOC	IGT	Comune
(hl/1000)						
2005	47,834	22,506	25,548	15,020	12,726	20,085
2006	47,117	21,876	25,241	14,794	12,598	19,724
2007	40,943	18,860	22,083	14,247	12,034	14,662
2008	43,946	20,803	23,143	14,441	13,129	16,377
2009	43,424	21,474	21,951	15,262	12,271	15,891
2010	44,703	22,174	22,529	15,743	13,953	14,997
2011	40,632	20,396	20,235	15,061	13,592	11,979
2012	38,265	19,629	18,637	16,026	12,546	9,693
2013	45,044	24,046	20,999	17,340	15,787	11,917
2014	39,741	20,874	18,867	16,373	13,452	9,916
2015	47,659	25,567	22,091	18,815	14,895	13,949
2015/14	20%	22%	17%	15%	11%	41%
Media	43,574	21,655	21,938	15,738	13,362	14,472
2015/Med	9%	18%	1%	20%	11%	-4%

Likewise, the export recorded an important growth in value. As showed by Winemonitor by Istat data, in the interval 2005-2015 the value of wine increased from 2980 millions of euro (mln €) to 5353 mln €. In 2016, data was confirmed by ISTAT data elaborated by inumeridelvino.it: from September 2015 to September 2017 Italian wine registered an increment of +4% in value and +1,6% in volume. In the same interval, the best performance is Sparkling wine which reached 1149 million euro, with a growth +23,7% in value and +22% in volume. The top buyers of DOP Italian sparkling wines are UK and USA, with an increase in value over

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http://www.inumeridelvino.it/2016/09/produzione-vino-in-italia-nel-2015-dati-finali-istat.html#more-19061

the 2015 of +69,3% and +94%, respectively; following Germany, Switzerland, France, Sweden, Belgium, Canada, Austria and Norway.

However, for several years, wine consumption of traditional wine producer and consumer countries in Europe showed a decreasing trend. The reduction in the consumption in Italy experienced a pause with a very modest growth as showed by alcoholic beverage consumption report of 2015 (data published by ISTAT and elaborated by inumeridelvino.it). The markets of northern and central Italy registered an increase in consumptions, while in the south of Italy and islands markets did not show any rise. The habitual consumption of wine is a trend in the older age range and in the age group 35-54 years. Data concerning young people did not increase even in the moderate consumption habits, unlike for adult age range (35-54 years) that showed a growth.

Although currently the wine industry in the Marches Region holds a marginal share in the regional economy, it has the potential to help relaunch local economies. One of the challenges to meet in this regard is the emergence onto the Italian and international wine markets.

In countertendency, in the Marches Region a general reduction in the area dedicated to vineyards and in the overall quantity of wine produced had begun well before and continued through 2013, with a decrease in DOC wine production and an increase in that of common wine. The area dedicated to wine production in the Marches Region decreased gradually from 1990 to 2000, with a further decline of 22% (from 19,960 to 15,475 hectares) in the subsequent 10 years. From 2006 to 2013, production remained unvaried, at over a million hectolitres annually. While the total volume remained stationary in this period, there was an upward trend in the quantity of common wines produced, and a downward trend in that of DOC wines. Production of common wines in 2006 was 200,000 hectolitres, while in 2013 it had more than doubled to 500,000 hl. Instead, in 2006

the Region produced 380 hl of DOC wines, which by 2013 had decreased to 346 hl.

Even though overall production remained stable in the Marches Region from 2008 to 2013, this period saw a significant increase in exports, which was a unique trend compared to other Italian regions. In fact, Nomisma data (2015) reported a 65% increase in export value from 2003 to 2013. The 20 designations of origin from the Marches Region performed particularly well in China (+ 613% compared to + 393% of the national average), Russia (+224% Marches Region, +79% Italy), USA (+162% Marches Region, +35% Italy overall) and Japan (+90% Marches Region, +50% Italy overall). The top buyers for Marches Region wines were the United States, accounting for 26% of exports, followed by Japan (9%), Germany (8%), Sweden (8%), the UK (7%), Russia (5%), Canada (5%) and China (4%).

The production of wine in the Marches Region in central Italy was 959 hectolitres (hl) in 2015, of which 348 hl was higher quality DOC (controlled designation of origin) and DOCG (controlled and guaranteed designation of origin) wines. Over the last 4 years the overall volume of wine produced in the Region has grown by 4%, with a 6% increase of DOC and DOCG wine production in just the last year.

Two consortiums protect and promote the 20 protected designations of origin wines produced in the Marches Region. The northern provinces are part of the Istituto Marchigiano di Tutela Vini (IMT), while the provinces of Fermo and Ascoli Piceno are linked to the Vini Piceni consortium. The IMT is the biggest consortium and represents 16 of 20 designations of origin. As such, it has been the leader in promoting these wines abroad.

The IMT, created in 1999, today includes 45% of the region's vineyards, which cover over 8000 hectares. The consortium works with over 850 member wineries in the provinces of Ancona, Macerata and Pesaro-Urbino. The territory was

historically and geographically divided by rivers which form the borders of the various areas of the Marches. The Apennine Mountains to the west and the Adriatic Sea to the east have a great influence on terroir diversification and on the particular sensory characteristics of the wines. The IMT represents 16 appellations, 12 of which are DOC (Bianchello del Metauro, Colli Maceratesi, Colli Pesaresi, Esino, Terreni di San Severino, Lacrima di Morro d'Alba, Pergola, Rosso Conero, San Ginesio, Serrapetrona, Verdicchio dei Castelli di Jesi, and Verdicchio di Matelica) and 4 of which are DOCG (Castelli di Jesi Verdicchio Riserva, Conero Riserva, Verdicchio di Matelica Riserva, Vernaccia di Serrapetrona).



Figure 1 - Wine Map of Marches Region wines by Federdoc<sup>2</sup>

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<sup>&</sup>lt;sup>2</sup> Federdoc (2012), Marche. Available online at: http://www.federdoc.com/vini-a-d-o/marche/

It follows that there is an increasing need to differentiate products from quality point of view, identifying new successful marketing strategies to place the Marches Region wines in domestic and international markets.

From this point of view, Italian and Marches Region wine exports are subject to positive and rising demand, but the difficult economic environment and a high number of Italian wine brands has made it extremely difficult for these small manufacturers to stay afloat. Are there tools to communicate and to make recognizable local wines in the international context? And how can they be used by producers?

Another issues concerns domestic market which suffers a declining trend in wine consumption. In particular, for the younger generations seem to be less interested in drinking wine, compared with the past as they often prefer other alcoholic drinks. They should be the future adult consumers, therefore to understand how reducing the gap we should investigate the reasons underlying of their behaviour, but what are the methods to analyse this occurrence? Is there an informative asymmetry between the world of production and consumption? What is the starting point to establish mid- to long-term strategy?

The study of wine consumer behaviour is a crucial point to elaborate an incisive marketing strategy. If on the one hand, marketing data can provide information to the companies for their positioning, on the other it is crucial to identify the most appropriate communication methods to reach consumers. A non-coherent communication with the consumers' culture and consumption behaviour of the target, probably will result in a failure. For this reason, it becomes important to carry out scientific research to provide insights to SMEs, by adopting traditional and new methods of consumer science.

In the following chapters some research on these issues will be presented. The first chapter, explain the strategy used by consortia for the protection of Marches

Region wines to promote the wine designations of origin through sensory analysis. In the second, will be showed the differences between the communicated and perceived value among producers, through an empirical investigation on the perception of sustainability in the wine industry. The final chapter offers a new perspective to study wine consumer behaviour. Through consumer science research methods and neuroscientific research tools, emotions and expectations related to wine consumption have been investigated.

# Chapter 1

The role of sensory analysis in wine marketing strategy

# 1.1 Sensory analysis as marketing tool for positioning

Sensory evaluation is a scientific method used to evoke, measure, analyse, and interpret responses to products based on perception through sight, smell, touch, taste, and hearing (Lawless & Heymann, 2010). Sensory attributes drive consumer acceptance of wines and influence consumer perceptions of wines (Francis & Williamson, 2015). A number of researchers have combined sensory profiling and hedonic ratings to establish the main sensory drivers of consumer preference for wines, the acceptability of wines (Lattey *et al.*, 2010) or the quality perception of wines (Varela & Gambaro, 2006). According to Santini *et al.* (2011), sensory analysis allows to establish among the many products which one is preferred and why, to use a common and objectively recognizable language for evaluating products and make comparisons among them and to highlight typical and unique characteristics of a specific product.

Since sensory analysis is a scientific tool based on a valid protocol and replicable methodology that provides an objective evaluation of wine, it is not subject to fads or prejudices. This impartial tool to identify the sensory characteristics of a wine can be exploited to formulate a sort of identity card for a wine. Moreover, the results of sensory analysis can be useful in decisions about marketing, guiding choices about product positioning in reference to competitors, market segmentation, customer relationship management, advertising strategies and price policies (lannario *et al.*, 2015).

To identify the sensorial characteristic of Marches Region wines, the Italian Centre of Sensory Analysis used Quantitative Descriptive Analysis, which over the last decades has served to evaluate different types of alcoholic beverages such as whiskies, wines and beers (Piggott & Jardine, 1979; Udé *et al.*, 1984, Schlich & Issanchov, 1990; Vannier *et al.*, 1999). For example, Guinard and Cliff (1987) used Descriptive Analysis to identify the sensory characteristics of Pinot Noir wines from Carneros, Napa and Sonoma, and define the different characteristics of the wines from different areas. In a study on Champagne wines, QDA proved useful for evaluating the sensory evolution during the maturation process and for defining descriptors to be used in developing a quality control system (Vannier *et al.*, 1999).

## 1.1.1 Communication strategy

Communication strategy plays a key role in the marketing planning process. There is an increasing need to differentiate products in the market, and at the same time it is becoming more difficult to catch the attention of consumers who are constantly bombarded by commercial messages and overloaded with

information (Jacoby, 1984). Consumers' perception of a product or of its brand are the synthesis of information decoded from advertising or word of mouth. The decoding process can be the result of conscious reasoning or unconscious sensation Kirmani (1989), that together affect consumer purchasing intentions. Marketers must understand which communication strategy will be most effective for their target market, and choose the communication option that optimizes their marketing communications programs (Lane and Keller, 2001). In the highly competitive wine sector, an integrated marketing communications strategy should not be limited to identifying the target audience or developing a promotional program, but should also seek to create a dialogue with customers.

According to Charters and Pettigrew (2006), clear communication is needed between supply and demand in the wine sector: producers and marketers need to develop their ability to communicate to consumers what they should expect from the wine, and consumers should be able to explain their preferences about wine to wine professionals. The influence of culture on consumer behaviour is a much debated question by academics and marketers (Levy, 1959). In a social representation study of the concept of wine minerality in experts and consumers, Rodrigues *et al.* (2015) found an information asymmetry between the two groups, noting that consumers and producers had only a partial congruence in the mind associations. Using the same method, Mouret *et al.* (2013) compared the social representation of wine in two groups of consumers, the French and New Zealanders, whose cultures and traditions regarding wine differ greatly. They confirmed the importance of culture and expertise in the construction of wine representation and the implications in consumer perceptions.

IMT chose sensory analysis as the foundation for building its communication strategy. The consortium enlisted the help of wine advertising experts to devise simplified materials with icons and images rather than text, which were used by consumers. The objective characteristics identified in the sensory profiles offer

consumers an explanation of the unique attributes that distinguish the wine. The fact that they are phrased in simple, comprehensible language is especially helpful for novice consumers.

# 1.2 Marches Region case study

In regional wine industry there is an increasing need to differentiate products to catch the attention of new consumers in the international market. For Marches Region wine, the increase in competition of large number of producers put at risk the possibility to emerge in the international context. The two consortia to protect and to promote the 20 protected designation of origin of wine produced in the Marches Region decided to use sensory analysis to make them recognizable by domestic and foreign buyers.

The challenge of consortia was to define a communication strategy that would take into account wineries that differ in terms of geographic area, size and production volumes, and the variety of products they offer. At the same time, one of the problems in the Marches Region wine industry is its wines are not clearly positioned and recognized by domestic and foreign buyers. They chose sensory analysis because it is a scientific tool that could objectively define the sensory characteristics of appellations of origin, in order to have specific information for expressing the Marches Region terroir and to educate consumers to recognize Marchigian wine. As part of the goal of better advertising wines from the Marches Region, in 2010 the IMT enlisted the expertise of the Italian Centre for Sensory Analysis (CIAS) to objectively define the sensory characteristics of these products, in order to be able communicate clearly their distinctive characteristics

Furthermore, the consortia through playful aspects of social media and phone application want to engage consumers in tasting experience and consolidate the relationship with consumers.

# 1.2.1 Aims of sensory marketing strategy

Although sensory analysis is widely used in the food industry, the Marches Region is the first in Italy to exploit the results of sensory analysis in its efforts to promote regional wines. The IMT consortium wanted definitions of the objective characteristics of DOC and DOCG wines that it could use for promoting them on the international market. Winemakers can exploit sensory profiles to define the personal style of their company and evoke the memory of the territory and its traditions. Consumers benefit from reading the sensory profiles of a DOC/DOGC wine, because it details the distinctive notes of the product. Daniele Fava, an oenologist and senior consultant in wine advertising who curated the IMT promotional campaign, explained that "there was a need for a scientific tool that could objectively define the sensory characteristics of appellations of origin, in order to have specific information for expressing the Marches Region terroir". In fact, sensory analysis uses Quantitative Descriptive Analysis (QDA), a reproducible method for objectively describing the peculiarities of a wine through language that is easily understood and accessible to all manner of cultures.

#### 1.2.2 Material and methods

#### 1.2.2.1 Material

The wines were chosen for sampling according to four criteria: representativeness in terms of production and market share, number of bottles distributed annually by the producer, the harvest year, and date of bottling. Wines that were too characterized by the producer or that were not very representative of the appellations of origin were excluded.

All protected designation of origin wines that were selected were homogeneous in terms of harvest year: 2009 for vintage wines and 2007 for reserve wines.

The wine samples were stored in a dark and dry place at 12 (±2) Celsius degrees until testing. For evaluations, wine samples were served at room temperature, covered to exclude flavour dispersion and presented in the tasting room (in accordance with ISO 8589 - Sensory analysis: general guidance for the design of test rooms). They were presented in special tasting glasses (ISO 3591:1977 -Sensory analysis: apparatus wine tasting glass) coded with three digit numbers and served anonymously in randomized sequences. Wines were poured 30 minutes before the test, except for sparkling wines, which were poured at beginning of each test (Lane and Keller, 2001). Temperature and humidity of the sensory evaluation rooms were optimized and monitored to avoid potential constraints related to the experimental context. Red lighting was used in the tasting rooms so that testers could not distinguish the colour of the wine, and thus not be influenced by it during the tasting sessions. Software developed by Italian Centre of Sensory Analysis was used for data input, while Senstools software V3.3.1, (OP & P & Talcott, PO Box 14167, 3508 SG, Utrecht, The Netherlands) was used for analysis.

#### 1.2.2.2 Methods

The Italian Centre of Sensory Analysis conducted the sensory characterization of Marches Region wines. It trained two panels, composed of 8-10 professional food tasters, to conduct sensory evaluations of the smell, taste, astringency, flavour and aftertaste of wine, according to "Sensory analysis - General guidance for the selection, training, and monitoring of assessors" (ISO 8586-1 and ISO 8586-2). Each panel member was hired on the basis of interest and motivation, eating behaviour, ability to communicate sensory perceptions, ability to concentrate, availability for testing sessions, and training performance in accordance with standard ISO 8586/1-/2.

Sensory profiles of Marches Region DOC wines were obtained through 80 sensory evaluation sessions conducted from November 2010 to April 2011.

A two-step process was used. First, following the methodology defined for Quantitative Descriptive Analysis, the CIAS with the help of the panels articulated a sensory attributes vocabulary for these products, and developed reference standards for each attribute. Second, for each wine, the panels evaluated the intensity of these descriptors (UNI 10957:2003 – Sensory analysis – Methods for sensory profiling of food and beverages, Stone and Sidel, 1993).

In this process, a wine aroma wheel was used (Noble *et al.*, 1987, see Appendix A, or Figure 1.3 for an example of an adaptation of this wheel), and the list of descriptors was identified according to a Free Choice Profiling technique, excluding irrelevant, redundant and hedonistic terms (ISO 11035 - Sensory analysis – Identification and selection of descriptors for establishing a sensory profile by a multidimensional approach). In this step, reference standards were defined to analyse each specific descriptor for QDA. When was possible were utilized the chemical standard, in some cases standards were defined in the

laboratory using a stable and reproducible over time protocol, in accordance with ISO 11035.

In the intensity scale used to evaluate the intensity of attributes, reference standards (R) were positioned at the level of intensity equal to 80% as showed in the Figure 1.1.



Figure 1.1 - Example of scale utilized for QDA

For each wine, QDA was repeated 3 times in different days, where assessors tasted wines with a different randomized sequences for each session. For the definition of the sensory profile of each wine and to obtain the mean representative profiles of each designation of origin, were compared different wines from the same designation.

Data are analysed using analysis of variance (ANOVA). Descriptive statistics, including means and standard deviations and standard errors (of the mean), are calculated for each attribute and wine. Planned comparisons were then performed to determine differences between means, when there was a significant differences effect in the ANOVA. The least significant differences (LSD) test highlighted the difference in intensity of attributes.

Once the statistical analysis was completed, each designation of origin was represented by a spider plot. In the diagram, each axis represents a single attribute individuated by QDA (as the example of Figure 1.2).

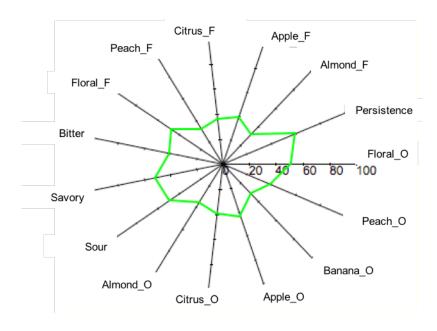


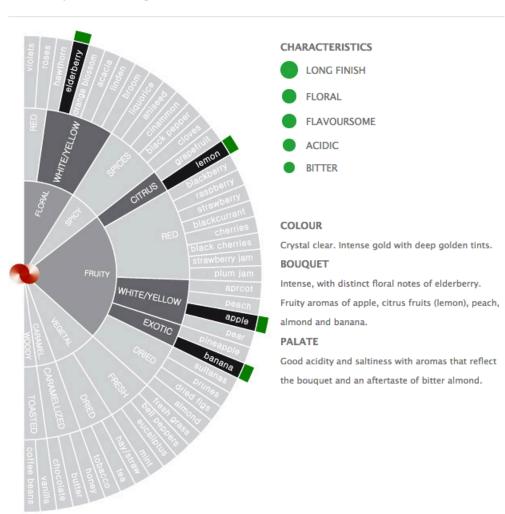
Figure 1.2 - Spider plot of Verdicchio dei Castelli di Jesi DOCG<sup>3</sup>

On the basis of its findings, the Italian Centre of Sensory Analysis created a "Marches Region Wine Aroma Fan" similar to the Wine Aroma Wheel developed by A. Noble (1987). The "Marches Region Wine Aroma Fan" shows the range of flavours identified during the sensory analysis of Marches Region wines, and describes in a simple and original way the distinctive traits of the protected designation of origin wines of the Marches Region, offering a tool that is suitable for implementation in a variety of forms of communication, including new technology.

A card with the Marches Region Wine Aroma Fan was prepared for each Marches Region DOC and DOCG wine. Figure 1.3 provides an example. The bubble chart in the upper right corner represents the distinctive characteristics of the

<sup>&</sup>lt;sup>3</sup> In the description of the attributes, the letter O defines the sensory attributes perceived orthonasally (sniffing the wine), while with the letter F are indicated attributes perceived retronasally (during and after tasting).

appellation of origin wine. The bubble size indicates the intensity of the attribute, and this information is also provided in written form in the summary description of colour, bouquet, and palatability printed below.



D.O.C.G. / CASTELLI DI JESI VERDICCHIO RISERVA

Figure 1.3 - Aroma Fan of Verdicchio dei Castelli di Jesi DOCG – (http://imtdoc.it)

Three concentric rings in the fan describe the aromas. At the centre, the first level indicates the main aromas as floral, spicy, fruity, vegetal, caramel and woody. In the second ring, each macro aroma is further divided into more specific aspects,

so, for example, the fruity macro aroma includes citrus, red, white/yellow, exotic and dried. The third ring goes into even further detail, for example distinguishing between different kinds of white/yellow fruit, such as apricot, peach, apple and pear.

# 1.2.3 Sensory information, communication strategy and the main activities carried out by the consortia

While a protected designation of origin provides consumers with the guarantee that a wine has been produced according to strict rules about grape variety, harvest area, alcohol content, and production methods, as well as reliable reporting of the year of production, others aspects of wine quality are not assured by DOC and DOCG labels. Consumers can only trust sommeliers, wine experts, guidebooks or their own instinct in choosing a wine. The goal of the IMT was to provide consumers with instruments that enable them to be more conscious of the factors to assess when they taste wines and more independent when they choose them. Its strategy was to provide an objective description of the characteristics of protected designation of origin wines through sensory analysis, and to communicate the quality of DOC and DOCG wines of the Marches Region by means of a sensory profile on each product. The IMT web site posted the "Marches Region Wine Aroma Fan" for each of the sixteen designations of origin (http://imtdoc.it/) in support of the communication of Marches Region terroir and specific Marches Region protected designations of origin. This information provides a sort of guide consumers can use when they taste the wine, one that is free of the subjective evaluations of sommeliers or other wine experts. Using these profiles, consumers can be active rather than passive tasters, focusing their senses with the help of a simple and scientific tool.

In 2012, at Vinitaly, the most important wine event in Italy, IMT was the first consortium in Italy to present and to use sensory profiles to communicate the quality of wines. In the Marches Region wine exhibition area, IMT set up a special space where over 100 producers could use the objective results to promote their products to buyers and consumers. The work was summarized in exhibition panels and sensory characteristics cards that consumers could read during the free tasting. IMT continued to publicize the sensory profiles of Marches Region wines on its website, on social networks and web applications, as well as through traditional advertising and participation at wine events.

The Vini Piceni consortium subsequently adopted the same strategy and decided to use the Marches Region Wine Aroma Fans with their DOC and DOCG wines from the southern part of the Region. The two consortiums collaborated to define a complete set of Marches Region wine sensory profiles, thus providing consumers with a comprehensive overview of the Region's high quality wines.

# 1.2.4 The need for a new communication strategy

The difficulties of the current economy have forced wine companies to allocate their economic resources in different ways and have motivated consortia to redefine their goals. The globalization of wine markets has encouraged the growth of Italian wine exports, offering the promise of new consumers, but at the same time it has brought new competition from producers outside Italy. Today more than ever, it is important to study new strategies for exalting the unique qualities of Marches Region wines and thus creating space for them on the global wine market.

By their very nature, protected designations of origin are closely linked to the territory. Terroir, understood as the combination of geographic area and environmental conditions, is not replicable and not exportable, except perhaps in a bottle of wine! However, it is no easy task for wine consortia to market local wines on a global level at low cost. In addition, it is challenging to communicate the quality of Italian wines in other countries, with their different cultures, values and aesthetics: proper market research is required to define the right tone and approach for traditional advertising. According to Daniele Fava, "Sensory analysis is a direct approach that is much appreciated abroad: it is simple to understand and has a scientific basis. Its systematic approach makes it easy to communicate about the wine, breaking down the distance between the wine and consumers in international markets. In addition, the shared vocabulary reduces problems connected to cultural and social misunderstanding." Just as the worldwide web breaks down spatial barriers, so direct explanation of the objective characteristics of a wine reduces the distance between products and consumers.

# 1.2.5 Future challenges for Marches Region wines

Daniele Fava said, "The sensory characterization of Marches Region wines is not a final destination, but a starting point. In fact, there is growing interest in sensory analysis on the part of individual producers who want to compete in international markets. They are aware that there has been a decrease in the quantity of wine consumed, in favour of higher quality. Sensory analysis is an instrument for wine valorization. It does not indicate the best wine, but reveals the sensorial differences, leaving consumers the opportunity to make their choices. Therefore, the next step is to involve producers, getting them to consider the opportunities offered when they understand how the sensory characteristics of their wine

compares to those of other wines with the same designation, so that they can emphasize the distinctive features of their product in wine tasting events and use them to refine their market strategy". Speaking about the point of view of consumers, he added, "We should be aware that we are addressing the global market. The traditional Wine Guides that were widely used in Italy in past years to identify quality wine have a different value today, and exclude a large number of consumers, who do not take them into account in their choices of wines." In this scenario, one can appreciate the growing value of internet and social media, free as they are of the limitations of space and time, because they offer venues for communicating sensory analysis information easily and without filters to a large number of consumers.

One possible drawback to sensory analysis is the risk of impersonal communication lacking the kind of appeal that captures the attention of new consumers. For this reason, IMT should develop an integrated strategy to support the emotional aspect in future wine advertising. Daniele Fava explained, "The use of sensory analysis to communicate objectively about a wine does not exclude the hedonistic and emotional kind of advertising widely used in the wine world. Instead, it opens paths into new markets, reducing the costs associated with social studies of specific markets, and thus costs to consumers."

Other opportunities are offered by consumer science methodologies. For example, correlating sensory profiles and consumer liking scores, it is possible to obtain a Preference Mapping (Thomson and MacFie, 1994) to understand the drivers of consumer preferences. This methodology identifies what kind of wine in terms of sensory characteristics appeals to each specific group of consumers. The results could be useful for consortia or single producers, helping them to correctly position different wines in different markets and to optimise their spending choices.

#### 1.2.6 Conclusion

In Italy, sensory evaluation understood as a study of objective characteristics according to international standards and not as a result of hedonistic evaluation was not frequently used in wine marketing and communication strategies. The IMT consortium is in the vanguard in its work to promote protected designation of origin wines from the Marches Region and the Region's terroir through a sensory strategy. Thus far IMT has built a new model for communicating the unique profiles of these wines, but now it needs to share it. In this direction, new media and web communication tools offer many opportunities for involving consumers. The international language of sensory analysis should prove helpful in educating consumers to recognize Marchigian wine. Social media and phone applications could enhance tasting experiences and playful aspects in the choice of wine and its consumption.

Furthermore, the IMT consortium would be wise to develop strategies to engage local wine producers in an effort to address the decline of production areas and the reduction of quality wine production in the last decade. It should also consolidate the relationship with consumers, to support the increase in exports in recent years and the achievement of new markets.

# Chapter 2

# Sustainability: new development strategy in wine sector or global trend?

Nowadays sustainability is not a trend anymore; it is a necessary pre-condition for the development of social, economic and environmental factors in the agricultural sector as well as a marketing lever for the exploitation of business opportunities.

Many companies are embracing the challenge of sustainability. Nevertheless, many producers still do not have a global vision or a clear strategy for their business. Thus, even if sustainability can be recognized as an opportunity for innovation and diversification, companies have troubles to understand the best strategies to follow (White, 2009).

In the wine sector sustainability is becoming mainstream. In the interval 2002-2013, analysis of Wine Monitor – Nomisma of data provided by the Research Institute of Organic Agriculture (FiBL) showed an interesting growth in areas cultivated with organic vineyard, with a development of +235% in Europe and +273% in the world. Moreover, in 2015 Italian consumers of sustainable wine reached the 16,8%, while in 2013 represented only 2% of population: thus, a steady growth in a short period. Data published by Institute of Services for

Agricultural and Food Markets (ISMEA) showed a sales growth for organic wine of 91% in Italian large-scale retail trade from 2008 to 2014.

The scientific community of agricultural economists and researchers in agribusiness is actively engaged in analysing the social, economic and environmental aspects from different perspectives. For instance, same studies underline how motivation and behaviour of winemakers play an important role in the field of wine sustainability (Casini *et al.*, 2010, Santini *et al.*, 2013). Moreover, many works place attention on environmental and eco-certification claims to understand the value and the benefits associated to eco-labeling by consumers (Olsen *et al.*, 2012: Mueller and Remaud, 2010; Forbes *et al.*, 2009; Remaud *et al.*, 2008; Stolz and Schmid, 2008; Delmas and Grant, 2008; Barber *et al.*, 2009; Delmas *et al.*, 2015), and on the premium price that consumers are willing to pay for an eco-labelled wine (Costanigro *et al.*, 2014; Vecchio, 2013; Berghoef and Dodds, 2011; Brugarolas Mollá-Bauzá *et al.*, 2005).

# 2.1 Consumer perception of sustainability in wine supply chain

Borra *et al.*, (2014), recently investigated how consumer perceives the "greener" vocation of wine: in their work, consumers are asked to define the concept of sustainable and organic wine. They showed that the Italian consumers do not seem to have a wide knowledge of the implications of this concept to vine growing, although sustainable wine has a great appeal for them. Pomarici and Vecchio (2014) compared three wine labels with environmental, social and ethical certifications to understand the millennial generation's attitudes to sustainable wine, and their findings revealed that the label related to social features obtains

the highest acceptance rating, followed by carbon neutral label. Thach and Olsen (2006) in their market segmentation analysis, include environmental and social awareness in the five major traits of Millennial generation, they evidenced that Millennials are interested in quality, fair price, but also in sustainable winegrowing and social practices.

Past researches and market report highlighted that both wine and sustainable consumptions are two relevant topics. Different stakeholder groups associated different concept and meanings to sustainable wine. As a consequence, the complexity of sustainability in the wine sector offers the opportunity to explore conceptual gaps between consumers and producers (Cavicchi *et al.*, 2014; Duffy *et al.*, 2014).

For instance, winemakers perceive quality as a key factor of success, but it often happens that they lose objectivity to evaluate market. In fact, according to Cavicchi *et al.* (2014), this mind-set can be a weakness for the company when it brings to narrow perception of quality produced by competitors; what Theodore Levitt called Marketing myopia, that is when a company defines itself in terms of product, rather than in terms of markets, and it approaches to marketing as a tool for selling product, ignoring the consumer's point of view.

# 2.2 Case study: Social Representation of sustainable wine

## 2.2.1 Objectives

The aim of this research is twofold: on one side we want to understand the meanings that consumers associate with sustainable wine; moreover, it is important to investigate which attributes are the most relevant for consumers when they think about sustainable wine and which expectations they have.

If on one hand we can understand a series of consumer behaviour patterns, on the other hand, we can obtain some interesting information from wine producers. For example, we can understand if they are really committed in pursuing sustainable production methods for ethical reasons and personal commitments, or if they consider them only as a marketing strategy. Moreover we can realize which relations exist between sustainable behaviour and sustainable wine choice, and what are consumers' attitudes towards purchasing sustainable wine.

## 2.2.2 Social Representation methodology

Social Representation (SR) approach is useful to clarify how individuals and groups go beyond mere description to construe meaningful understandings about issues and objects in their social environment (Marková, 1996). According to Moscovici (1989) SR is about a given phenomenon, or object, represented in a population; it is a system of values, ideas and practices with a twofold function: firstly, to establish an order which will enable individuals to orientate themselves

in their material and social world and to master it; secondly, to enable communication to take place among members of a community by providing them with a code for social exchange and a code for naming and classifying unambiguously, the various aspects of their world and their individual group history (Moscovici, 1973).

Abric (1994) after describing SR states: "as defined, the representation is therefore constituted of a set of information, beliefs, opinions and attitudes regarding a given object. Furthermore, this set of elements is organized and structured". SR can be considered as composed of elementary units, connected by mental associations (Lahulou and Abric, 2011).

Several methods have been developed to investigate SR. According to Abric, (2001) the structural approach refers to a Central Core theory, where SRs are considered as socio-cognitive structures regulated by the central core and peripheral element. The first is directly linked and determined by historical, sociological and ideological conditions. It is therefore stable, coherent, consensual and historically marked. Instead, the peripheral system is more sensitive, flexible and determined by immediate context characteristics. It is the first to absorb new information or event capable of challenging the central core (Abric, 1993). In other words, central cognitions determine the significance of the representation, they have a stabilizing role, and they have been shown to be particularly resistant to change. The peripheral cognitions defend the central system and permit the adaptation between it and concrete reality.

For example, Joffe and Lee (2004) explored the SRs of the 2001 Hong Kong avian flu from the perspective of local women. Through SR framework the authors showed that the primary preoccupation was the origin of the flu. Whilst many participants anchored the event to a past health risk, there emerged also the feeling of fear and the memory of killed chickens images.

Recent developments in the food sector have led to a renewed interest in understanding consumer perception of safety according to a SR approach. Behrens *et al.* (2015), analysing the perception of safety in food services, observed that different factors may influence the SRs of costumers: socioeconomic background, the available sources of information, nutrition education interventions and economic constraints. The research also highlights that many customers seem to have a passive role in the choice and they let the responsibility to choose at the restaurant staff. Grabovschi *et al.* (2014) examined the SRs of healthy and unhealthy food of three groups of children from different cultural backgrounds. The differences emerged by different culture and ideological backgrounds confirm the importance of developing strategic and customised campaigns in the field of nutrition education.

A cross-country analysis of Fischer *et al.* (2012) about SRs of energy and climate change showed that participants interpreted both climate change and energy consumption in a context of unsustainable resource use. However, despite their request of political change towards sustainable policy, many interviewees admitted to find challenging to translate their views into behaviour. These findings suggest that the public and policy debate might be more powerful in influencing people's behaviour if built on the existing consensus, in this case, on unsustainable use of resources. The research carried out by Zouhri *et al.* (2016) on the use of pesticides indicated three representational fields that reflect salient issues and geo-cultural anchors in each agricultural territory studied.

In the wine sector, Lo Monaco and Guimelli (2011) focused their study on the effect of consumption practices in SR of different consumers' groups. They observed that consumers and non-consumers did not construct the same representation of wine. Mouret *et al.* (2013), investigated the SRs of wine consumers in France and New Zeland. The aim of their research was to understand the influence of expertise on SRs of wine between two countries with

different history and culture of wine. The results of this investigation show that French consumers associated wine with friendship, red wine and cheese, while New Zealanders considered different flavours as a subject of relaxation and fun, but also linked to food.

Finally, Rodriguez *et al.* (2015) used the structural approach of SR Theory to compare the representations of consumers and producers about the concept of minerality. Either groups pointed out the representation of terroir, but if the central core of winemakers' SR was linked to specific sensory characteristics, for consumers the central core and the first periphery of SR only consist in the term terroir. This outcome suggests that minerality used as a marketing tool might stimulate a collective imagination about the terroir, but its sensory counterpart might not be well understood and it could add confusion.

In our case, this theory lets us understanding if winemakers and consumers have a common representation of sustainable wine and elements which constitute the Central Core.

#### 2.2.3 Material and methods

#### 2.2.3.1 Methods

Following the free association method (Lo Monaco & Guimelli, 2008; Lo Monaco *et al.*, 2009; Mouret *et al.*, 2013; Piermattéo *et al.*, 2014) participants were asked to spontaneously list five words or expressions related to sustainable wine.

Within the framework of studies revolving around objects of SR, 3 and 5 responses are most often requested. The second step is to rank the words generated in accordance with their perceived importance in order to define the

object of representation. So the first task (associative) and the second (ranking) allowed us to make use of two different corpora: the first being used as the object of a rank-frequency type analysis, and the second as the object of an importance frequency analysis (Dany *et al.*, 2015). On the basis of this method we can hypothesize, in an exploratory way, what are the central and peripheral elements of representations of sustainable wine, and to compare the elements between groups of consumers and producers.

According to Abric (2003), in the central core there are the representations with high importance and high citation frequency (Figure 2.1). The first periphery of representation is constituted by high citation frequency and low importance elements. The contrasting zone corresponds to the representations with a low citation frequency and high importance. This area includes elements susceptible to change. Finally, the second periphery includes the representations with low citation frequency and low importance.

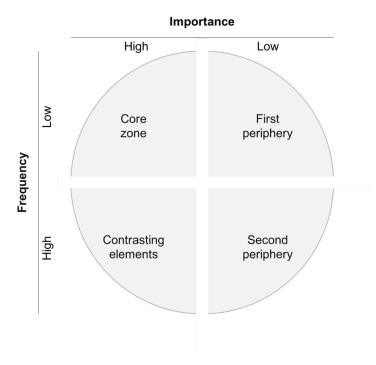


Figure 2.1 - The representation areas emerging from prototypical analysis of social representation (Abric, 2003)

In order to process data, words and concepts were lemmatized to identify root words and reduce all words to their roots. Consequently, we performed a cross-tabulation of two criteria of appearance frequency of the term and its importance mean (Abric,2003). In the second step, according to Dany *et al.* (2015), we compared the frequency and importance scores of certain terms within the representational fields. Therefore, we allocated an importance ranking to generate terms: to term classified as the most important we will allocate value 5, the one classed second in importance, value 4, and so on. This procedure generated two scores (frequency and importance) for each term.

Explorative comparison of two cross-tabulation about SRs of consumers and producers helped us to find out the differences and similarities on central and peripheral SR of sustainable wine.

#### 2.2.3.2 Data collecting and sampling

Data were collected by using questionnaire in electronic and traditional version, between April and September 2016. Respondents were selected randomly for each Italian Nielsen areas.

339 Italian wine consumers were interviewed and, according to Dany *et al.* (2015), asked to indicate the first five words or expressions that come in their mind in relation to sustainable wine and in a second step they ranked them in order of importance. In the same way, words or expressions associated to sustainable wine elicited by 20 wine producers were recorded. Participants were left free to list fewer associations with a minimum number of three words or expressions. The words and the expressions listed represent the Social Representations of Italian consumers and producers interviewed.

### 2.2.4 Results

The number of consumers is much more representative than producers interviewed, however, analysing the data have emerged some interesting findings.

From the comparison of producers and consumers SRs emerged the constitutive elements of core and periphery of representations of two groups (Table 2.1 and Table 2.2).

Table 2.1 - Producers SRs of sustainable wine (N = 20) importance - frequency method

Frequency	Importance						
	High		Low				
High	environment	gas emission reduction	Quality				
	natural	innovation	<b>,</b>				
	healthy	local					
	good	love					
	organic	marketing					
	km0	pollution					
	additive free	rules					
	dop/doc						
Low	biodynamic	social	ability	Country			
	consequence	sustainable agriculture	accessible	expensive			
	•	attention	delicate	Fair			
	docg						
	glee	confusion	ecological	fair trade			
	smart	handmade	happiness	Lie			
	terroir	Igp/igt	low cost	New			
	trend of the moment	knowledge	non-sence	Robust			
	local	party	profitable	Treated			
	passion	price	respect for consumers				

A dimension related to environment, is in the central core of SRs for both the two groups, that are sensitive to environment, pollution reduction and gas emission reduction. In the same way, they elicited some elements connected to the production methods such as organic and additive free. Moreover, it emerged the

SRs of territoriality: consumers and producers gave importance to km0, local productions and designations of origin (dop/doc), as well as, the healthiness and goodness of wine. As shown in Table 2.1, producers, ordering high frequency and high importance, cited also the words innovation, love, marketing and production rules. It seems that for interviewed producers, sustainable wine is an opportunity to differentiate their product in terms of innovation and marketing strategy, but at the same time it represents a commitment from an environmental and health point of view. In the contrasting element zone and second periphery of producers SRs, there are citations connected to economical sustainability as price, low cost/expensive and profitability. Table 2.2 shows that consumers, together with environmental and health implications (concepts that are repeated by producers as well) evoked some ethical issues as respect for workers, fair trade and fair price. We can easily connect these three words to the three aspects of sustainability: social, economic and environmental. It is also evident that some peripheral elements are not directly linked to sustainability dimension, evoking different images and nuances of wine sector (for example the quality and the different sensory characteristics of wine). Consumers have cited with high frequency and have given high importance to safety, clarity and control properties of sustainable wines. They have in the central core other SRs related to environmental category such as recyclable bottle and pack, green energy, sustainable agriculture and low environmental impact. The only brand associated and cited by consumers in relation to sustainable wine (in contrasting elements zone) is the Italian brand Libera Terra (free land), which consists of several associations that have as their first aim the fight against the mafia organizations. Contrasting element zone and second periphery of consumers SRs include also characteristics linked to typology of wine (white, red, rosé, sparkling) and sensory attribute (sweet, dry, not sour, mellow, full-body, alcoholic, hot).

Table 2.2 - Consumers SRs of sustainable wine⁴ (N = 339) importance-frequency method

Frequency	Importance					
	High			Low		
High	organic	dop/doc	Green	natural		
	healthy	respect for workers	Aroma	pest free		
	good	pure	from producer	Italian		
	local	terroir	Origin	quality		
	ecological	be encouraged	original	nature		
	km0	expensive	sustainable agriculture	soil respect		
	environment	pollution reduction	Bottle			
	fair trade	taste	Cellar			
	low cost	clarity	certificated			
	additive free	recyclable bottle	green energy			
	sulphite free	respectful	support			
	safe	gas emission reduction	igp/igt			
	controlled	recyclable pack	low productions			
	handmade	simple	producer			
	low environm. impact	fair price				
	ethical	price				
Low	good grape	white	digestible	no waste		
	hot	full-bodied	Dry	responsibility		
	real	work	Fair	lie		
	rules	affordable	famous brand	wine varietal		
	alcoholic	appearance	future	care		
	available	farmer	grape harvest	from grape		
	curate	kindness	important	need		
	manpower	pack	Libera Terra	renewable		
	refined	project	low consumption	sensory characteristics		
	rich	sparkling	mellow			
	strong	tannin	not intensive productions			
	wort	transport	not sour			
	sweet	honest	recycling			
	biodiversity	docg	regional			
	grape	economy	research			
	accessible	for everyone	wine cooperative			
	desirable	laborious	tradition			
	fruity	natural fertilizer	autochthon			
	label	palatable	red			
	rosè	develop	social			
	small farm	light	unique			
	support	mediocre	guaranteed			
	water	vineyard	homemade			
	acceptable	waste reduction	ogm free			
	vintage	low alcohol	respect for producers			
	colour	appreciated	territory protection			
	cork	coherent				

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 $<sup>^{\</sup>rm 4}$  The terms mentioned only once were excluded from the table to make it more legible. For complete table see Appendix B.

#### 2.2.5 Discussion and conclusions

Despite the two groups are not balanced in number of interviewees, some relevant aspects are emerging from the importance-frequency method: if on one side it is clear that questions connected to environment, health, territory and production methods as organic, are at the core of SR for both producers and consumers, it is also evident that confusion in communication can be generated in light of the other crucial attributes elicited through the interviews in both core and peripheral social representation. For example, producers find in sustainable wine a key for innovation, but consumers could not identify it as such. Similarly, consumers could expect from a sustainable wine which is sulphite-free, but producers could ignore this aspect.

Furthermore, social and managerial implications emerge from this analysis. For instance, the element of price appears only in the central core of consumers SRs. It can be considered an important driver to purchase and it should be taken into account by the producers marketing strategy. Another aspect included in the central core of consumers SRs, but only in the second peripheral area of producers, is the fair trade. This social aspect of wine sustainability, is very relevant for interviewees consumers, supported by the high importance given to the SRs ethical and respect for worker. Considering the increase in volume and value of fair trade product in Italy showed by 2015 annual report of Fairtrade Italia, this sector assumes even more significance from a managerial point of view.

In both cases respondents listed two elements (in the second periphery) with negative connotations: lies and non-sense. These points suggest uncertainties and preoccupation of stakeholders and they offer interesting information to operate in terms of wine policy and communication strategy.

Although with SR analysis it is only possible to formulate hypotheses to understand the presence or not of different SRs among different group, it is a

valid tool to formulate more accurate marketing strategies. Social psychology methods are applied only recently in wine consumers research; SR methods can be useful to investigate the difference in perception in different groups of people or stakeholders in the wine supply chain. Future research in SR of sustainable wine could include measurements of consumption habits to better understand the relations between sustainable wine choice and wine consumer behaviour.

## Chapter 3

Emotion in the glass: innovative study to understand unconscious reactions in wine tasting

#### 3.1 Emotions and wine

Wine consumption is a social and cultural phenomenon; it is difficult to separate its consumption from the context or occasions in which it is consumed. Symbolic universes that make sense in a given culture generate habits and consumption behaviour.

Most would agree that the senses of smell, taste, touch and appearance influence the cognitive and emotional perception of wine. In recent years, the role of emotions on consumption behaviour has been a much-debated topic, and many studies have explored the nexus between emotions and food intake. Different authors have investigated the implication of feeling states on food consumption, preference and eating behaviour to examine their involvement in eating disorders (Canetti et. al, 2002). Mehrabian (1980) identified a relation between greater amount of food intake and such emotional states as depression, boredom, and

fatigue. The Lyman (2002) study examining emotions in food consumption found a significant tendency to consume healthy food during positive feeling states and junk food during negative emotion states. In 2007, Desmet and Schifferstein examined the emotions experienced by healthy individuals when they taste or eat food. They noted that such pleasant emotions as satisfaction, enjoyment, desire and amusement were more frequent than unpleasant ones like boredom, disappointment, dissatisfaction and disgust. They examined five different sources of food emotions: 1) sensory attributes (for example, the pleasant surprise of the taste of an exotic fruit), 2) experienced consequences (like the relief after drinking a large glass of water), 3) anticipated consequences (when we hope to stay healthy by eating vegetables or we feel guilty after eating unhealthy food), 4) personal or cultural meanings (when a food reminds us of a particular person or moment of life), and 5) actions of associated agents (for instance, if we admire a chef for his skill or are disappointed by food that is worse than expected).

Regarding emotions and wine consumption, Ferrarini *et al.* (2010), identified a set of Italian adjectives to describe the feeling of wine consumers during wine tasting and wine consumption experiences. They began with 453 emotion adjectives related to consumption and narrowed them to a final list of 16 adjectives to describe the emotions elicited by wine consumption, then interpreted with the bi-dimensional model of the Russell's emotional lexicon (1979). According to Wansink *et al.* (2006), environmental cues have an impact on food intake and can generate positive or negative expectations. Danner *et al.* (2016) studied the influence of wine quality, wine liking and the effects of consumption context in consumer emotions, and indicated the importance of considering context and emotions in marketing strategy. In their experiments, they found that high quality wines stimulate more intensive positive emotions, and similarly, that the restaurant context generates more intense positive emotions than home consumption or a laboratory context. This research also showed a

strong relationship between wine that evoked positive intense emotions and willingness to pay. In fact, they registered an increase in willingness to pay (WTP) in absence of negative emotions, and a significantly high WTP for a bottle of wine when the consumers were enthusiastic and passionate in consumption.

# 3.1.1 Implicit and explicit methods for studying emotional responses

The crucial point of our study was to measure the emotions of wine consumers. In the traditional explicit methods used in consumer studies, participants declare their emotional responses to products, while the implicit methods are used to investigate the unconscious emotional responses. As reported by Mauss and Robinson (2009) in their review, there are different ways to study emotional response, and no one measurement standard is the best, nor are they interchangeable. The authors examined five types of measurements, implicit and explicit, and associated to each one the respective aspects of emotional state best captured by it. With the first type of method, self-report, participants spontaneously declare what they feel; it is more efficient if the emotions are revealed during or immediately after the stimulus, although people may not be aware of or capable of identifying their emotional states. In the second type of study, measurements of emotional response are carried out by monitoring autonomic nervous system (ANS) phenomena such as electro dermal or cardiovascular responses (for example in sweat glands or the circulatory system). While this method does not provide explanations for the distinct emotional patterns related to the ANS measurements, it is useful for identifying emotional valence and arousal states.

The third type examines startle response magnitude, based on startle reflex in the eye blink; electrodes placed over the orbicularis oculi muscle provide electromyogram measurements. When the avoidance system is activated, the electrodes register a defensive response. This method is more sensitive to negative than to positive stimuli. The fourth method also involved explicit measurements, in this case examining brain states, most commonly by using the electroencephalograph (EEG), which identifies the electrical activation of specific brain regions that are linked to states of approach or avoidance. Functional magnetic resonance imaging (fMRI) is a more accurate instrument than EEG, but it is certainly more invasive. The fifth method measures facial or body behaviour, specifically with assessment of vocal characteristics useful for understanding levels of emotional arousal, and micro facial expressions, which are very sensitive to the emotional valence, but influenced by gender and socio-cultural aspects.

Beside traditional self-report, many authors focus on other explicit methods such as verbal and visual Self-Reports. Researchers have examined and assessed different types of questionnaires for defining the emotional profiles of a product. King and Meiselman (2009) developed EsSense Profile<sup>TM</sup>, a methodology to measure acceptability of the product and emotions of consumers during a product test through a questionnaire. After tasting products or while consuming each sample, the consumers have to express their opinion on a hedonic scale and describe their emotional state by selecting the terms on the questionnaire closest to their feelings. The authors provide a list of emotions that can be expanded according to the specific product categories or specific applications. In the questionnaire, the emotions can be indicated by "check all that apply" (CATA) or data scaling. In 2014, Spinelli *et al.* used a semiotic approach to develop EmoSemio<sup>R</sup> to study the emotions stimulated by the sensory characteristics of products. The questionnaire was designed with a one to one interview and a

Repertory Grid approach. Consumers taste a product and start to describe what they feel while tasting the product. Researchers use a semiotic approach to construct the semantic categories that represent the emotions to evaluate. Finally, the consumers rate the items responding to the question "How does it make you feel?" on a 5 point scale of the EmoSemio<sup>R</sup> questionnaire. Unlike EsSense<sup>TM</sup>, the EmoSemio<sup>R</sup> uses a discursive form to present the list of emotions that were previously identified by the Repertory Grid Method. This aspect is useful for reducing ambiguity and obtaining valuable and consistent results.

One criticism of these methods is that verbal measurements necessarily involve ambiguity. To overcome this problem, many authors substituted the list of verbal emotions with a series of images evoking the emotional states, as in the Self-Assessment Manikin Technique (SAM) developed by Bradley and Lang (1980), in which the respondents check the image that in their opinion best portrays their emotion. The advantage of this method is the absence of the verbal self-report instrument, but the disadvantage is that it measures only emotional states and not the different emotions. PrEmo (Desmet, 2003) is another non-verbal self-report instrument, applied to food and non-food products, that measures 14 emotions. In this case, the consumers express their emotions by choosing from a variety of cartoon animations that simulate facial, bodily and vocal expressions. However, with PrEmo, respondents cannot recognize themselves on cartoons and are unable to identify their own emotional states.

# 3.1.2 Neuromarketing tools for understanding consumer emotions

In recent years, neuromarketing, which applies the principles of neuroscience to marketing methods, has become widely used. The main instruments are the EEG and fMRI to measure emotional reactions through changes in brain activity states, the face coding, to interpret the physical aspects of facial expressions that identify the different moods evoked by given stimuli, and for eye-tracking, to identify the movements or focus of consumer's eyes when they are exposed to the product or product images.

Saarni (2009) highlighted that the people find it difficult to discern, assess, and describe their own emotions. Posner *et al.* (2005) suggested that it is difficult for people to recognize emotions as isolated or discrete entities, because they perceive them as ambiguous and overlapping experiences.

In our research, we decided to use an implicit method to investigate unconscious emotional responses. In particular, we have chosen EEG because this method records brain electrical activity in a way that is not additional cognitive effort for the consumer during the test. Unlike tests involving self-report, this method does not require consumers to articulate in rational language something that is irrational.

As explained by Ariely (2010), the EEG uses electrodes applied to the scalp to measure electrical field activity in the brain region underneath. It is able to record a neuronal event with high frequency. It is a quite old technology in neurology, and new instruments such as fMRI offer more information, but it is still considered a good compromise for measuring brain activity for marketing research (Morin, 2011). When the brain is subjected to a stimulus, it produces electrical currents that have different patterns of frequencies associated with different states of arousal. The academic literature based on left-right asymmetry of the frontal EEG

signals suggests an association between increased activity of the left frontal region and positive emotional experience, or motivational drive to approach to the stimulus (Davidson, 1990; Harmon-Jones, 2003; Plassmann, 2012). Obviously, the EEG does not enable us to predict with full certitude what reactions or consumer behaviour will be generated by the stimulus, but the data it yields does afford some understanding of the unconscious evaluation of the stimulus, and some indication of positive or negative influences on consumer behaviour.

In the last few years, EEG has been frequently used in advertising to test the effectiveness of advertising campaigns. For example, Ohme et al. (2010) compared three TV messages for the same product, the Sony Bravia television set, and observed significant differences in the reactions to the emotional and informational parts. In particular, one of the three messages was significantly more engaging in all the scenes. The EEG data indicated that the first part of the spot, which aimed to communicate the television's unique colour, favoured consumer attention during the informative scene at the end of spot. This suggests that the use of EEG is able to provide important feedback about consumer reactions while watching TV advertisements. Other studies attempted to analyse media content integrating traditional survey methods with neurophysiological tools such as EEG (Yang et al., 2015; Venkatraman, 2015; Cartocci et al., 2016). In recently research, EEG was utilized in consumer testing to measure the emotions associated with food. Van Bochove et al. (2016) compared the results of EEG recorded data with hedonic evaluation of food. They found correlations between posterior parieto-occipital resting state EEG asymmetries and selfreport answers on food evaluation questionnaires. To predict purchasing decisions when brand and price changed, Ravaja et al. (2012) examined EEG asymmetry over the prefrontal cortex. Consumers were asked to make purchase decisions about 7 private label products and 7 national brand products with 16 price levels, and after experiments the participants filled in a questionnaire about perceived product quality. The results showed an increase in left frontal activation just before the purchase decision and a strong association between affirmative purchase intention for national brand products and left frontal activation. Comparison with the questionnaires indicated that there was an increase of left frontal activation during the purchase pre-decision for products indicated as high quality in the questionnaire.

# 3.2 Case study: the study of unconscious reactions in wine tasting using EEG and an expectation test.

This study highlights the potential offered by the combined use of consumer science tools and consumer neuroscience methods.

In traditional expectation testing, data is gathered through questionnaires compiled by the consumers. Instead, our study took electroencephalogram measurements of participants as they engaged in a three-part expectation test ("blind", in which participants taste wine but do not know the provenance, "expected," in which they express their expectations based only on reading the bottle label, and "labelled," in which they taste the wine and can read the bottle label) for four white wines, homologous in price and vintage, in order to identify and analyse their emotional responses. The three phases of the traditional expectation test provide input on which stimuli (their own sensory experience, or information from reading the label) influence consumer emotions as they evaluate

the products. In addition, in our study, for each wine in each part of the test, the EEG measurements that indicate intensity and emotional value were recorded and subsequently analysed following Russell's Circumplex Model of Affect Theory (2003). Furthermore, the activities of the temporal lobes that are responsible for memories were recorded and evaluated, to understand the commitment and the difficulty to remember associations with particular stimuli. The results highlighted the variance of emotions during the three phases of the expectation test, and identified the strength and weakness of emotions evoked by the different wines.

This work offers a new point of view in the evaluation of the cognitive conscious and emotional aspects that together drive consumer decision-making and purchasing behaviour.

# 3.2.1 Integration of consumer science methods and consumer neuroscience research

While the electroencephalogram (EEG) has traditionally been used in medicine to diagnose encephalon disorders by measuring electrical activity in the brain (Morin, 2011) it has also become a tool for understanding psychological and emotional states through observation of brain waves. Modern portable EEG devices cause little to no discomfort for those examined and do not disturb consumers during evaluations, thus allowing collection of a good deal of data without limits due to the observation context and longer period of exposure to the stimulus.

The literature presents several studies that used EEG to analyse brain activity during observation of advertisements (Vecchione *et al.*, 2010) or to investigate consumer attitudes (Lee, 2014; Sebastian, 2014). In our research, we investigated the possible opportunities offered by this tool for understanding the expectations of wine consumers by recording measurements indicative of their emotions.

The expectation test has proven to be a valuable method for obtaining data for consumer behaviour studies, As proposed by Cardello (1994) and suggested by other authors in the wine sector (Mueller & Szolnoki, 2010; Dowels *et al.*, 2014), the expectation test method allows evaluation of the sensory and hedonic expectations by comparing the consumer evaluations in a blind test in which consumers only receive sensory stimuli from the product (taste, aroma, appearance, etc.) with a test where the subjects have full information about the product. Data is collected through questionnaires answered by participants.

The goal of our study was to explore the combination of EEG data, generally devoted to neuropsychological inquiry, with data produced in expectation tests in order to assess the complementarity of results and the feasibility of implementing this dual-source data, in comparison with data obtained with the traditional method alone.

In particular, in this project we used EEG to record brain activity in reaction to the various stimuli from four different white wines in the blind, expected and labelled phases of the expectation test.

The aim of our experimental research was to explore the following areas:

 evaluate whether the emotional response indicated by EEG could be useful for wine marketing strategy;

- understand the variance in expectation during the blind, expected and labelled phases;
- identify the degree of impact each wine has on the consumer's emotions in the expectation test.

According to Stefani *et al.* (2006), expectation tests can be set up in phases to provide consumers in different step stimuli about sensory characteristics, label information and a combination of the two. In the blind tasting phase, the participants saw, smelled and tasted the wine but did not know anything about the label, and thus could only trust in their senses in evaluating the wine. In the second step, the participants had to evaluate the wine exclusively on the basis of information on the bottle label, without tasting the wine. In the last phase, the consumers saw, smelled and tasted the wine and also saw the label, as in a real tasting test. Thus in our study the three-part expectation test provided an understanding of how information affects consumer evaluation of wines, but in a different way than in traditional expectation tests, in which data is collected through questionnaires. In our study, the participants did not self-report their opinion, but their EEG data was recorded and analysed to indicate the degree and kind of emotions evoked.

As in the traditional test, the data were compared in each phase of the experiment to understand the impact of the three different stimuli on consumer emotions. In the traditional test we can analyse evaluations in order to comprehend consumer expectations. Instead, by studying the EEG asymmetry it is possible to investigate consumer emotions related to expectations. The EEG measurements were analysed using Russell's circumplex model of affect theory (2003), according to which emotions derive from two independent neurophysiological systems, one related to emotional valence, and the other to arousal, activation, or alertness level. Valence refers to a continuum that varies from positive to

negative in terms of pleasure and displeasure, while arousal refers to a continuum that varies from calm to excitement (Russell, 1980). According to this theory, every affective experience is a consequence of a linear combination of these two independent systems. Emotions are the product of the degree of intensity of both valance and arousal (Figure 3.1). Fear, for example, is the result of a combination of negative valence and high level of arousal (Posner *et al.*, 2005). The circumplex model of affect theory was supported by psychometric studies that indicated the two latent dimensions of emotions (Feldman Barrett and Fossum, 2001; Garber *et al.*, 2008).

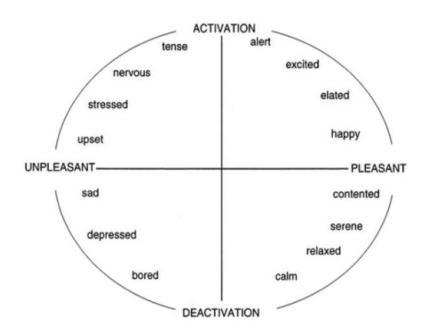


Figure 3.1 - The circumplex model of affect: the horizontal axis represents the valence dimension and the vertical axis represents the arousal or activation dimension

Using facial electromyography (fEMG), heart rate and skin conductance, Lang *et al.* (1993), correlated increase in skin conductance and heart rate with ratings of arousal. To confirm the consistency of the dimensional theory of valence and arousal, Bradley *et al* (2003) used fMRI while subjects looked at emotionally

evocative pictures, and found correlations between signal intensity in the visual cortex and arousal levels. Similar studies with EEG discovered the same evidence in relation to cerebral activation and subjective ratings of arousal (Keil et al., 2001). Furthermore, emotional valence seems to be associated with fEMG measurements that record the corrugator and zygomatic musculature. In this direction, experiments by Cacioppo et al. (1986) that exposed 28 subjects to positive and negative scenes indicated an incremental increase of corrugator activity with negative valence, measured by fEMG, when the subjects described a specific affective state. Advanced techniques of neuroimaging have allowed researchers to better understand the neural substrates of emotion involved in the elaboration of emotional valence and arousal.

#### 3.2.2 Materials and Methods

#### 3.2.2.1 Participants

Eight volunteer consumers (2 females and 6 males) were recruited by the Italian Center of Sensory Analysis, a consulting company in R&D and marketing for the agro-food sector, based in Matelica, central Italy. The subjects, Matelica residents between the ages of 26 and 60, were selected randomly among wine lovers, enthusiasts, sommeliers, professional tasters or people employed in wine sector with medium to high knowledge about wines and high involvement in wine tasting.

#### 3.2.2.2 The expectation test

Samples were randomized and coded with three digit numbers for each step of the expectation test. To minimize external errors relating to the test setting, consumers received the products in a different sequence from each other.

The four Italian white wines tested were Verdicchio di Matelica DOC, Verdicchio dei Castelli di Jesi DOC, Offida Pecorino DOC, and Soave DOC. The first three are designations of origin wines produced in the Marches Region, while the fourth is produced in the Veneto Region. All the wines had the same vintage and price range.

Before the tests, participants received information about the test and the use of EEG. They were invited to relax and behave naturally. Before starting the test, brain activity was measured by EEG when the subjects were at rest, without any stimuli. The test began when consumers felt at ease.

The test was divided into three phases:

in the blind phase, consumers received wine samples without information, and thus the stimulus consisted only in the sensory characteristics of the product;

- in the second phase (expectation), consumers received information about the wines by reading the labels but did not see or taste the wines;
- in the last phase (labelled), consumers had full information about the wines, in that they could read the labels of the wine bottle as they tasted the sample

In the first two phases, consumers were free to explore stimuli for one minute. For example, they could taste the wine more than once in the first phase, or read the label leisurely in the second phase. Instead, in the third phase they had two minutes to taste the wine and look at the labelled bottle. During the test, consumers did not know the sequence of presentation of the wines.

#### 3.2.2.3 EEG recording

The brain electrical activity was recorded by EEG in order to identify the inference associated with the stimulus. The EEG used during the experiment was able to detect brain activity with a frequency of 128 Hz. The equipment made it possible to record the performance over the time and not only as a static datum. For each consumer, reactions to the stimuli were recorded during the whole performance.

In the Circumplex model of affect (Figure 3.1), the emotional valence is described by the x-axis, while the y-axis represents the intensity of emotions indicated by differences in activation of the left and right.temporal-parietal lobes.

According to Russell (2003) and the literature, based on left-right asymmetry of the frontal EEG, activation of the left hemisphere is associated with the approach behaviour to the stimulus and positive emotions, while greater right hemisphere activation is related to avoidance behaviour and negative emotions (Figure 3.2).

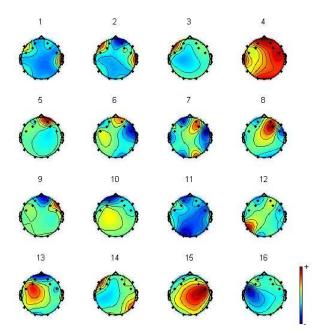


Figure 3.2 - Example of brain activation of one subject during blind stimuli. Images 1 to 4 are related to Pecorino DOC, 5 to 8 Verdicchio di Jesi DOC, 9 to 12 Verdicchio di Matelica DOC, and 13 to 16 Soave DOC.

#### 3.2.3 Results and Discussion

In the blind phase, the Verdicchio di Matelica DOC and the Verdicchio di Jesi DOC obtained very similar average positive emotional valence values (Figure 3.3), though the Matelica wine had lower emotional intensity values (Figure 3.4) and thus a lower index of involvement.

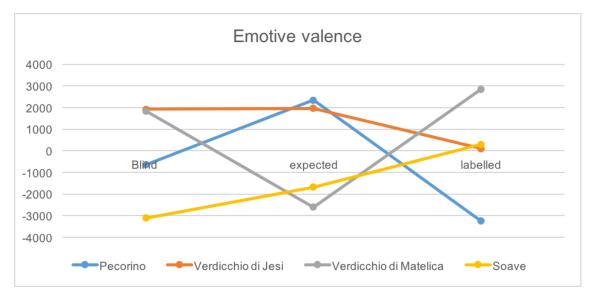


Figure 3.3 – Emotional valence values of the 4 wines in the three phases of the expectation test, namely blind, expected and labelled

In the expected phase, the Verdicchio di Jesi DOC produced a markedly better reaction, while the Verdicchio di Matelica evoked markedly negative emotional valence values (Figure 3.3), even though with a very limited intensity (Figure 3.4). Only the Soave evoked negative reactions for both variables.

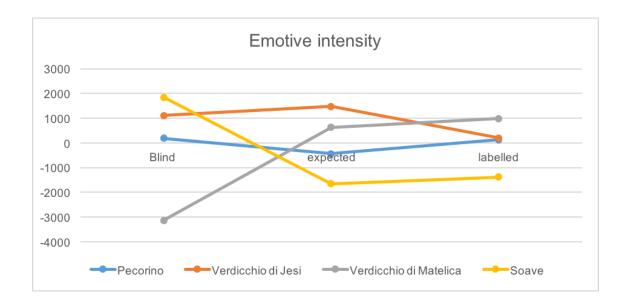


Figure 3.4 – Emotional intensity levels for the 4 wines in the blind, expected and labelled phases

In the third part of the test, consumers were presented with a wine sample and the labelled bottle. In this phase, the Verdicchio di Matelica DOC was differentiated from the others in that it received more positive values, while the Soave DOC and the Verdicchio di Jesi DOC were positioned at the same level. Instead, the Pecorino Offica DOC obtained results that were not excellent.

As can be noted from the chart of emotions organized according to Russell's affect theory (Figure 3.5), the general results show that the most positive emotion descriptors, such as excited and happy, were found for the two Verdicchio wines analysed.

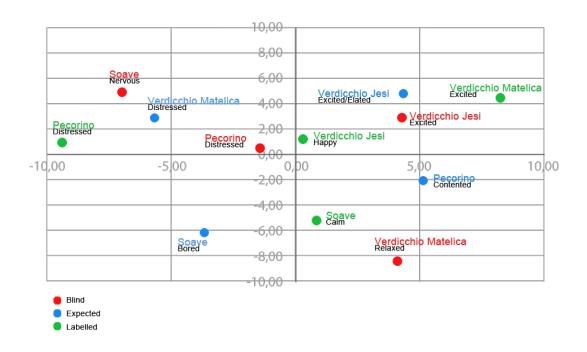


Figure 3.5 – Chart of emotions according to Russell's Affect Theory

The Verdicchio di Jesi DOC seemed to have a constant performance in the different phases of the test, and above all in the expected phase, in which the consumers saw the bottle label but did not taste the wine. The Verdicchio di Matelica DOC obtained positive results in the blind phase, when the consumer focused on the sensorial aspects alone. Instead, the results worsened markedly in the second phase when the only stimulus was the bottle label. The emotional valence of the Verdicchio di Jesi DOC label in and of itself was confirmed and was coherent with the blind evaluation. The Verdicchio di Matelica DOC, in the second phase with just the bottle label, was penalized by a negative emotional valence, while in the third phase, when tasting was combined with information on the bottle label, the positive emotions were markedly higher than those evoked by the other wines. The reason probably lies in the consumers' previous knowledge about and experience of this wine.

The Pecorino Offida DOC obtained opposite results from those obtained in the various sessions with the Verdicchio di Matelica DOC. It was interesting that the Pecorino phase 2, with just the label, evoked positive emotions, while in the blind test of tasting alone, the wine elicited negative emotions. This implies that the brand or DOC status creates very high expectations, but in the third phase when consumers taste the wine and see the label, the opposite occurs, probably because their expectations have been disappointed.

The Soave DOC received the least satisfying results in all three phases of the test. Slightly positive emotional reactions were recorded only in the third phase when consumers could taste the wine and see the bottle label.

#### 3.3 Conclusion

The emotional components of consumer behaviour regarding product choice and purchasing cause or are the consequence of psychological and physiological processes that are difficult to monitor univocally with one instrument alone. Certainly, by combining a number of techniques, such as questionnaires, qualitative research and instruments of neuromarketing, researchers can obtain a more complete set of information for understanding and foreseeing with greater precision the behaviour that guides consumer decision making.

Though our study was only exploratory and based on observation of a small number of consumers, it shows some of the possibilities offered by the integration of consumer science methods and neuropsychological techniques and instruments. The use of EEG enabled exploration of the cognitive and conscious aspects, and above all evaluation of the emotional and unconscious aspects

associated with wine, which are much more difficult to perceive with traditional instruments.

The research protocol used made it possible to measure the emotion elicited by both sensory stimuli and the appeal of the label and the designations of origin of different wines. The work methodology enabled registration of unconscious emotional evaluations that together influence consumer behaviour related to wine.

This preliminary study opens the way for future inquiries to define with greater precision the decision-making process, and thus also the purchasing process, in particular through the integration of neuroscientific methods and traditional ones used in consumer science.

### Conclusion

The proposed applied research, represents a starting point for the positioning of Italian and Marches Region wine sector. In accordance with the priorities of the European Commission, which finances promotion measure able to support agrifood producers to sell their products in an increasingly competitive world, today more than ever, it is important to carefully look at what happens in the global context having respect of the needs and the uniqueness of the local distinctive features.

This dissertation does not provide "the" winning solution for local wine companies, but it proposes different points of view to formulate new marketing strategies consumer oriented.

In particular, the first chapter, offers interesting implications to preserve the local identity in the international context. In fact, IMT and Vini Piceni consortia of protection have chosen a unique communication strategy to differentiate the regional designations of origin and at the same time strengthening the regional wine brand; marketing and communication strategies were based on sensory analysis and this choice allowed producers to define objectively the sensory characteristics of their wine to promote and develop a transparent advertising campaign. The shared vocabulary of sensory analysis, frees the communication from any misunderstanding and consumers can approach the wine in a simple way and with extreme clarity. From local to global level, the strategy adopted by Marches Region consortia, was useful to make more recognizable and better

positioning their wine in domestic and international markets; the next step for consortia could be the consolidation of the relationship with producers, encouraging the increase of production areas of quality wine, and with consumers, using the opportunity offered by new media to enhance tasting experiences.

The use of Social Representation Theory in the second chapter, showed the importance of social and psychological aspect in wine communications. The presence of difference in product evaluation between producers and consumers can be a weakness for the company which approached new market as for example sustainable wine. To avoid phenomena as the marketing myopia, producers should take into account the consumer's point of view. The application of social psychology research methods could represent a strength in a mid- to long-term marketing strategy to reduce the informative gap between who produces wine and who consumes it.

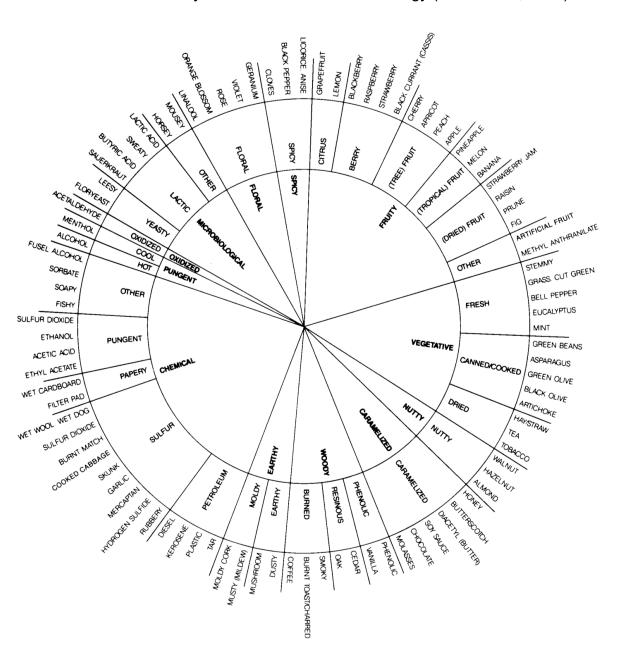
Finally, in the last chapter, neuromarketing tools allow to verify more accurately the determinant emotions in the wine and test the effectiveness of communication in consumers' mind with a lower economic effort than one might think. In the specific case, EEG permitted a more thorough and valid assessment, because it let to recorder the unconscious emotional evaluations and measure it during wine consumption and in the evaluation of pack, without the influence of rationalization. Investing in this research method, companies can define with greater precision the decision-making process, and thus also the purchasing process.

From an academic point of view, the multidisciplinary character of this thesis permitted a useful overview that better represents the real context of applied research. The social psychology has already provided a great contribution to the consumer behaviour science and marketing researches; in the same way in the

agriculture economics field it offers a new perspective to study the most complex sectors such as the wine supply chain with a more comprehensive and innovative view.

## Appendix A

Wine Aroma Wheel - system of wine aroma terminology (Noble et al., 1987).



# Appendix B

#### Consumers SRs of sustainable wine (N = 339) importance- frequency method

Frequency	Importance			
	I Carlo			1
	High			Low
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High	organic	dop/doc	price	natural
	healthy	respect for workers	green	pest free
	good	pure	aroma	Italian
	local	terroir	from producer	quality
	ecological	be encouraged	origin	nature
	km0	expensive	original	soil respect
	environment	pollution reduction	sustainable agriculture	
	fair trade	taste	bottle	
	low cost	clarity	cellar	
	additive free	recyclable bottle	certificated	
	sulphite free	respectful	green energy	
	safe	gas emission reduction	support	
	controlled	recyclable pack	igp/igt	
	handmade	simple	low productions	
	low environmental	fair price	producer	
	impact	fair price	producer	
	ethical			
Low	acceptable	small farm	glass bottle*	no waste
	accessible	social	good brand*	responsibility
	affordable	sparkling	grape processing*	lie
	alcoholic	strong	great	wine varietal
	appearance	support	hand*	care
	appreciated	sweet	hand picking*	from grape
	autochthon	tannin	ideal*	need
	available	territory protection	impactful*	renewable
			in compliance with the tax	sensory
	biodiversity	tradition	laws*	characteristics
	coherent	transport	innovation*	advantageous*
	colour	unique	intense*	no mafia*
	cork	vineyard	interesting*	business model*
	curate	vintage	laudable*	change*
	desirable	waste reduction	legality*	chemical*
	develop	water	local development*	Coldiretti*
	digestible	white	market*	collaboration*
	docg	wine cooperative	melancholy*	competitiveness*
	dry	work	modern*	complicated*
	economy	wort	northern Italy*	consumption*
	fair	activity*	not blended*	controlled origin*
	famous brand	ad hoc production*	not counterfeit*	decent*

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<sup>\*</sup> terms mentioned only once

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