

Virtual store Vs Laboratory store: is there a better way to evaluate consumers' sustainable choice of wine?

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Very Preliminary Version – Work in progress

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This study is part of VINPEST - "An experimental investigation of the willingness to produce environmentally friendly wine", an Integrated Project financed by the Ministry of Ecology, Sustainable Development and Energy (MEDDE).

Introduction

The French program “Ecophyto 2018” aims at achieving a 50% reduction in pesticide use by 2018. The vine-growing sector, being the second largest user of pesticides in France, so there is a strong need for French vine-growers to engage in more environmentally sustainable practices. However, they will do only if they are sure that consumers are ready to buy environmentally friendly wines. It is necessary to better understand consumers’ choice criteria and the potential impact of an information campaign, In order to develop successful environmentally sustainable policies that help consumers to change their consumption patterns.

Results of our previous qualitative exploratory study, focused on the perception of a series of logos on environmental sustainability in wine production by Burgundy wine consumers show that the large number of different logos on environmental sustainability available in the French market has created confusion among consumers and probably contributed to the reduced credibility for several of them, and indicate the need for further research on this subject. Since consumers cannot directly evaluate environmental sustainability by themselves, and are only able to choose to purchase environmental sustainable wine once they are provided with accurate, understandable and trustable information, there is urgent need for those organisations owning a labelling scheme related to environmental sustainability in wine production to improve their design information and communication strategies.

Material and Method

Experimental Design

In order to develop successful environmentally sustainable policies that help consumers to change their consumption patterns, it is necessary to better understand consumers’ choice criteria and the potential impact of an information campaign. As hypothetical methods are often criticized an experiment was conducted in two experimental stores (a physical experimental store and a virtual store). This option makes it possible to control the range of proposed wines and their prices and thus to study the impact of production process, price on purchase and to evaluate the impact of information on consumer purchasing behaviour.

About three hundred and twenty four wine consumers aged between 20 and 71 years old from Dijon area (France) participated in the study. Recruitment criteria included men and women who purchased and consumed red wine at least twice a month. Participants accepted to come at INRA building in order to choose and buy a bottle of wine in an experimental store.

The study was conducted in two stages. Initially, a laboratory shop has been installed. 223 participants came to this experimental store. Each consumer came twice, at three weeks intervals, in the experimental store to buy one bottle of wine among the proposed offer. Consumers were presented with 11 wine alternatives varying according to three price levels corresponding to the market price range (4.50; 7.40 and 11.30) and four levels of environmentally friendly process (conventional, integrated, organic, biodynamic agriculture). The chosen wine was recorded for each consumer at each session and the time spent to make the choice. After their choice consumers really paid the wine bottle. After the first session, consumers were split into two groups: Non-Informed (G1, n=72) and Informed (G2,

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n=141). The groups were randomly formed. Informed group received at home a brochure containing information about sustainable production processes and associated logos. During the second session, consumers chose and really paid for another bottle of wine as in their first session. After this first step consumers took part at an incentive compatible method to reveal their risk aversion behaviour. This tool was used to characterize risk aversion of the participants in order to understand if this individual characteristic was correlated with their attitude and behaviour towards an environmental purchase. To characterize consumers' risk attitude, we used both declarative and incentive methods. We used Holt and Laury (2002) lottery in the incentive framework and the survey developed by Dohmen et al. (2011). At the end of the second session consumers answered to different questions about their choice criteria, wine consumption and purchase behaviour, perception of information, wine knowledge and socio-economic characteristics.

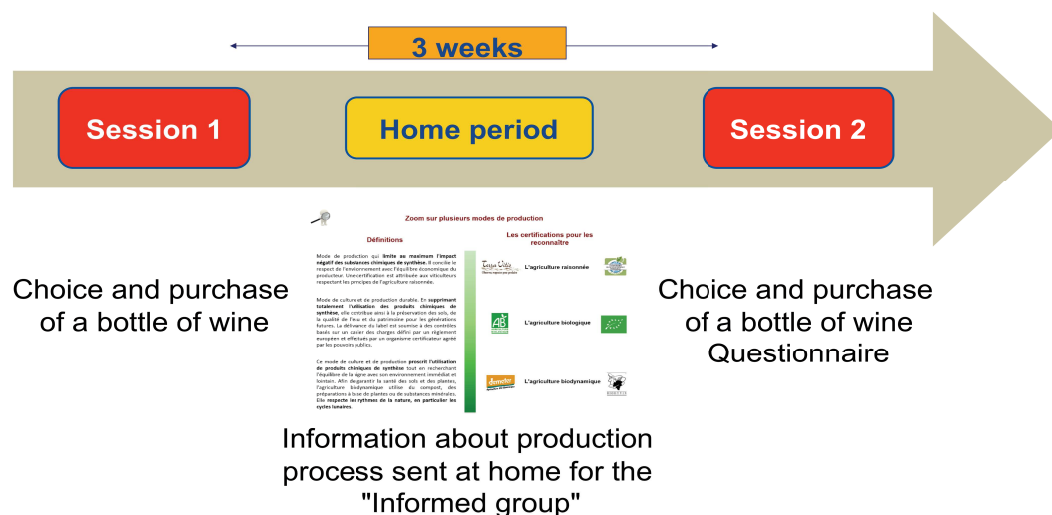


Figure 1 Experimental procedure of the experimental store

The analysis of the first results showed a high willingness to buy for the biodynamic wine. Given that this preference does not arise so clearly in the reality, we worried about the impact of the aesthetics of the labels. Unfortunately, it was not possible to differentiate in the laboratory shop (with real bottles) the impact of the aesthetics of the label and the impact of the environmental certification (because both of them are printed in the label). So to control the “aesthetic effect”, we ran another experiment with exactly the same wines but in a “virtual shop”.

One hundred eleven participants accepted to come in our online experimental store to buy a bottle of wine. Each consumer of these 111 consumers had to choose a bottle of wine among eleven in three successive informational conditions. In the first informational condition, all the information about environmental labels was erased (infeasible with real bottle but easy with a photo editing software), consumers had to choose as if all the proposed wines were not differentiated on the environmental point of view. In the second condition, the sustainable labels were introduced, and consumers had to choose among the eleven wines with the information on environmental labels. After this choice, information about the different types of production and associated logos was given to the participants. Given this information, participants have to choose again a wine among the eleven wines. At the end of the session, one wine (among the three chosen wines) was randomly drawn and

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bought by the participant. At the end of the experiment the same questionnaire that in the laboratory shop had been completed.

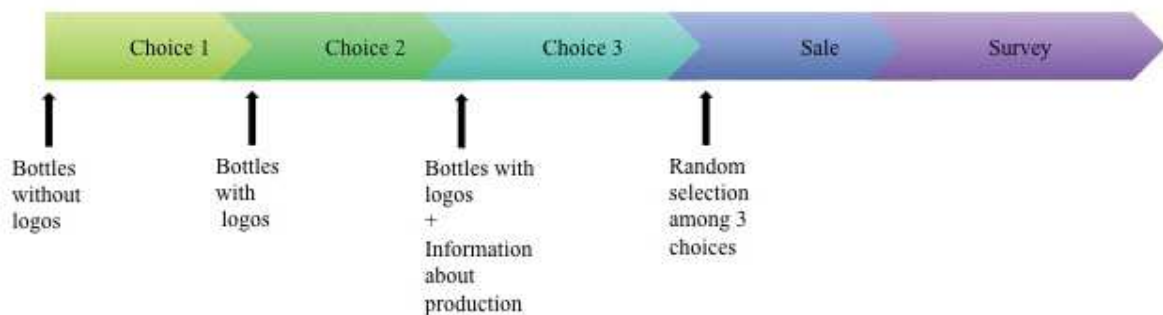


Figure 2 Experimental procedure in the virtual shop

Selection of choice attributes and levels

During choice experiment, participants choose from a range of products that are characterized by specific attributes. During our study, subjects have to choose (and buy) one bottle of wine among eleven, according to two main attributes.

The first tested attributes dealing with the pesticide use restriction, basically four pesticide use restriction levels were introduced. The second tested attribute concerning the price range. Table 1 shows levels of each attribute.

Attributes	Attribute levels	Information
Pesticides restriction use	No restriction	No label
	Sustainable practices with reduced use of pesticides	Integrated label (IPM)
	Ban of chemical pesticides	Organic
	Ban of chemical pesticides + other practices	Biodynamic
Prices	Low price level	4.50 €
	Medium price level	7.40 €
	High price level	11.30 €

Table 1 Attributes and levels

We consider the pesticide reduction level as an increasing constraint according to the labels. The conventional wine, with no quality label, answers to the regulatory constraint on wine production in vigour. Integrated wine, with a sustainable label, is produced with a reduced pesticide use. The organic wine, with an organic label, is produced under the European regulatory constraints on pesticide restrictions (ban of chemical pesticides) production methods restrictions both necessary to obtain the certification. The biodynamic wine is produced with ban of chemical pesticides as well as constraints linked to respect with nature's cycles. We consider here that conventional wine is the least constraining production method and that biodynamic is the most constraining production method.

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The second attribute variation for the wines is the price range. We decided to propose three ranges of prices to consumers. All the wines in each price range were given different pesticide reduction level labelling this meant that consumers had both choice of price and choice of pesticide level (except the integrated wine in the high price level because we didn't find any corresponding wine). We didn't allow an intra-range price differentiation. The reason why is because beliefs on the organic wines by consumers are quite heterogeneous. Some surveys show that some consumers negatively perceive the organic wines. Some consumers expect a negative sensory attribute of the organic wines. So we wanted to test how, in the best possible configuration without price differentiation, the market shares were going to divide up.








	Price		Price range 1]0€;5€]	Price range 2]5€;10€]	Price range 3]10€;15€]
	Production type				
Less sustainable ↓	Conventional		P11	P21	P31
	Integrated		P12	P22	N/A*
	Organic		P13	P23	P33
More sustainable ↓	Biodynamic		P14	P24	P34
	Posted price (€)		4.50	7.4	11.3

Table 2 Selected products according to attribute levels

All the selected wines were produced in the same geographical area and were labelled by a “Cotes du Rhône” Protected origin. Given participants have been selected in the Dijon area, we have chosen a non Burgundy PDO (Protected Denomination of Origin) in order i) to propose non usual wines for the consumers ii) to avoid reputation effects (more precisely we wanted to avoid specific beliefs on domains or vintners).

Data and Results

Sample characteristics

The sample characteristics are described in table 3. It seems that the lab shop sample and the virtual shop sample are quite similar in socio-demographic point of view.

Characteritics	Classification	Sample (%) Lab Shop	Sample(%) Virtual Shop
Sex	Female	50.70%	52.25%
	Male	49.30%	47.75%
Position	Student	4.23%	4.55%
	Unemployed	7.51%	4.55%
	Full-time worker	54.93%	55.45%
	Part-time worker	12.21%	11.82%
	Retired	19.71%	21.82%
Age	less than 25	4.69%	9.91%
	[25;35[26.29%	22.52%
	[35;45[23.00%	24.32%
	[45;55[16.90%	13.51%
	[55;65[21.60%	18.92%
	65 and more	7.51%	10.81%

Table 3 socio-demographic characteristics of the sample

Impact of product characteristics (production type and price) on probability to choose a wine

Descriptive statistics

	Lab Shop (informed and non informed)		Virtual Shop		
	Choice 1	Choice 2	Choice 1	Choice 2	Choice 3
Production					
Conv	23%	17.84%	51.3%	18.1%	12.9%
Integrated	17.84%	18.31%	15.3%	22.9%	21.8%
Organic	15.02%	22.07%	12.6%	20%	16.8%
Biodynamic	44.13%	41.78%	20.6%	39.1%	48.5%
Price Range					
Low Price (4.5)	47.42%	62.44%	36%	30.6%	33.3%
Medium Price (7.4)	46.48%	30.99%	44.1%	58.6%	47.8%
High Price (11.3)	6.10%	6.57%	19.8%	10.8%	18.9%

Table 4 % to choose a wine according to production method and according to price range

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The impacts of product characteristics on probability to choose a wine was estimated by using a random parameter logit. Each production type was compared to the conventional method. The two highest prices were compared to the lowest one.

Impact on information seems to be strengthened in the lab shop experiment (see figures 3 and 4).

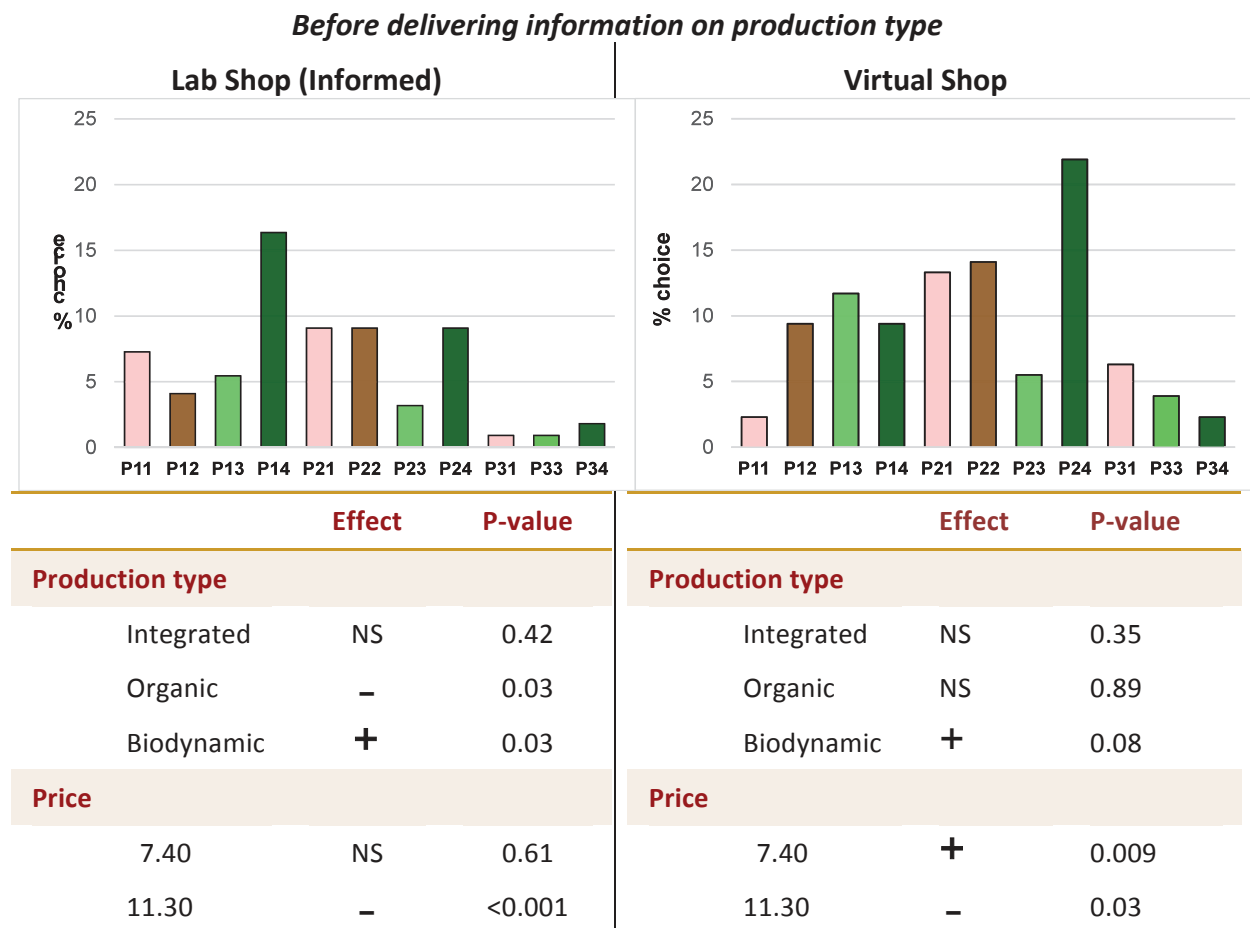
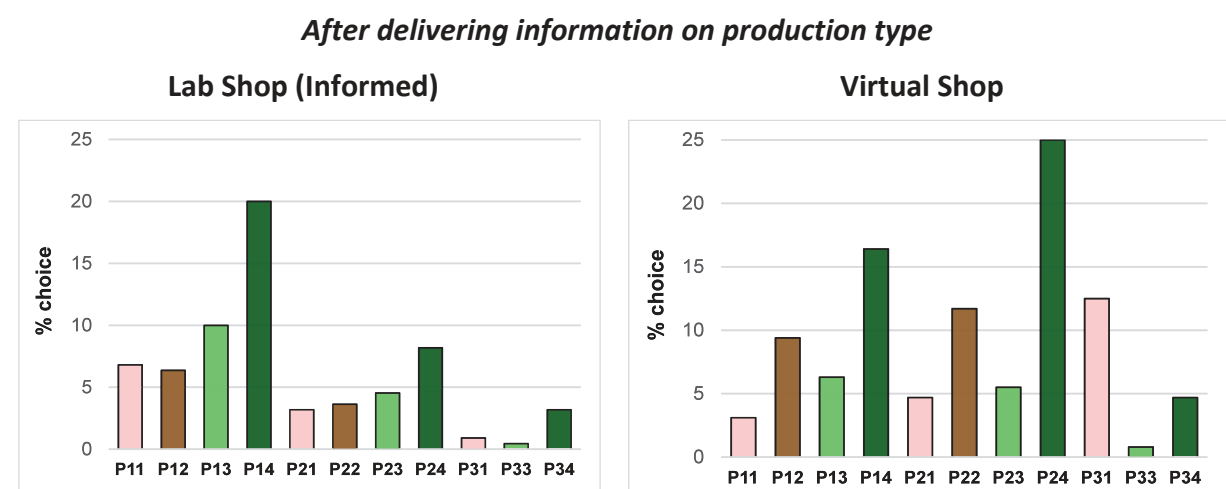


Figure 3 histograms of frequencies to choose a wine before information on production types



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	Effect	P-value		Effect	P-value
Production type			Production type		
Integrated	NS	0.99	Integrated	NS	0.29
Organic	NS	0.24	Organic	NS	0.13
Biodynamic	+	<0.001	Biodynamic	+	0.001
Price			Price		
7.40	-	<0.001	7.40	NS	0.15
11.30	-	<0.001	11.30	NS	0.16

Figure 4 histograms of frequencies to choose a wine after information on production types

Data will be analysed with a statistical model to explain choices according to price and production process, to examine the impact of information as well as the impact of individual characteristics. By comparing choices between the two sessions for each laboratory consumer, it will be possible to test the persistence of choice in time and evaluate if the information on production process had an impact on purchasing behaviour. The comparison of the first informational context and the second informational context allows us to evaluate the impact of the “aesthetic effect”.

	Lab shop	Virtual Shop
Integrated	57	46
Organic	20	16
Biodynamic	78	66

Table 5 Consumers' knowledge about sustainable wine production types - % of consumers declaring that they did not know each production type previously to the experiment

Conclusion

The first results show that consumers appeared not well informed about the different types of environmentally sustainable production for wines. Nevertheless, consumers are willing to buy “biodynamic wines” when these wines are sold at the same price that the conventional wines. It appears that information delivered about wine production methods had some effect. Information increased the probability to choose a “biodynamic” wine in comparison to a “conventional” one. In the lab shop condition, the probability to choose an “organic” wine in comparison to a “conventional” one decreased with information. In the virtual shop condition, information had a negative impact on ‘conventional’ wines rather than a real positive impact on the environmentally friendly wines. So Both methods gave quite similar results regarding the effect but the virtual shop condition revealed less negative effect of price. These on-going results will be improved and completed in order to be presented during the conference.

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