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The influence of the "organic" attribute on the assessment of quality and the perceived value in the case of wine

ABSTRACT

The aim of this study is to evaluate the influence of the presence of the "organic" attribute on consumer preferences in the case of wine. Using the Becker-DeGroot-Marschak mechanism, this study introduces the evaluation of sensory and non-sensory attributes information into the assessment of consumer perceived quality and consumer willingness. The originality of this article is due to its methodology which integrates hedonic evaluation into the analysis of consumer preferences. The results before, the tasting, confirm the positive effect of the organic attribute on the consumer's evaluation. Thus, the explicit presence of the organic attribute improves the assessment of expected quality and willingness to pay (purchase value). After the blind tasting, the results show that the organic attribute does not exert a significant influence on the hedonic evaluation. However, the assessment of the perceived quality and willingness to pay for a wine improves significantly with the presence of the organic attribute.

INTRODUCTION

This research focuses on information about the organic production system or the type of wine culture. The organic attribute is related to a type of viticulture subject to the European rules of organic farming and winemaking. Thus, the organic attribute can be considered an intrinsic attribute of the quality of the wine. However, sensory and analytic studies show no significant differences between conventional and organic wines.

In a first moment, the consumer cannot taste the product, so he tries to anticipate the results of his decision based on certain attributes and indicators available, relevant and accessible. In a second step, after having tasted or consumed the product, the consumer can re-evaluate the product by adding, to non-sensory cues, the information of the sensory cues of the product (i.e., the smell, the taste, the colour, texture, etc.). The whole evaluation depends on the partials assessments before and after consuming the product. This study measures this whole evaluation by perceived quality and value.

According to the literature, to choose and evaluate a wine, it is a very hard task for consumers because it demands to evaluate several different cues at the same time (Calvo Dopico et al. 2009; Kolyesnikova et al. 2008; Parsons and Thompson 2009; Sáenz-Navajas et al. 2014). The cues of a wine can be grouped in two: the intrinsic attributes (related to the nature of product); and the extrinsic attributes (price, brand, etc.). Therefore, the evaluation of a wine is only possible after tasting, but consumers have to evaluate and choose before tasting the product, based only on extrinsic cues(Charters and Pettigrew 2007).

Despite, past research shows the influence of sensory attributes on perceived quality and value. There is little research that incorporates sensory attributes in the assessment of perceived quality and willingness to pay for organic wines. On the one hand, it seems relevant to ask how the presence of the organic attribute influences the perceived quality and value of the wine, but also if organic attribute modify the hedonic evaluation of a wine (before and after tasting), therefore, this study has two objectives.

The first objective is to evaluate the influence of the presence of the "organic" attribute on the hedonic evaluation. ***The second objective***, is to evaluate the influence of the organic attribute

on the global consumer perception, measured by the perceived quality and de willingness to pay (before and after the wine tasting).

BACKGROUND

Impact of organic attribute on hedonic consumer evaluation

According to the literature, the two main motivations of consumers of organic foods are: the health benefits and the organoleptic quality of the food (Aertsens et al. 2009; Stolz et al. 2010, 2011). However, in the case of wine, the organic attribute does not seem to be considered an asset, because: first of all, given its nature as an alcoholic beverage; and then, its negative organoleptic quality image.

In addition, wine consumption is above all a matter of pleasure and conviviality (Lo Monaco et al. 2009; Olsen et al. 2012). Thus, the organoleptic characteristics of the product would be more important, than in the case of other foods in general.

The literature, in the case of wine consumption, shows that consumer assessment focuses mainly on: taste, type of wine, alcohol content, vintage, colour, price, brand , the type of label, the bottle, and the name or denomination of origin (Lockshin and Corsi 2012). This is why blind tasting offers the possibility of isolating the influence of non-sensory indicators of the product (e.g., the price or the organic label) and sensory attributes (e.g., taste and smell). on the perception of quality and the value of the product.

The wine tasting allows to introduce three hedonic information about the product: (i) the colour of the wine provides information regarding age, body, sediment and potential wine defects (Kilcast 2013); (ii) the aroma, according to Rapp (1998) in the case of wine, there are between 600 and 800 aromatic components, between varietal, fermentation and rearing aromas; and (iii) the taste perception, that it is a complex combination of sensations (olfactory, taste and trigeminal).

The results of the European ORWINE project shows that most French consumers have a negative opinion of the taste of organic wines, associated in particular with past tasting experiences. A minority of consumers associate the organic attribute with a high level of organoleptic quality (Stolz and Schmid 2007). Nevertheless, at the current stage of knowledge, it is not possible to assert the existence of sensory differences between organic and conventional wines. Thus, during a blind tasting, consumers would be unable to differentiate between organic and conventional wines from a sensory point of view. For those reasons, this first part ought to answer the following hypothesis:

Hypothesis 1: the presence of the organic attribute does not significantly influence the hedonic evaluation of the consumer.

- H1a: the presence of the organic attribute does not significantly influence the evaluation of the colour of a wine.
- H1b: the presence of the organic attribute does not significantly influence the evaluation of the aroma of a wine.
- H1c: the presence of the organic attribute does not significantly influence the evaluation of the taste of a wine.

Impact of organic attribute on consumer perception: the wine case

According to the Total Food Quality Model, in food perception is possible to distinguish two phases: the pre-purchase phase, where consumers evaluate the product based on non-sensory and the post-purchase phase, where consumers can taste the product. During de first phase, consumers use mainly non-sensory cues (i.e., price, vintage, region, etc.) to evaluate the expected quality and the customer value. During the second phase, consumers use sensory (i.e., flavour, colour, mouthfeel) and non-sensory attributes, at the same time, to evaluate the experienced quality and the consumer value (Grunert 2005).

This study focus on this temporal dimension of the consumer perception. In other words, how consumers perception changes over time. It makes possible to follow framework of experience and credence attributes (Nelson, 1970; Darby et Karni, 1973). On the one hand, experience attributes could be evaluated after tasting the product, confirming or rejecting the expectations about this characteristics. On the other hand, credence attributes cannot be evaluated after tasting the product (Grunert and Ramus 2005).

In the case of wine, most of the literature agrees to consider it as an experience good. Because, most of the sensory attributes can be perceived only after consumption (Ali and Nauges 2007; Aqueveque 2008). However, the organic attribute could be related with different types of benefits (e.g., for health, environment and society) that cannot be verified even after consumption. Therefore, the organic attribute is a good example of a credence attribute.

According to Peter Drucker (1985) « *quality in a product or service is not what the supplier puts in. It is what the customer gets out and is willing to pay for* ». In this sense, it is plausible to evaluate perceived quality and value as a temporal sequence, before and after tasting the product and integrating information related to non-sensory attributes (before tasting) and non-sensory plus sensory attributes (after tasting).

Previous research confirms, that the overall evaluation of a wine could be directly influenced by the interaction of non-sensory indicators of quality (e.g., the label and the brand) and the hedonic evaluation associated with sensory attributes (Combris et al. 2009; Mueller and Szolnoki 2010).

The wine overall evaluation could be measured by different indicators as the purchase intention, the willingness to pay or perceived quality. In this sense, previous research shows that purchase intention is influenced directly by the interaction of sensory attributes and non-sensory indicators and as well as willingness to pay (Combris et al. 2009; Mueller and Szolnoki 2010).

The assessment of the expected quality at the point of sale in the case of wine is almost exclusively based on the perception of non-sensory cues (i.e., AOC, label, price, vintage, etc.), because there is no direct sensory interaction with the product, in contrast with other fresh organic food products. Is therefore wine provide a good category product.

Despite the consumers generally do not consider organic wines to be better than conventional wines (Remaud and Sirieix 2012). Previous research shows a positive evaluation of organic attribute in the case of wines. This is fundamentally associated with environmental implications. More importantly, US consumers are willing to pay extra for wines provided they are environmentally friendly, even if they consider themselves unable to evaluate the sensory complexity of the wine (Barber et al. 2014).

For that reason this section aims to analyse the impact of the organic attribute information (credence attribute) on consumers perceived quality (expected and experienced) and value, measured as the willingness to pay, before and after the tasting of the wine.

Hypothesis 2: the presence of the organic attribute influences positively the perception of the perceived quality of a wine.

- H2a: the presence of the organic attribute influences positively the perception of the expected quality of a wine.
- H2b: the presence of the organic attribute influences positively the perception of the experienced quality of a wine

Hypothesis 3: the presence of the organic attribute influences positively the perceived value of a wine.

- H3a: the presence of the organic attribute influences positively the CAP before tasting a wine.
- H3b: the presence of the organic attribute influences positively the CAP after tasting a wine.

METHODOLOGY AND PROTOCOL

The sample was constituted by the quotas method. The criteria for selecting participants were: (i) to be wine consumers (at least once a month); (ii) be under 60 years of age; (iii) preferably in activity; (iv); do not work in the wine industry; and (v) have not participated in any such study (e.g., marketing, tasting, etc.) within the last three months. Participants were recruited by a agency specialized in consumer panels and sensory analysis, with the financial support of the Regional Council of Aquitaine. The sample (n = 148) was balanced in terms of gender.

Choice of wines

Given that the objective of the study, the first attribute retained was the wine culture (conventional and organic). The rest of the attributes included in this study were obtained, on the one hand through discussions with experts and consumers, and on the other hand, from previous empirical studies mainly involving wine consumption in Europe and especially in the French market. Thus, this study retained: the colour of wine (red), the geographical origin denomination (Saint-Emilion) and the vintage (2012).

In order to select the wines to be tasted by the participants. We appealed to the Viticulture and oenology team of Bordeaux Science Agro, composed by oenologists and experts in sensory analysis. After the tasting sessions, the judges chose two an organic and a conventional wine.

The organic wine was a Saint-Emilion 2012, certified and labialized (AB and EU); the selling price of this wine at the supermarket (BioCop Victor Hugo) was 10.86 Euros. The conventional wine was a Puisseguin Saint-Emilion vintage 2012, with no label nor medal. The selling price of this wine at the supermarket (Monoprix Bordeaux Saint Christoly) was 9.90 Euros.

The stages of the consumer tasting

The experiment took place in two stages: (i) evaluate two wines only from non-sensory information; and (ii) the sensory evaluation of the two selected wines with non-sensory information.

First step: non-sensory information

In this stage of the experiment, each participant must evaluate a wine from two different information levels:

- First level: Colour + AOC + Vintage;
- Second level: Colour + AOC + Vintage + Bio Attribute

On the basis of the information provided, the participants had to evaluate different wine criteria: taste, quality and consent. To do this, we used a mono-item scale (0 to 7).

Second step: non-sensory + sensory information

The assessments were measured using hedonic scales (0 to 7), widely used in this type of empirical study (Saeed and Grunert 2014; Veale and Quester 2009). For the tasting, this study mobilizes a simultaneous triangular presentation. First, a glass containing the conventional wine and two glasses containing the same organic wine. Second, only one of the organic wine samples shows the organic attribute. And finally, the participants were asked to evaluate the three classic criteria of a wine: the colour of the wine, the aroma of the wine and finally the taste of the wine.

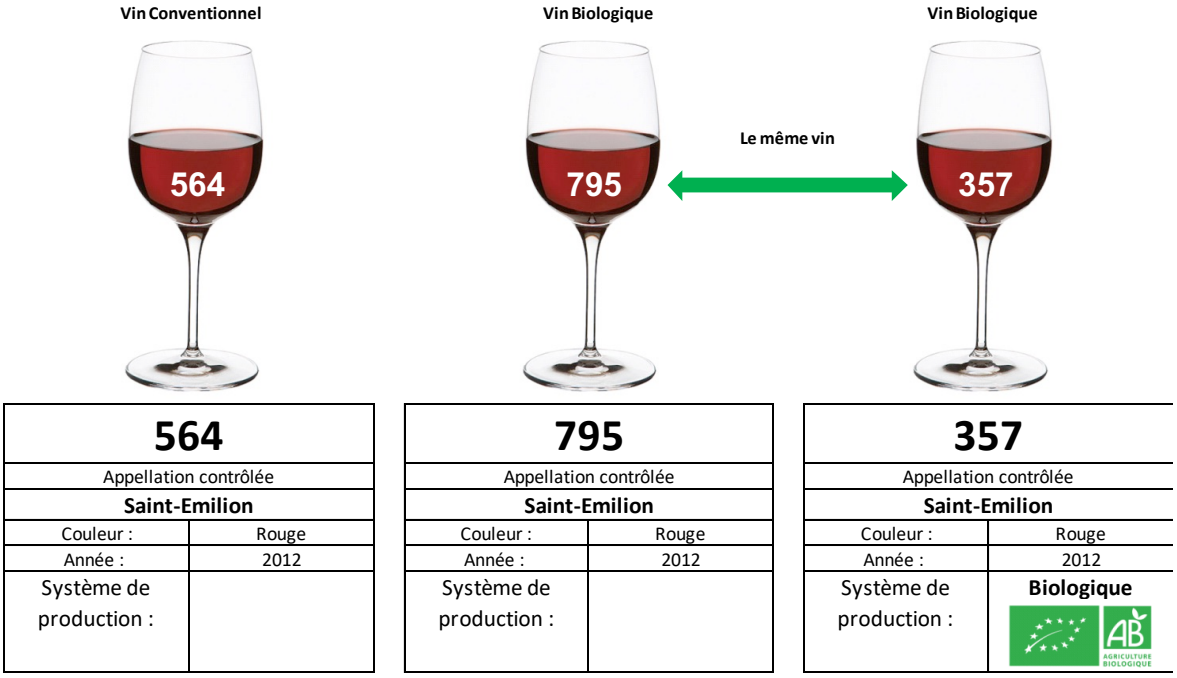

Figure 1: Information and coding of tasted wines

In order to avoid any order effect, individuals could choose the order of the tasting of the 3 samples. All sessions were performed in accordance with identical conditions of presentation of samples. All sessions were held with a maximum of 16 participants, in a tasting room with individual cabins and at controlled temperature conditions. All wines were served in standard INAO transparent glasses (20 ml) at a tasting temperature of 18 ° C. Each sample, glasses

were coded with three-digit random numbers (see figure below). Finally, all participants had a glass of water to rinse their mouths between tastings.

RESULTS

Given the characteristics of our data set, we chose to test our hypotheses using two econometric models: a ordered Logit model in the case of perceived quality (expected and experienced) and a panel data model for the willingness to pay.

The organic attribute in the evaluation of the sensory attributes of a wine

Confronted with the three wine samples, the participants were unable to find any significant differences. Thus, it can be argued that the presence of the organic attribute does not influence the evaluation of wine colour. Therefore, hypothesis H1a is validated.

The aroma evaluation rank shows conventional wine in first place (5.42 points), the organic wine showing the organic attribute in the second place (5.13 points) and in the last place, the organic wine not displaying the organic attribute (4.97 points). Thus, the aroma of the conventional wine was rated as the best, compared to organic wine (with and without the organic attribute). In other words, the analysis shows that conventional wine is significantly better rated than organic wine (with and without the organic attribute). From these results, it could be concluded that the aroma evaluation is not influenced by the presence of the organic attribute. Consequently, Hypothesis H1b is validated by the observations.

Before the tasting, participants confronted with two wines with the same non-sensory information. The taste expectations are significantly influenced by the presence of the organic attribute. It seems that consumers consider that organic wines are better than conventional wines. These results are consistent with other studies of other organic foods (Aertsens et al. 2011; Pieniak et al. 2010; Thøgersen 2009).

However, it would appear to contradict other studies that generally show a negative image associated with organic wines (Olsen et al. 2012; Remaud and Sirieix 2012; Stolz and Schmid 2008). Although, this result could be interpreted only as the effect of the marginal information even if the consumer is not aware of what the organic attribute exactly means.

Tableau 1. nonparametric mean comparison test

		Before tasting	After tasting		
		Conv Wine vs Org. Wine	Org Wine (without) vs Org Wine (with)	Org Wine (without) vs Conv Wine	Org Wine (with) vs Conv Wine
Colour	Mean		-.082	-.034	.048
	s.d		.757	.882	.942
	Z		-1.397	-.471	-.522
	p		.162	.638	.602
Aroma	Mean		-.164	-.459	-.295
	s.d		1.238	1.434	1.477
	Z		-1.914	-3.683	-2.508
	p		.056	.000	.012
Taste	Mean	-.096	-.130	-.425	-.295
	s.d	.881	1.620	1.729	1.762
	Z	-2.033	-1.299	-3.061	-1.992
	p	.042	.194	.002	.046

After tasting, conventional wine obtain the highest rating (5.0), followed by the organic wine displaying the organic attribute (4.7) and at the end the organic wine without the organic information (4.6). Accordingly, from a flavour perspective, consumers rate both organic wine samples (with and without the organic attribute) as similar. In other words, the presence of the organic attribute does not significantly influence on the taste assessment of the wine. Therefore, hypothesis H1c is validated.

Before tasting, consumers expect on average a better taste of wines displaying the organic attribute compared to conventional wines. This result is in line with the case of other food products from organic farming. After tasting, it seems that the presence of the organic attribute does not affect the hedonic evaluation. This could be associated with the hedonic and quasi-aesthetic character of the wine. In other words, the explicit presence of the organic attribute does not influence the taste preferences of consumers. Therefore, it is possible to conclude that the presence of the organic attribute impact significantly the sensory evaluation of the consumer. As a result, the hypothesis 1 is validated.

The impact of the organic attribute on the perceived quality

Before tasting, the participants consider that the presence of the organic attribute increases the perceived quality of the wine. After tasting, the quality assessment shows a downward revision for the three samples. As in the hedonic evaluation, conventional wine is remains the best ranked (5.0 points), followed by the organic wine showing the organic attribute (4.9 points) and the finally the organic wine without organic attribute (4.6 points). Before tasting, the Wilcoxon test leads to the rejection of the hypothesis of equality of means.

Therefore, it is possible to deduce that consumers expect a superior quality of wine displaying the organic attribute compared to wines that do not display it. Thus, the presence of the organic attribute significantly influences the expected quality of a wine with the organic attribute. This result validates the hypothesis H2a.

After tasting, comparing the scores of the two organic wine samples (with and without the organic attribute), the Wilcoxon Averaging Comparison test shows a significant difference. This means that the experienced quality is influenced by the presence of the organic attribute.

Tableau 2. Non-parametric means comparison test of quality and WTP

	Before tasting							
	Expected Quality				**WTP**			
	Moyenne	Ecart-type	Z	Sig.	Moyenne	Ecart-type	Z	Sig.
Conventional wine - Organic wine	-.247	.936	-3.818	.000	-1.270	2.433	-6.724	.000
	After tasting							
	Experimented Quality				**WTP**			
Org wine (without) - Org wine (with)	-.349	1.393	-3.012	.003	-.976	3.505	-3.681	.000
Org wine (without) - Conv wine	-.404	1.547	-2.964	.003	-1.162	4.054	-3.069	.002
Org wine (with) - Conv wine	-.055	1.553	-.674	.500	-.186	3.919	-.554	.580

In the same sense, there is a significant difference between the experimented quality of the organic wine without the organic attribute and the conventional wine. In contrast, the difference of the experimented quality scores of the organic wine displaying the organic attribute compared to the conventional wine, is not significant. In other words, the perceived quality of organic wine displaying the organic attribute is statistically similar to that of

conventional wine. Consequently, the presence of the organic attribute influences significantly the experimented quality. Therefore, the hypothesis H2b is validated.

Evaluation of the purchase and consumption value

Before the tasting, based solely on non-sensory information, the willingness to pay for a red wine, Saint-Emilion, vintage 2012 is 10.1 Euros and 11.4 Euros for the organic version of the same wine, that is a difference of almost 13%. After the tasting, the willingness to pay for the conventional wine is 9.4 Euros, 9.2 Euros in the case of organic wine displaying the organic attribute and 8.2 Euros for organic wine without the organic attribute.

The willingness to pay difference between organic wine with and without the organic attribute is 12.2%. The difference between the organic wine without the organic attribute and the conventional wine is 14.6% and the difference with organic wine displaying the organic attribute is only 2.1%. Thus, it is possible to infer that the presence of the organic attribute, *ceteris paribus*, increase the purchase value of a wine. The presence of the organic attribute influences positively the willingness to pay before the tasting. In other words, the organic attribute adds value for the wine consumer. As a result, hypothesis H3a is validated.

After tasting, regarding the consumption value, when comparing the willingness to pay of the two samples of organic wine (with and without the organic attribute), we find a difference of about 1 euro (12.2%). Thus, it possible to reject the hypothesis of equality of the willingness to pay between the organic wine with and without the organic attribute information. Given that consumers tasted the same wine, the difference of 12.2% can be explained mainly by the presence of the information carried by the organic attribute.

Comparing the organic wine without the organic attribute and the conventional wine, the difference between the two CAP is more important, of the order of 1.2 Euros. The non-parametric test, allows us to affirm that the difference of the willingness to pay of the organic wine without the organic attribute and the conventional wine is significant. In contrast, comparing the same organic wine but displaying the organic attribute and the conventional wine, we cannot reject the statistical equality of the averages of willingness to pay. In other words, the difference between the willingness to pay of the organic wine without the attribute and the conventional wine (14.6%) becomes equal to zero when the organic attribute is displayed. The presence of the organic attribute seems to increase the added value of a wine that would otherwise be less valued. Thus, the hypothesis H3b is validated.

From these two results, it is possible to infer that the presence of the biological attribute influences the perception of the customer value (before tasting) and the consumer value (after tasting). As a result, it is possible to validate the whole Hypothesis 3.

Tableau 3. Validated hypothesis

Hypothesis 1: the presence of the organic attribute does not significantly influence the hedonic evaluation of the consumer.	Validated
H1a: the presence of the organic attribute does not significantly influence the evaluation of the colour of a wine.	Validated
H1b: the presence of the organic attribute does not significantly influence the evaluation of the aroma of a wine.	Validated
H1c: the presence of the organic attribute does not significantly influence the evaluation of the taste of a wine.	Validated
Hypothesis 2: the presence of the organic attribute influences positively the perception of the perceived quality of a wine.	Validated
H2a: the presence of the organic attribute influences positively the perception of the	Validated

expected quality of a wine.	
H2b: the presence of the organic attribute influences positively the perception of the experienced quality of a wine	Validated
Hypothesis 3: the presence of the organic attribute influences positively the perceived value of a wine.	**Validated**
H3a: the presence of the organic attribute influences positively the CAP before tasting a wine.	Validated
H3b: the presence of the organic attribute influences positively the CAP after tasting a wine.	Validated

CONCLUSION AND IMPLICATIONS FOR THE THEORY AND PRACTICE

This research enhance the compression influence of the sensory and non-sensory attributes on the consumers perceptions of quality and value in a temporal perspective. In particular, before the consumption, the influence of the non-sensory attributes on the expected quality and the customer value (measured by the willingness to pay). After the consumption, the influence of the organic attribute (non-sensory) on the experimented quality and consumer value (measured by the willingness to pay).

This study shows that the organic attribute does not influence the hedonic perceptions of the consumers, but in contrast this attribute increases the overall evaluation of a wine measured by the perceived quality (expected and experimented) and the perceived value (purchase and consumption).

From a managerial perspective, it is important to align consumer expectations with the proposed offer and the consumer experience. This requires a congruence between perception of quality and value before consumption (expected quality and purchase value), which is evaluated from non-sensory indicators of quality (e.g., price, brand, label, etc.); and the assessment of quality and value after consumption (quality of experience and consumption value), which is assessed from sensory attributes (e.g., aroma or taste) and non-sensory attributes.

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