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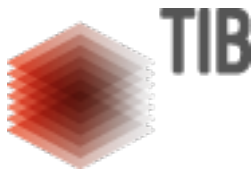
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# Tasting green: an experimental design for investigating consumer perception of organic wine

Tasting green

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## Abstract

**Purpose** – There is empirical evidence that the image of organic products has a stronger effect on consumer perception than the intrinsic characteristics. Against this background, the aim of this paper is twofold; first, to ascertain if the stimulus “organic food”, placed by storytelling, influences the perception of wine. Based on this, the study tries to discover wherein a positive perception of organic wine might be reflected (e.g. willingness to pay premium prices, better taste perception).

**Design/methodology/approach** – Focusing on the consumer perception and evaluation of conventional versus organic wine, it was decided to use an experimental design with a blind taste test procedure. The prediction was that subjects would rank a wine described as organic higher than a conventional wine – even if there is no objective difference. Consumer perceptions and attitudes toward the wines were assessed using a questionnaire including wine preference, buying and recommendation intention, and willingness to pay. Besides, consumer wine knowledge and consumer personal environmental orientation were measured as individual constructs.

**Findings** – In accordance with existing research insights, consumers tend to prefer organic products over conventional ones. In this context, the experiment shows that adding information on the product’s process during a blind test leads consumers to increase their ratings in favour of the “organic wine”. Interesting is that consumers even give a better rating for “conventional wine” just described as being “organic”, indicating that the appearance and taste are perceived to be better, and the price intention is higher – thus, a pure signalling effect is achieved.

**Originality/value** – The key finding of the study was that even if they tasted the identical product, the respondents ascribe a significantly better taste to the organic-labelled wine compared to the conventional alternative. Besides, the willingness to recommend the organic wine and the willingness to pay differed significantly from the evaluation of the red wine presented as “conventional”. Moreover, regardless of their knowledge and attitude towards organic products in general, all respondents rated the so-called organic wine higher in all given attributes.

**Keywords** Consumer perception, Organic food, Experimental design, Wine

**Paper type** Research paper

## Introduction

Referable to the increasing attention of organic products by consumers in the last two decades (Bonti-Ankomah and Yiridoe, 2006; Cicia *et al.*, 2002; Wier and Calverley, 2002), especially since the 1990s persists a multitude of studies concerning the determinants of organic food consumption (Aertsens *et al.*, 2009; Gil *et al.*, 2000). Particularly, two major trends in the agriculture industry may be causally for this development in consumers’ consumption behaviour: Primarily, an increase in food-related diseases such as mad-cow disease and bird flu and second, an increase in



the use of genetically modified food (Hamzaoui Essouissi and Zahaf, 2008; Siderera *et al.*, 2005; Vindigni *et al.*, 2002; Chen, 2007, 2009).

Against this background “organic production” eliminates a number of concerns that consumers hold towards conventional production (Hamzaoui Essouissi and Zahaf, 2008; Siderera *et al.*, 2005). Consumers start integrating environmental considerations into daily purchases which leads to a higher demand by the so-called “green” consumer for healthier, safer, and better quality food (Krystallis and Chryssohoidis, 2005). Focusing on attitudes and behaviour towards organic food, existing studies have investigated the role of personal, health- and environmentally-friendly behaviour, risk or value perceptions in organic food behaviour, and demographic characteristics of organic food consumers (Chen, 2009; Magnusson *et al.*, 2003; Lockie *et al.*, 2002). As products inhibit extrinsic and intrinsic cues, consumer’s quality perception relies on their product related knowledge (Veale, 2008).

In this context, there is empirical evidence that the image of organic products has a stronger effect on consumer perception than the intrinsic characteristics. The so-called halo or blurring effect can modify the sensory perception of products in terms of a positive halo effect for organic and origin labelled food products and a negative one for more conventional products. Consequently, many authors argue that most consumers are willing to pay premium prices for organic food products, especially for wine (Krystallis and Chryssohoidis, 2005; Forbes *et al.*, 2009).

According to this background, the aim of the present study is twofold; first, to ascertain if the stimulus “organic food”, placed by storytelling, influences the perception of wine. Based on this, we try to discover wherein a positive perception of organic wine might be reflected (e.g. willingness to pay premium prices, better taste perception).

The paper is developed in the following way. Section two briefly reviews consumer perception on organic food and wine before introducing the research questions of the study. After providing an outline of the experimental design with detail on the applied blind test, the main empirical results are discussed. In section five, we conclude with managerial implications and starting points for further research in the fields of organic food production and wine marketing.

## Theoretical background

### *Organic food production: definition and trends*

The organic food market is a rapidly growing sector in developed agricultural economies around the world (Lockie *et al.*, 2002; Chen, 2007). Thus, the areas with the greatest land of organic agricultures are located in Australia/Oceania, Latin America, and the European Union (Siderera *et al.*, 2005), whereby Europe with a 54 per cent share of global revenues currently holds a leading position in the organic food and beverage market (Stolz *et al.*, 2010). Due to the regulation 2092/91 the meaning of organic production processes gained public interest and in contrast to health food, organic or bio food underlies a much stricter and more clearly defined term:

Organic food is a produce of organic farming, which is a type of farming that sets very strict limits on the amount of artificial synthetic inputs allowed. (. . .) These inputs include the ones used in production (fertilisers, pesticides, herbicides, antibiotics, etc.) and processing (food additives, including artificial flavourings, preservatives and colourings) (First and Brozina, 2009, p. 186).

More confusion still exists as to what characterizes an organic wine and distinguishes it from wines produced with organic grapes (Fotopoulos *et al.*, 2003): “Wine made from organic grapes is wine made from grapes that have been grown without pesticides. Organic wine is also made with organic grapes but prohibits sulfite use in the wine-making process” (Delmas and Grant, 2010, p. 9). This differentiation is highly relevant because sulfites affect the wine quality by acting as a preservative what is of interest for organic oriented wine consumers as well as producers (Scampicchio *et al.*, 2008).

Although there is no common legal definition of organic food production, it can be stated that the term organic refers to the production process and not to the product itself (Zakowska-Biemans, 2011). It becomes evident, that an organic label assures low or zero use of chemically synthesized inputs, constitutes a signal for the absence of pesticide and veterinary drug residues and indicates low nitrate content (Bougherara and Combris, 2009). Nevertheless, it does not automatically mean that the product is healthier or tastier than its conventionally produced counterpart – actually, the organic label is still only a guarantee of a specific process (Bougherara and Combris, 2009).

However, consumers often associate organic food with an environmentally friendly agricultural production as well as certain intrinsic quality and safety characteristics (Vindigni *et al.*, 2002; Zakowska-Biemans, 2011; Brennan and Kuri, 2002). Looking for healthier food and being suspicious of conventional produced products, the new consumer orientation leads to a high demand for organic products so that even discounters offer organic products in large quantities and exceptionally low prices (Stolz *et al.*, 2010).

In this context, forecasts of annual growth rates for organic sales across the EU within the next years underline the increasing importance as such growth rates range from 1.5 per cent in Denmark to 11 per cent in the UK. Also the US retail sales of organic products increased rapidly in the 1990 s, averaging 20 per cent per year and are predicted to grow 9-16 per cent in the near future (Dimitri and Oberholtzer, 2005). With regard to the wine industry it seems quite difficult to estimate such a trend; however, there are all around the world more and more wineries which can be certified as organic (Remaud *et al.*, 2008). Hence, 90,696 vineyards worldwide were under organic management in 2004 whereby Italy and Austria, each with 3.4 per cent, hold the highest share of total vineyards in a country (Geier, 2006).

### *Consumer perception of organic food*

Since the organic food market started its rapid growing trend over the past decade, a vast amount of research has emerged on topics towards organic food consumption. Focusing on consumer demand for organic products, existing studies have investigated the role of personal values (i.e. Chryssohoidis and Krystallis, 2005; Baker *et al.*, 2004), attitudes and behaviour (i.e. Kim and Chung, 2011; Aertens *et al.*, 2009; Tsakiridou *et al.*, 2008; de Magistris and Garcia, 2008; Padel and Foster, 2005; Beharrell and MacFie, 1991) health- and environmentally-friendly behaviour (i.e. Chen, 2009; Magnusson *et al.*, 2003), risk and benefit perceptions in organic food behaviour (i.e. Saba and Messina, 2003), and demographic characteristics of organic food consumers (i.e. Lockie *et al.*, 2002; Thompson, 1998), cultural influences (i.e. First and

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Brozina, 2009) as well as price characteristics (i.e. Krystallis and Chryssohoidis, 2005; Soler *et al.*, 2002; Brennan and Kuri, 2002; Gil *et al.*, 2000).

Regarding the intention to buy organic food Hamzaoui Essoussi and Zahaf (2008) point out that consumers purchase organic food mainly for the following reasons: organic food is seen as healthier, more nutritious, fresher, and safer. As well, organic production implicates that no chemicals are used, and moreover, organic farming is kinder to the environment, and implies animal welfare. These motives for buying organic food are primarily related to quality aspects.

Concerning the taste of organic food Fillion and Arazi (2002) conducted a study which focused on the question if organic food tastes different and even better. Conventional and organic produced milk and orange juice were blind tasted, with the result that consumers adjudge organic orange juice a different and even better taste, whereas consumers were not able to make a difference with regard to milk. Nevertheless, even if the results of Fillion and Arazi (2002) showed that a better taste of organic food cannot invariably be approved, interestingly various studies identified taste as one of the main reasons for choosing organic food (Stolz *et al.*, 2010).

Even though the sensory perception plays a significant role in the acceptance of food Brennan and Kuri (2002) indicate that consumer's choice is strongly influenced by the perceived value for money. As mentioned in several studies many consumers denote that they have a preference for and an interest in organically produced products (Tsakiridou *et al.*, 2008) and therefore may be willing to pay premium prices for organic food. Gil *et al.* (2000) empirically confirmed this assumption and revealed no willingness to pay a premium for organic food products concerning unlikely consumers, whereas likely and actual organic food consumers were willing to pay a premium especially for meat, fruits, and vegetables.

#### *Consumer perception of organic wine*

More closely related to wine consumption, the literature provides a plethora of articles that aim to assume information about customers' characteristics and needs by investigating product attributes which are comprised in choice processes (Casini *et al.*, 2009). While typical marketing mix variables such as price or product quality are still of crucial interest, there has been little research on the impact of organic production although that aspect gains in importance for scientists as well as for practitioners (Balestrini and Gamble, 2006; Forbes *et al.*, 2009).

With the attempt to offer more insights into the organic wine market, Fotopoulos *et al.* (2003) compared Greek buyers versus non-buyers of organic wine by using a qualitative sample and applying means-end chains analysis. Across all consumer groups healthiness, quality, information, attractiveness and good health are the main motivational benefits of wine purchases. Fotopoulos *et al.* (2003) also show that buyers and non-buyers of organic wines mainly differ in the evaluation of the said motivational benefits but not in the motives themselves. Most recently Barber *et al.* (2009) investigated in the US market to what extent environmental knowledge and attitudes influence the willingness to purchase organic wine. Among other aspects they found that consumers' positive evaluation of organic wine is mainly associated with their involvement in environmental issues. Moreover, Barber *et al.* (2009) confirmed that Americans were willing to pay more for environmentally friendly wine though many consumers did not have the skills to value the more complex sensory quality.

In this context Forbes *et al.* (2009) showed by means of their in New Zealand conducted study that rate the quality of “green wine” equal or better than conventionally produced wine. Furthermore Forbes *et al.* (2009) discovered that consumers are willing to pay a higher price for organic produced wine whereby they confirmed previous findings. Thus Brugarolas Mollá-Bauzá *et al.* (2005) discovered four years earlier that consumers are willing to pay higher prices for organic wine (between 16.29 per cent and 16.92 per cent). To obtain more detailed results Brugarolas Mollá-Bauzá *et al.* (2005) carried out a survey on 400 wine consumers from Alicante (Spain) and used a contingent valuation to determine that especially health oriented respondents’ price premium is between 20.9 per cent and a 22.55 per cent.

Based on the presented literature which focuses the organic food and beverage market in general and the wine market in particular, the focal research questions of this study are as follows:

- RQ1. Does the stimulus “organic food” influence the perception of a given wine?
- RQ2. Is the positive perception of organic wine reflected in the sensory evaluation?
- RQ3. Does the cue “organic” lead to the willingness to pay a price premium?
- RQ4. Is there any association between positive attitudes towards organic foods in general and the perception and evaluation of the given wines?

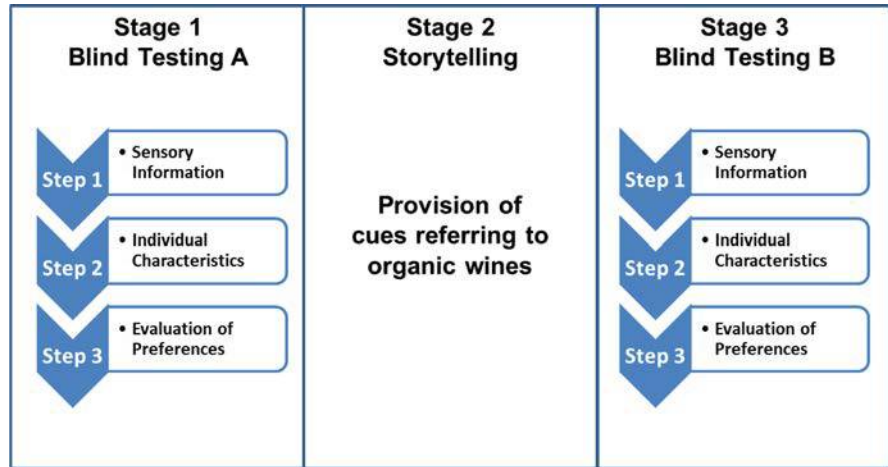
## Methodology and research design

### *Experimental design*

For the purposes of our study focusing on the consumer perception and evaluation of conventional versus organic wine, we decided to use an experimental design with a blind taste test procedure. Our prediction was that subjects would rank a wine described as organic higher than a conventional wine – even if there is no objective difference. Consumer perceptions and attitudes toward the wines were assessed using a questionnaire including *wine preference*, *buying and recommendation intention*, and *willingness to pay*. Besides, *consumer wine knowledge* and *consumer personal environmental orientation* were measured as individual constructs.

Given that blind tasting is a typical methodological approach in the context of food and beverage marketing, our experimental design relies on existing studies in the field of wine marketing (e.g. Ballester *et al.*, 2005; Lecocq *et al.*, 2005; Masson *et al.*, 2008; Parr *et al.*, 2003; Solomon, 1997; Wansink, 2006). Particularly, our blind tests were designed to measure the extent to which the “organic” status brings bias into the sensory perception and evaluation of the given wines. In accordance with well-established procedures in the field of blind experiments in wine marketing research like, e.g. Masson *et al.* (2008), our experimental design comprises three stages as illustrated in Figure 1.

In stage 1, we started with the blind test of the red wine presented as “conventional”. Based on the sensory information, the participants rated this wine. In stage 2, in a storytelling approach, we presented some cues referring to organic wines. It was explained to the participants that organic viniculture stands for healthy, safe, and environmentally friendly products without any qualitative disadvantages. Next, in



**Figure 1.**  
The three-stage  
experimental design

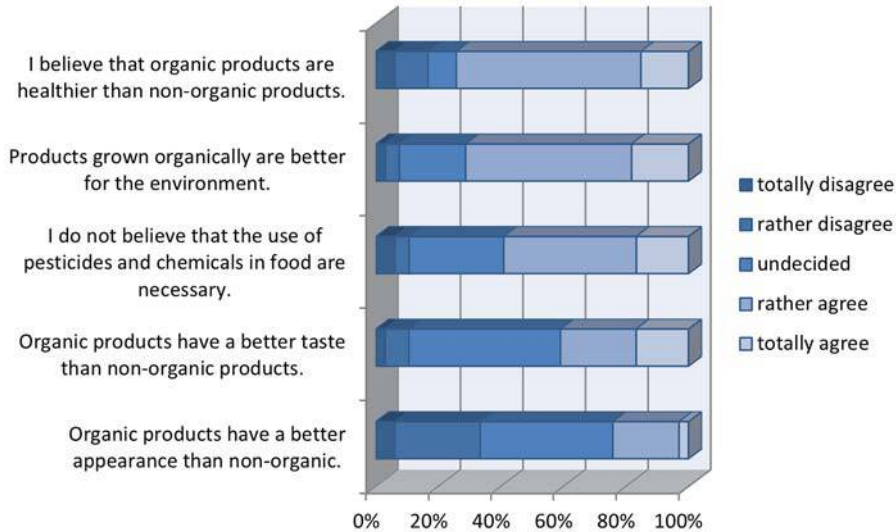
stage 3, the participants tasted and evaluated in a blind test the second wine presented as “organic” though it was exactly the same wine, we offered in stage 1.

#### *Blind test procedure*

The wine tested was a Cimarosa Shiraz 2009 (South Eastern Australia). Samples were allocated in small odour-free glasses with appropriate and constant temperature. The experiment was carried out in Germany in April 2011. After fully disclosing the aim of the experiment – to evaluate the taste of conventional and organic wine – 66 subjects volunteered. Participants were male and female adults between the ages of 21 and 58 and are regular wine consumers but cannot be considered as wine experts. The wines were presented to the participants with bread and table water. In order to avoid misleading results, in both stages the wine was handed in plane glasses. For the same reason, the storytelling approach was limited to the given cue of tasting an organic wine, whereas there were no further positive or negative insults as concerning the accumulation of copper, sulfur (etc.). Hence, the participants believed that they tasted one conventional wine and one organic wine although it was always the before mentioned Cimarosa Shiraz 2009 (*ceteris paribus*). The identity of the samples was as follows: Blind Testing A: red wine presented as conventional. Blind Testing B: red wine presented as organic. All participants were asked to evaluate the wines separately on our questionnaire.

#### **Results and discussion**

With reference to consumer perceptions and attitudes towards organic foods in general (cf. Figure 2), our results reveal that 74.3 per cent of the participants in our study believed that organic food is healthier than conventional products. Besides, 71.2 per cent thought that growing food organically is better for the environment, relating to the use of pesticides and chemicals in food, 59.1 per cent state that they do not believe that the use of pesticides and chemicals in food are necessary. Even if 48.5 per cent of the consumers are undecided if organic products have a better taste than non-organic products, another 40.9 per cent clearly state that they can distinguish organic food by



**Figure 2.** Consumer perceptions and attitudes towards organic foods

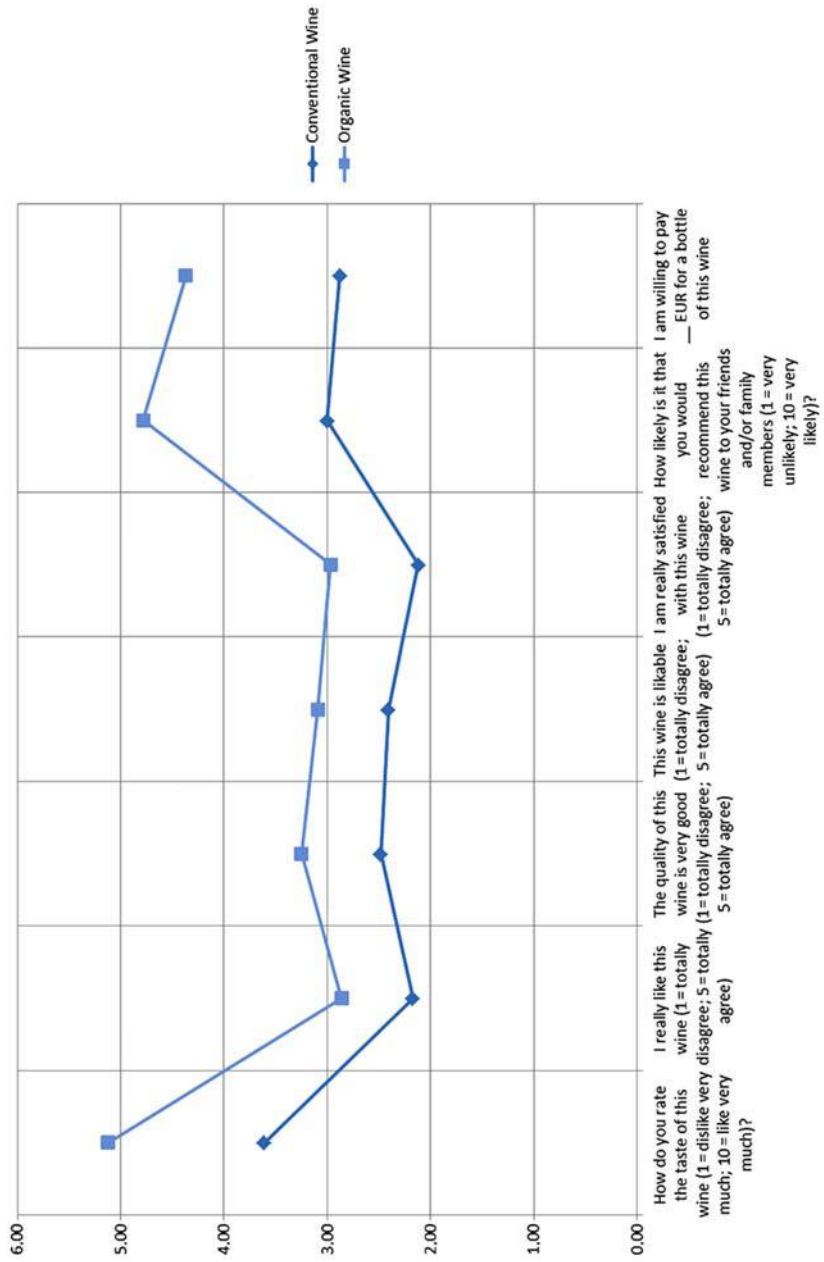
taste. Referring to the appearance of conventional versus organic products, the consumers in our study are undecided (42.4 per cent).

As illustrated in Table I and Figure 3, the results of the respondents' evaluation of the red wine presented as conventional differed significantly from the evaluation of the red wine presented as organic referring to a wide variety of factors. Even if they were

	Mean "conventional"	SD	Mean "organic"	SD	F	Sig.
How do you rate the taste of this wine (1 = dislike very much; 10 = like very much)?	3.61	2.47	5.12	2.64	11.30	0.00
I really like this wine (1 = totally disagree; 5 = totally agree)	2.17	1.18	2.86	1.20	11.02	0.00
The quality of this wine is very good (1 = totally disagree; 5 = totally agree)	2.48	1.00	3.25	1.05	18.33	0.00
This wine is likable (1 = totally disagree; 5 = totally agree)	2.41	1.04	3.09	1.11	13.15	0.00
I am really satisfied with this wine (1 = totally disagree; 5 = totally agree)	2.12	1.14	2.97	1.20	16.94	0.00
How likely is it that you would recommend this wine to your friends and/or family members (1 = very unlikely; 10 = very likely)?	3.00	2.61	4.78	2.66	14.94	0.00
I am willing to pay __ EUR for a bottle of this wine	2.88	1.91	4.37	2.58	12.90	0.00

**Table I.** Comparison of means and standard deviation





**Figure 3.** Comparison of the evaluation of the conventional and the organic wine

given similar wine samples, in all aspects, the participants rated the “organic wine” significantly higher than the “conventional one”. The highest mean differences were shown in the context of taste, recommendation behaviour and the willingness to pay a higher price.

In a paired comparison as presented in Table II and Figure 4, there was no significant association between a positive attitude towards organic foods in general and the perception and evaluation of the given wines. Hence, even if they do differ in their general evaluation of organic food products, all respondents rated the “organic wine” more favourably. Even if not significant, the highest difference in the comparison between the mean ratings was revealed in the willingness to pay: For the “organic wine”, respondents who have no general positive perception of organic foods were willing to pay on average more than 1 EUR per bottle than those participants who have a general positive perception of organic foods. Thus, the cue “organic” seems to be highly associated with higher costs but also higher quality in the eyes of this customer group.

In sum, in accordance with existing research insights, consumers tend to prefer organic products over conventional ones. In this context, our experiment shows that adding information on the product’s process during a blind test leads consumers to increase their ratings in favour of the “organic wine”. Interesting is, that consumers even give a better rating for “conventional wine” just described as being “organic” indicating that the appearance and taste are perceived to be better and the price intention is higher – thus, we have a pure label effect.

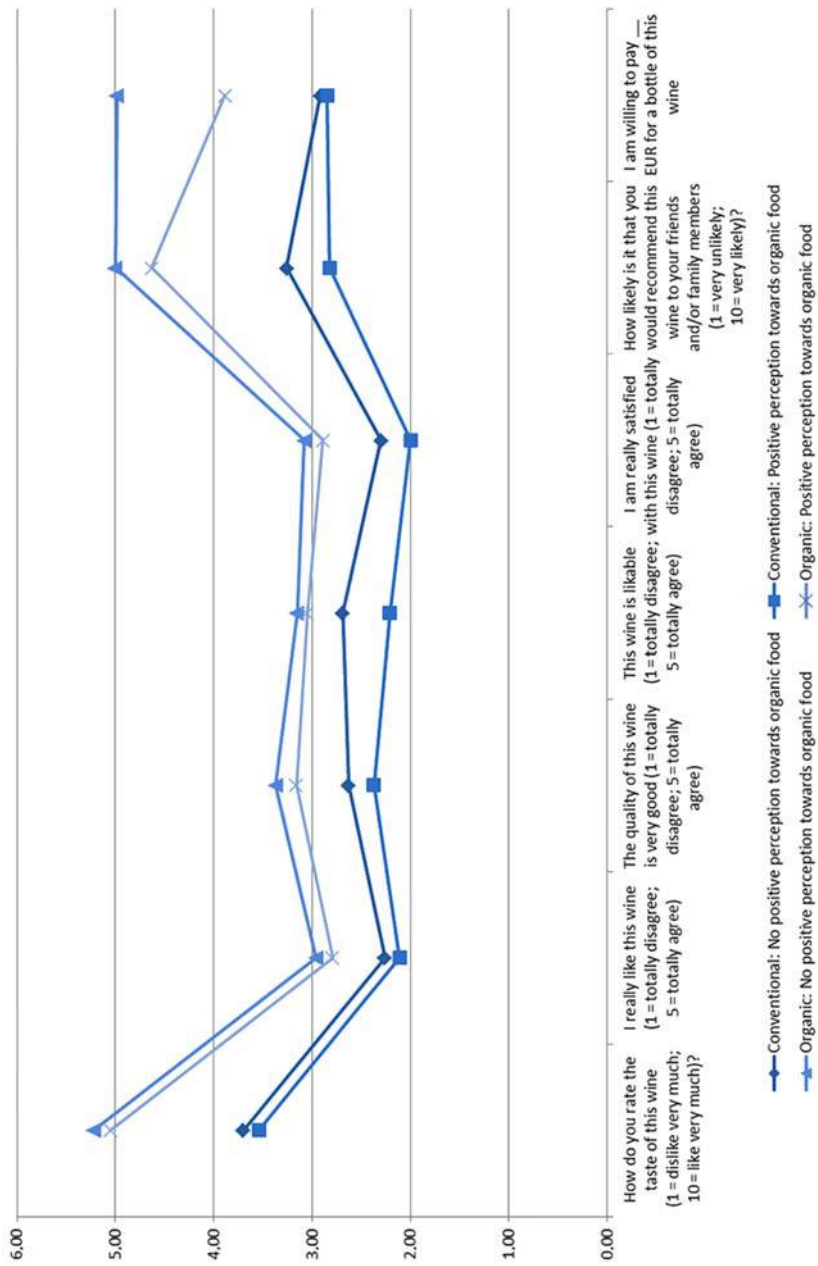
## Conclusion

Existing research shows that the image of organic products has a strong effect on consumer attitudes and product perception: The so-called halo or blurring effect can modify the sensory perception of products in terms of a positive outcome for organic food. To test this phenomenon in a wine experiment setting, the aim of the present study was to apply a blind test with these main research goals: first, to ascertain if the stimulus “organic food”, placed by storytelling, influences the perception of a wine. Second, we tried to discover wherein a positive perception of organic wine might be reflected (e.g. willingness to pay, better taste perception). Third, we assessed if there is a significant association between positive attitudes towards organic foods in general and the perception and evaluation of the given wines.

The key finding of our survey was that even if they tasted the identical product, our respondents ascribe a significantly better taste to the “organic” wine compared to the conventional alternative. Besides, the willingness to recommend the organic wine as well as the willingness to pay a higher price differed significantly from the evaluation of the red wine presented as “conventional”. With reference to a possible relation between a positive attitude towards organic foods in general and the perception and evaluation of the given wines, our results revealed no significant differences. Consequently, regardless of their knowledge and attitude towards organic products in general, all respondents rated the so-called organic wine higher in all given attributes. This strong effect might be moderated by the fact that in all European countries, Germans are currently the heaviest consumers of organic food. The rising awareness and interest in organic products has been stimulated by a growing interest in the environment, individual health and the rise in the number of food scandals. In

**Table II.**  
Paired comparison of  
means and standard  
deviation

	Conventional wine				Organic wine					
	No positive perception towards organic food Mean SD	No positive perception towards organic food Mean SD	Positive perception towards organic food Mean SD	ANOVA <i>F</i> Sig.	No positive perception towards organic food Mean SD	No positive perception towards organic food Mean SD	Positive perception towards organic food Mean SD	ANOVA <i>F</i> Sig.		
How do you rate the taste of this wine (1 = dislike very much; 10 = like very much)?	3.70	2.70	3.54	2.32	0.07	0.80	5.05	2.79	0.06	0.80
I really like this wine (1 = totally disagree; 5 = totally agree)	2.26	1.23	2.11	1.16	0.27	0.61	2.79	1.21	0.33	0.57
The quality of this wine is very good (1 = totally disagree; 5 = totally agree)	2.63	1.04	2.37	0.97	1.08	0.30	3.16	1.05	0.65	0.42
This wine is likable (1 = totally disagree; 5 = totally agree)	2.69	1.09	2.21	0.96	3.48	0.07	3.05	1.23	0.13	0.72
I am really satisfied with this wine (1 = totally disagree; 5 = totally agree)	2.30	1.20	2.00	1.09	1.07	0.31	2.89	1.25	0.36	0.55
How likely is it that you would recommend this wine to your friends and/or family members (1 = very unlikely; 10 = very likely)?	3.26	2.89	2.82	2.42	0.45	0.50	4.63	2.80	0.30	0.59
I am willing to pay ___ EUR for a bottle of this wine	2.92	2.28	2.85	1.59	0.02	0.89	3.88	1.87	2.82	0.10



**Figure 4.** Paired comparison of the evaluation of the conventional and the organic wine

accordance with existing research insights, our study gives evidence that especially when consumers' objective knowledge in a certain product category like wine is low, extrinsic cues like the label indicating organic production are more influential.

The results of our study clearly need to be considered in the light of its research limitations. Apart from the size of the sample group of respondents, the dynamics of our three-stage experimental design may have created a bias explaining a more favourable score with regard to the wine presented as organic based on our storytelling approach. This may have created stronger expectations than the mere "conventional wine" cue. Further research needs to be carried out in tests using a double-blind laboratory experimental design with a conventional and a "real" organic brand as a reference wine and different groups of consumers (e.g. different countries, cultural backgrounds and levels of wine expertise). However, the main focus of our study was on the assessment of the pure signalling effect by referring to the auditory stimulus "organic", not the obvious difference in the products. Our insights highlight the overwhelming effect of the presentation of the wine as organic on all attributes of perceived quality, recommendation behaviour, and the willingness to pay a price premium. Consequently, the production of wine plays an important role in overall consumer perception. Hence, wine growers and wine retailers should highlight this factor in their marketing strategies as the consumer demand for eco-friendly products has rapidly increased.

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