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Article

A GENDER APPROACH TO WINE INNOVATION AND ORGANIC WINE PREFERENCES

UMA ABORDAGEM DE GÉNERO PARA A INOVAÇÃO DO VINHO E AS PREFERÊNCIAS DO VINHO ORGÂNICO

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SUMMARY

The development of innovative products, such as novel wines, is rejected by certain consumers that value attributes that may conflict with innovation. This is the case of the organic production label. The present study examined the impact of gender on wine purchasing preferences for innovative and organic wines. The findings showed that price is the most important attribute for both men and women when buying wine. The results also revealed that women assign greater importance to the production system (organic/conventional) than men. The segmentation generated according to the level of wine neophobia revealed significant differences between men and women in the frequency of wine consumption and the socioeconomic variables considered (age, educational level and income). The level of wine neophobia was higher in women than in men, but, in both genders, it increased with age and decreased as income and educational level increased. Women's lesser interest in innovative wines and their more positive attitude towards organic wines encourages the consideration of women as a segment in which tradition and naturalness related to wine should be specifically taking into account.

RESUMO

O desenvolvimento de produtos inovadores, designadamente novos vinhos, é rejeitado por alguns consumidores que valorizam atributos que podem entrar em conflito com a inovação. É o caso do selo de produção orgânica. O presente estudo avaliou o impacto do género nas preferências de compra de vinhos inovadores e orgânicos. Os resultados mostram que o preço é o atributo mais importante para homens e mulheres na compra de vinho. Os resultados também mostraram que as mulheres atribuem maior importância ao sistema de produção (orgânico/convencional) do que os homens. A divisão gerada de acordo com o nível de neofobia relativamente ao vinho revelou diferenças significativas entre homens e mulheres na frequência de consumo de vinho e nas variáveis socioeconómicas (idade, nível educacional e rendimento). O nível de neofobia relativamente ao vinho revelou-se mais elevado nas mulheres do que nos homens, mas, em ambos os géneros, aumentou com a idade e diminuiu com o aumento do rendimento e do nível educacional. O menor interesse das mulheres por vinhos inovadores e a sua atitude mais positiva em relação aos vinhos orgânicos estimula a consideração das mulheres como um segmento em que a tradição e a naturalidade do vinho devem ser especificamente ponderadas.

Keywords: Consumer behavior, organic wine, wine neophobia scale (WNS), women, men.
Palavras-chave: Comportamento do consumidor, vinho orgânico, escala de neofobia ao vinho (WNS), mulheres, homens.

INTRODUCTION

Although the wine market has conventionally been linked to tradition, the increasingly competitive market (OIV, 2019) has encouraged companies to constantly improve their existing products or even develop radical innovations (Rabadán, 2021). These innovations range from the addition of new ingredients (Nguyen *et al.*, 2019) to changes in the production process (Cebrián-Tarancón *et al.*, 2019; Rabadán, 2021). Although it can no longer be considered a "new to the market" innovation (OECD, 2018), one of the most important and wide-spread innovations in the wine sector in recent years has been the production of organic wines (Rabadán and Bernabéu, 2021b). However, the limited acceptance of organic wine among consumers and the need to develop future

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innovations encourages the evaluation of innovation in traditional agri-food products considering consumers' perceptions (Galanakis, 2019).

Wine is considered a traditional product; the quality of which greatly depends on the place and the production process (Pretorius, 2020). In addition, the real quality of wine can only be perceived once consumed (Ristic *et al.*, 2016), and thus multiple emotional, social and cultural attributes typically come into play in the purchasing decision process (Lockshin and Corsi, 2012; Bernabéu *et al.*, 2013; Niimi *et al.*, 2019). Previous research showed that consumers' preferences for wine purchasing are formed according to certain extrinsic attributes of the product, of which the most noteworthy are place of origin (De-Magistris *et al.*, 2015), type of wine (Rossetto and Galletto, 2019), price (Mann *et al.*, 2012; Remaud and Forbes, 2012), production system (Mauracher *et al.*, 2019; Janssen *et al.*, 2020), label design (Pelet *et al.*, 2020) and prizes awarded (Ferreira *et al.*, 2019).

Regarding the organic attribute, in the case of wine, several studies have shown that some consumer segments are clearly willing to pay higher price for more naturally produced wines (Galati *et al.*, 2019; Migliore *et al.*, 2020). Pomarici *et al.* (2016) found a segment of Italian consumers (32% of the sample) that was highly interested in environmentally friendly wines. In a cross-country survey conducted in Sweden, the UK, Ireland and the USA, Loose and Lockshin (2013) found a similar size segment of consumers interested in sustainable wines. In this regard, studies confirmed that consumers prefer organic over conventional wine (Bernabéu *et al.*, 2008; Mann *et al.*, 2012), and are also ready to pay more for these kinds of wine (Brugarolas *et al.*, 2010). However, the Willingness To Pay (WTP) reported may be overestimated, given that an attitude-behaviour gap has been suggested (Schäufele and Hamm, 2017). Attitude-behaviour gap appears when consumers exhibit positive attitudes towards organic wines but fail to translate those attitudes into a higher WTP for these wines. Additionally, when the production system (organic/conventional) is compared with other attributes, the positive attitude towards the organic label is found to be marginal. The study of Mann *et al.* (2012) reported that Swiss consumers value the organic attribute more than the colour of wine, but less than the price and the origin. Similar results were obtained by Remaud *et al.*, (2008), who found that the average Australian consumer cares little about the organic attribute when purchasing wine. Although consumers generally consider organic products to be healthier (Bonn *et al.*, 2016) and having improved sensory characteristics (Wiedmann *et al.*, 2014) the demand for organic wine is still below 10% compared to total wine sales in all countries (Schäufele and Hamm, 2018), and the organic label remains one of the least valued attributes when purchasing wine.

One of the main advantages of organic products is that they are perceived as more natural (Yormirzoev *et al.*, 2021). The concept of "more natural wine" is not easily defined, but can, in some cases, conflict with wine innovation, as even slight modifications in the production process can make wines be perceived as more artificial products (Saltman *et al.*, 2017; Nguyen *et al.*, 2019; Nguyen *et al.*, 2020). For this reason, higher level of rejection of innovative wines is expected from consumers that show more positive attitudes towards organic wine production (Rabadán and Bernabéu, 2021b).

It is now generally accepted that new product development should focus on the consumer (Grunert *et al.*, 2008). Thus, developing new or improved wines should draw on the analysis of consumer preferences, a process of which consumers must necessarily form part (Grunert *et al.*, 2010). The starting premise will always be the consumers' level of acceptance of such proposed innovations. Consumers' reluctance to try or to enjoy the consumption of new food products has been labelled food neophobia. This concept has been the topic of extensive research, leading to the development of several instruments to measure the phenomenon. The most widely accepted of the proposed measures is the Food Neophobia Scale (FNS) (Pliner and Hobden, 1992; Damsbo-Svendsen *et al.*, 2017). Following the success of the FNS, Ristic *et al.* (2016) developed a version specifically adapted to the analysis of consumers' neophobia towards new wines: the Wine Neophobia Scale (WNS). This scale is useful to evaluate consumers attitudes towards unknown wines, but it could also be used to evaluate consumer attitudes towards wines that are novel or innovative and, therefore, unknown to consumers. This scale has been validated in wine consumers in Australia (Ristic *et al.*, 2016) and Italy (Castellini and Samoggia, 2018), among others, and has emerged as the primary tool to analyse consumers' willingness to consume new wines.

The analysis of consumer profiles in relation to their food neophobia scores is an area that has generated the greatest interest (Rabadán and Bernabéu, 2021b). Ristic *et al.* (2016) and Meiselman *et al.* (2010) showed that wine neophobia increased with age, while decreasing with increasing education. Nguyen *et al.* (2019), however, found no association between these socioeconomic variables and wine neophobia. One of the fields in which most studies have been conducted, but where no compelling conclusions have been reached, is the relationship between food neophobia and gender (Rabadán and Bernabéu, 2021b). The study by Nordin *et al.* (2004), points towards food aversions being more frequent in women, while other studies conclude that men are more food neophobic than women (Hursti and Sjödén, 1997; Tuorila *et al.*, 2001; Tonon *et al.*, 2019). A third group of studies report no significant gender-related differences in neophobia (Fernández-Ruiz *et al.*, 2013; Nguyen *et al.*, 2019).

Several studies have also assessed the influence of gender in sustainable agriculture practices (Trauger, 2004) as well as in food consumption (Little *et al.*, 2009). In this regard, Morrison *et al.*, (2011) found that women consume 50% less food than men. However, they consume 30% more fruit and vegetables. The positive effect of environmental awareness and health awareness on the purchase of organic foods (Olivas and Bernabeu, 2012; Kesse-Guyot *et al.*, 2013; Irianto, 2015) explains why consumers of organic foods have typically been identified as women (Pearson *et al.*, 2010). Similar results have been reported by studies evaluating the impact of gender on attitudes towards more sustainable wines (Pomarici *et al.*, 2016; Sellers, 2016). Although direct recommendations have been made in the literature for producers to use gender as a crucial variable in the promotion of organic foods (Irianto, 2015), this strategy has not been widely used for the wine industry. In the study of Lockie *et al.* (2002), the authors explain that positive attitudes towards organic foods are not considered due to an increasing preference for convenience. This might explain why such positive attitudes towards organic foods, and also organic wines (Bernabéu *et al.*, 2008; Mann *et al.*, 2012), have not been transformed into real demand for these products (Schäufele and Hamm, 2018).

In this sense, the objective of this study was to advance in the study of the relationships between food neophobia, attitudes towards organic foods and the formation of consumer preferences in men and women. A conjoint analysis of these variables was conducted to determine the possibility of finding an effective segmentation to develop strategic actions aimed at the groups exhibiting greater acceptance of wine innovations and organic wine.

MATERIALS AND METHODS

The data used for this study were collected through face-to-face interviews with wine consumers conducted in the cities of Madrid, Leganés and Toledo (Spain). A total of 400 consumers were surveyed during September 2019. The maximum sampling error was 5.0%, for a confidence level of 95.5% (k=2), under the principle of maximum indetermination (p=q=50%). Before the fieldwork, a preliminary questionnaire was administered to 30 wine consumers to confirm that the survey questions were easily understandable. The survey was developed by a market research company ensuring that the distribution of age and education in the sample had a similar distribution with that observed in the Spanish population. Table I shows the socioeconomic characteristics of the sample.

Table I

Socioeconomic characteristics of the sample (%)

Variables	%
Gender	
Men	57.3
Women	42.7
Age (in years)	
18–24	14.0
25–34	21.0
35–49	20.0
no50–64	25.0
>65	20.0
Education level	
Elementary	28.5
Secondary	39.5
University	30.5
Postgraduate	1.5
Net monthly family income	
<900€	2.5
900–1,500€	15.0
1,501–2,100€	22.7
2,101–3,000€	35.7
>3,000€	24.1

Following initial data analysis, it was decided to analyse men's and women's preferences and neophobias related to wine consumption by direct segmentation of the sample and subsequent multivariate statistical analysis using the conjoint analysis (CA) technique (Green and Rao, 1971) and the WNS (Ristic *et al.*, 2016).

The CA technique was used to determine the wine consumers' preference structure in order to identify, explore and quantify their attitudes and thus detect their wine consumption preferences. Using the WNS, the level of aversion to trying new wines was analysed (Ristic *et al.*, 2016; Castellini and Samoggia, 2018) with the aim to identify the consumer segments more reluctant to buy new wines and the segments eager for innovation, which the range of new or innovative wines should target.

For the CA, the attributes and levels were selected drawing on previous articles on wine consumption (Skuras and Vakrou, 2002; Lockshin *et al.*, 2006; Mann *et al.*, 2012; Bernabéu *et al.*, 2013; Bernabéu *et al.*, 2016), consultation with 20 experts from

several fields (business, politics and research) and through a previous questionnaire. The most representative attributes and levels in the consumer purchasing process of red wine were selected. The selected attributes were price (5, 10, 15 €/0.75 L bottle), type of red wine (young, oak-aged), origin (Rioja, La Mancha), production system (conventional, organic) and Protected Designation of Origin (PDO) label (yes, no). By including the reported attributes, the goal was to identify the effect of gender on the importance ascribed to wine attributes, and also, to determine the importance of the production system in comparison with those attributes that have traditionally been reported as the most relevant ones when purchasing wine.

Combining these five attributes and their 11 levels, 48 different profiles would have been obtained. This number of profiles is considered too high to be presented to consumers. Therefore, an orthogonal design was used to reduce the number of combinations to only eight (Bretton-Clark, 1986). This lower number of profiles is considered to yield more effective evaluation, preventing routine responses and fatigue (Kirk, 1982;Bernabéu *et al.*, 2018).

Once the hypothetical wines had been created (Table II), a set of cards to present to consumers for assessment was designed. To evaluate the purchasing decisions for the hypothetical wines a scale from one to ten points, with one being the minimum value (the lowest rated wine) and ten the maximum one (the highest rated wine), was used. These scores were then used to determine the influence of each attribute and level on the consumers' preferences when purchasing wine.

For each of the groups of wine consumers (men and women), the regression in Equation 1 was used.

$$Y_i = \beta_0 + \beta_1 \times PRI + \beta_2 \times TYPE + \beta_3 \times ORIG + \beta_4 \times ORG + \beta_5 \times CER + \varepsilon \quad \textbf{Eq. 1}$$

βi = regression coefficients; PRI = price; TYPE = dummy for young wine; ORIG = dummy for the La Mancha origin; ORG = dummy for organic wine; CER = dummy variable for the Protected Designation of Origin; ε = term of error.

Table II

Hypothetical wines presented to the consumers

Wine	Price (€/0.75 L)	Type	Origin	Production system	PDO Certification
1	5	Oak-aged	Rioja	Conventional	No
2	10	Young	La Mancha	Conventional	No
3	10	Oak-aged	Rioja	Organic	Yes
4	5	Oak-aged	La Mancha	Organic	No
5	15	Oak-aged	La Mancha	Conventional	Yes
6	5	Young	Rioja	Conventional	Yes
7	5	Young	La Mancha	Organic	Yes
8	15	Young	Rioja	Organic	No

Source: own preparation.

Results were obtained by using the categories module from the SPSS statistical package for Windows (version 23.0), adapted to the decomposition model. The conjoint program permits estimation of the marginal utilities for each attribute, the total utility of each profile and the relative importance of each profile attribute.

To assess wine consumers' neophobia, defined as the fear or irrational aversion to different, new wines, the WNS, based on the FNS (Pliner and Hobden, 1992), and designed by Ristic *et al.* (2016) was used. The WNS comprised eight items to which respondents reply according to their level of agreement/disagreement with the statements, scoring accordingly on a 9-point Likert-type scale, in which 1 (one) is total disagreement and 9 (nine) is total agreement. The use of the WNS to evaluate consumer attitudes towards innovative wines is based on the idea that a consumer open to trying unknown wines may well be keen to try innovative wines. Conversely, the more traditional the wine consumer is, the more reluctant they will be to try unknown, innovative wines.

The items analysed were: (1) I like going to places serving wines from different countries; (2) I will drink almost any wine; (3) I am afraid to drink wines I have never had before; (4) At social gatherings, I will try a new wine; (5) I like wines from different countries; (6) If I do not know what wine it is, I won't try it; (7) I do not trust new wines; (8) I am constantly trying new and different wines. These statements are considered as either direct or reversed according to the attitudes reported by consumers on the WNS. Items 1, 2, 4, 5 and 8 were identified as reversed to neophobic attitudes in wine consumption, with the scores being inversely transformed in the calculation of the final score on the WNS.

To identify the wine neophobic consumer segments (greater aversion to trying new wines) and the wine neophilic consumer segments (greater willingness to

try new wines), the mean values in the WNS score were used (Lockshin and Corsi, 2012; Bernabéu *et al.*, 2013; Niimi *et al.*, 2019). Consumers above the mean were considered neophobic and those below were identified as neophilic. In addition, these neophobic and neophilic consumer groups were subdivided into two groups according to gender. The statistical analyses were conducted using the SPSS statistical package. The existence of significant differences for a maximum error or 1%, 5% and 10% have been identified (Ureña *et al*., 2008).

RESULTS AND DISCUSSION

Determination of men's and women's wine preferences

Using the parameters estimated according to the consumers' willingness to purchase wine, the utilities associated with each level of each attribute were calculated (Table III).

Table III

Estimated utility of the attribute levels

Attribute	Level	Consumers	
		Men (57.3%)[1]	Women (42.7%)[1]
Price	5 €/0.75 L	1.093	1.289
	10 €/0.75 L*	0.047	−0.143
	15 €/0.75 L	−1.140	−1.146
Type	Young	−0.257	−0.180
	Oak-aged	0.257	0.180
Origin	Rioja	0.163	0.163
	La Mancha	−0.163	−0.163
Production system*	Organic	0.016	0.122
	Conventional	−0.016	−0.122
PDO Certification	Yes	0.190	0.196
	No	−0.190	−0.196

1 Size of segment.
* Indicates significant differences with a maximum error of 10%.

The relative importance (RI) of each attribute was calculated as the proportion of the utility value for each attribute relative to the total utility of all the attributes (Halbrendt *et al.*, 1991), using Equation 2.

$$RI = \frac{\max U_i - \min U_i}{\sum(\max U_i - \min U_i)} \times 100 \qquad \textbf{Eq. 2}$$

Thereby, the attributes to which men and women assigned the least and most importance when purchasing wine could be identified (Figure 1).

The results showed that, for both men and women, price was the attribute with the greatest effect on their wine purchasing decisions. They coincide with the findings of the study conducted by Mann *et al.* (2012) on Swiss wine consumers. However, findings revealed differences between the preferences expressed by men and women regarding the other attributes under study. For men, the price was followed in order of importance by type of wine, DOP, origin, and production system, while for women, it was followed by DOP, type of wine, origin, and production system. The PDO was, then, more important for men and women than the organic label when purchasing wine. This could be the result of a clear identification of the PDO with the origin (Sepúlveda *et al.*, 2010), which is one of the main attributes than consumers consider when purchasing wine (Mann *et al.*, 2012; Yang and Paladino, 2015; Schäufele and Hamm, 2018).

As regards the differences between genders, one of the main differences was the greater importance women ascribe to organically produced wines. This result was in line with the findings of various studies reporting that women are more sensitive to the purchase of organic products (Ureña *et al.*, 2008; Olivas and Bernabéu, 2012; Rodríguez-Bermúdez *et al.*, 2020). Previous research has reported that women's more positive evaluation of organic foods could be the result of greater environmental awareness and interest in health (Pearson *et al.*, 2010; Olivas and Bernabeu, 2012; Kesse-Guyot *et al.*, 2013; Irianto, 2015). However, in the specific case of wine, Di Vita *et al.* (2019) showed men are more willing to pay a higher price for organic wines. Hence, it seems that despite women's greater sensitivity towards organically produced wines (Mann *et al.*, 2012), they might be unwilling to pay a higher price for the product.

They might, however, be prepared to choose organic wine if the price were similar to that of conventionally produced wine. The results suggest that organic wines should be directed towards women as men shows no interest in this label.

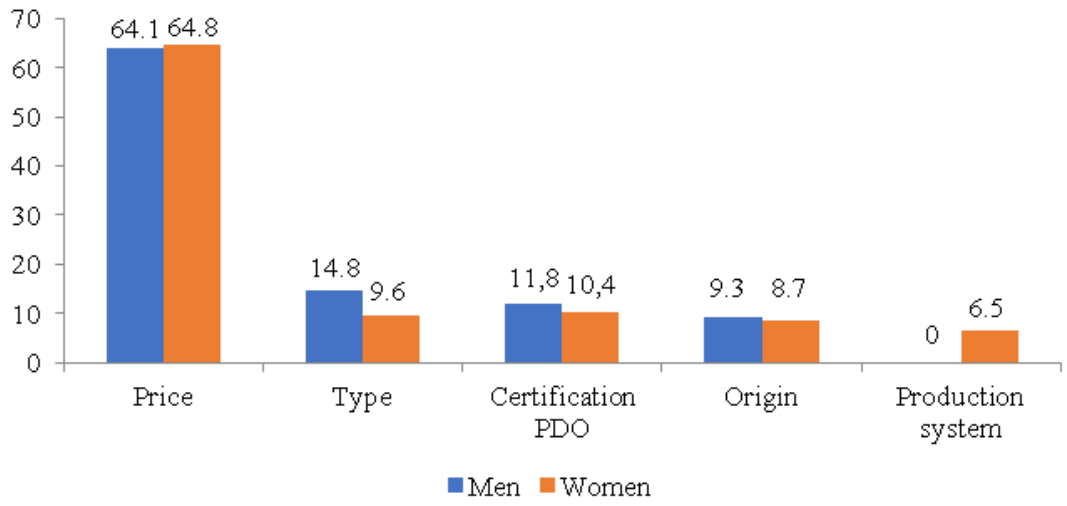

Figure 1. Relative importance of wine attributes by consumer (%).

The men seemed to show greater interest in the type of wine and production under PDO. A previous study conducted in Portugal showed that men pay greater attention to the bottle back label, which includes less general information, such as grape variety and PDO, while women were more influenced by the front label information, such as region of origin and awards (Ferreira *et al.*, 2019). Findings also corroborate those of studies on wine in New Zealand, Australia, UK and USA, which reported that women attached greater importance to price when purchasing wine (Remaud and Forbes, 2012).

Figure 2 shows the wines presented and the consumers' preferences in this regard. The highest scoring wines were wines 1, 3, 4, 6 and 7, and the lowest scoring wines 2, 5 and 8. The scores awarded by men were generally higher than those of women.

The three highest rated wines were the cheapest. The highest scoring wine was Wine 1, an oak-aged Rioja wine, conventionally produced and without POD, followed by Wine 6, a young Rioja, conventionally produced but with POD, and then Wine 7, a young La Mancha wine, organically produced and with POD. Consumers' ratings for Wines 6 and 7 were very close, with organic production apparently marking the difference.

Significant differences in the assessments made by women compared to those of men were found for Wine 2 ($p<0.05$), Wine 3 ($p<0.10$) and Wine 5 ($p<0.10$), suggesting that women are less willing to pay a higher price for wine compared to men, and when they do so, they choose an oak-aged wine rather than a young one.

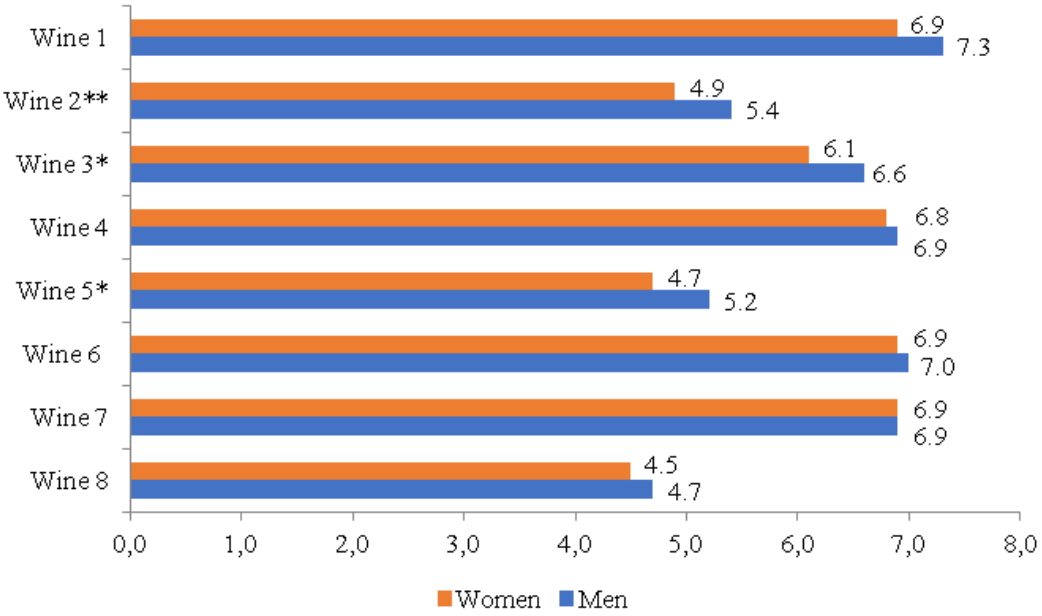

Figure 2. Mean scores awarded by the consumers to the hypothetical wines.

Determination of wine neophobia in men and women and their socioeconomic characteristics

Table IV shows the men's and women's scores on the WNS. Firstly, it is worth noting that Spanish wine consumers showed a higher level of wine neophobia compared to those from Australia (Ristic *et al.*, 2016) but a lower level than consumers in Italy (Castellini and Samoggia, 2018). Results showed higher wine neophobia scores in women than in men, arguably because women are less interested in wine, focusing their attention on more traditional and easily recognisable variables (Johnson and Bastian, 2007; Remaud and Forbes, 2012; De-Magistris *et al.*, 2015). However, lower interest in innovative wines in women may also be the result of women's preference for more natural or environmentally friendly products (Irianto, 2015). The concept of novel or innovative wine could conflict with the perception of wine as a traditional or natural product (Rabadán and Bernabéu, 2021a). Considering the general scores obtained in the WNS, innovative wines should preferably be directed towards men as their scores are, on average, two points lower than those obtained among women.

Table IV

Wine Neophobia Scale (WNS) presented to the wine consumers

Item	Variables	Consumers	
		Men	Women
1	I like going to places serving wines from different countries* (R)	4.5	5.0
2	I will drink almost any wine (R)	5.4	5.4
3	I am afraid to drink wines I have never had before	2.8	2.9
4	At social gatherings, I will try a new wine (R)	3.4	3.8
5	I like wines from different countries (R)	4.7	5.0
6	If I do not know what wine it is, I won't try it*	2.4	2.7
7	I do not trust new wines	2.8	2.9
8	I am constantly trying new and different wines** (R)	5.6	6.1
	Mean WNS score**	31.6	33.8

(R) Indicates negatively worded items for which scores were reversed for calculation of the WNS score. ** and * indicate significant differences with a maximum error of 5% and 10%, respectively.
Source: Own preparation, drawing on Ristic *et al.* (2016).

Findings coincide with those reported in the study by Nordin *et al.* (2004), which concluded that women presented higher levels of wine neophobia. However, a posterior work by Nguyen *et al.* (2019), specifically focused on wine neophobia in Chinese, Vietnamese and Australian consumers, reported no

significant gender-related differences. The heterogeneity in the origin of the consumers studied may be the reason of the different conclusions obtained in these studies. Thus, further studies are needed to determine whether the impact of gender on wine neophobia is associated with consumers' country of origin.

The results shown in Table 4 suggested that men are more willing than women to go to places where they can consume wine produced in different countries ($p<0.10$), to consume unfamiliar wines ($p<0.10$) and to constantly try new and different wines ($p<0.05$). There were significant differences between men and women on the WNS, with their scores being 31.6 and 33.8, respectively, suggesting that women are generally more reluctant to try new wines.

Table V shows the consumer segmentation according to level of wine neophobia and gender. The proposed segmentation seemed of great interest to identify different consumer groups as there were significant differences in frequency of wine consumption and in all the socioeconomic characteristics. The number of men in the neophilic and neo-phobic segments was similar, while in the case of the women, the majorities were included in the neophobic segment. Previous studies conducted in other countries have reported that women were typically more averse to trying new foods (Nordin *et al.*, 2004), although in other works these differences were not statistically significant (Fernández-Ruiz *et al.*, 2013).

The frequency of consumption was higher in men than in women, with differences in frequency according to neophobia level. The consumers with the highest frequency of consumption were neophilic men, and neophobic women were those with a significantly lower level of consumption. This result was expected, as greater exposure to a product usually results in lower neophobia towards that specific product (Rabadán and Bernabéu, 2021a). Exposure to a varied diet also reduces the general level of food neophobia (Rigal *et al.*, 2006). This conclusion may not be consistent across ages as it was reported that Italian neophobic Millennials were those who less frequently consumed wine (Castellini and Samoggia, 2018).

Table V

Frequency of consumption and socioeconomic characteristics of neophilic and neophobic wine consumers by gender (%)

Variables	Neophilic		Neophobic	
	Men (n=115)	**Women (n=66)**	**Men (n=114)**	**Women (n=105)**
Frequency* **				
Daily	28.7	12.1	19.3	5.7
Weekly	42.6	43.9	23.7	16.2
Monthly	11.3	12.1	14.9	15.2
Occasional	17.4	31.8	42.1	62.9
Age (in years) **				
18-24	8.7	15.2	15.8	17.1
25-34	22.2	15.2	22.8	21.0
35-49	21.7	31.8	18.4	12.4
50-64	27.0	30.3	19.3	25.7
>65	20.0	7.6	23.7	23.8
Education level **				
Elementary	29.6	16.7	33.3	29.5
Secondary	35.7	40.9	39.5	42.9
University	30.4	40.9	27.2	27.6
Postgraduate	4.3	1.5	0.0	0.0
Net monthly family income* **				
<900€	0.0	3.2	4.1	3.3
900–1,500€	18.5	20.6	12.2	9.8
1,501–2,100€	10.2	14.3	30.6	34.8
2,101–3,000€	39.8	27.0	38.8	33.7
>3,000€	31.5	34.9	14.3	18.5

*** and ** indicate significant differences with a maximum error of 1% and 5%, respectively.

Another study conducted in Spain by Rodríguez-Donate *et al.* (2017) found that women drank less wine than men, but it also showed that the segment of women wine consumers was highly heterogeneous (Rodríguez-Donate *et al.*, 2019). Thus, the differences in findings between neophobic and neophilic female consumers may clearly be accounted for by the marked heterogeneity of women.

Regarding the other socioeconomic variables, it was observed that neophilic wine consumers generally had higher educational level than their neophobic counterparts, which is especially evident in the case of women. The results for women also revealed more

clearly that older consumers with a lower level of education are more likely to score higher on wine neophobia (Meiselman *et al.*, 2010; Ristic *et al.*, 2016; Nguyen *et al.*, 2019; Rabadán and Bernabéu, 2021a). As previously reported by Meiselman *et al.* (2010) and Ristic *et al.* (2016), a higher educational level is associated with lower levels of neophobia, with neophilic female consumers being those with the highest levels of education (42.4% have university studies).

Regarding income, the clearest differences were found, regardless of gender, between neophilic and neophobic consumers. In the case of neophilic consumers, the net monthly family income of 31.5% of the men and 34.9% of the women is above 3,000 €. Neophobic consumers have traditionally been identified as older individuals, with a lower level of education and income (Meiselman *et al.*, 2010; Ristic *et al.*, 2016; Rabadán and Bernabéu, 2021b). In the specific case of wine, the most neophobic consumers also seemed to be less informed about wines, likely due to their lower frequency of consumption, especially in the case of neophobic women.

CONCLUSIONS

This work showed that, regardless of gender, price is the primary attribute considered when consumers buy wine. In order of importance, price was followed, at a considerable distance, by type of wine, PDO, origin and lastly whether it has been organically produced. Given the difference in the evaluation between price and the other attributes, can it can be stated that price determines and limits the purchase of wine.

The production system remains the lowest value attribute for both genders. However, women assigned greater importance than men to the organic label. This result, together with the higher wine neophobia reported for women, suggested that women are more interested in traditional wines and those produced using more natural ingredients and processes. This limits women's acceptance of novel wines, but also opens a window of opportunity for the development of more traditional and natural wines aimed at this segment. The development of this more natural and organic certified wines aimed at women appears to be a business opportunity. For wine consumers in general, the preferred red wine was inexpensive, oak-aged, with a PDO label, from Rioja and organically produced. Nonetheless, differences between men and women were found. The latter were less willing to pay higher price for wine, and if they had to pay such a price, they chose an oak-aged wine rather than a young one, and, if possible, one that has been organically produced.

Men were generally less neophobic than women, although a small segment of non-neophobic female wine consumers were willing to consume new, innovative wines. In addition, men drink wine more frequently than women, especially those who are less neophobic. This work suggests that the segment of neophilic men would be the most interesting segment for the marketing of new wines. With this information in mind, innovative wines should be developed specifically for this segment of non-neophobic men consumers.

In general, wine neophobia was found to increase with age and decrease as educational level and family income increase. Accordingly, when launching new or innovative wines, results suggest that wineries should target men consumers with higher levels of education and purchasing power.

There are two main limitations to this work. First, the surveys were only administered in three locations, while the results have been extrapolated to the country as a whole. However, by including three locations with different profiles, the effect of this restriction on the results is limited. Second, market research always has the weakness that there may be a difference between what consumer respondents say and what they actually do.

A future line of research would be to evaluate consumer attitudes towards specific types of technological and non-technological innovations, and to compare the importance ascribed to these factors with that reported for traditional attributes such as origin or price.

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REFERENCES

Bernabéu, R., Brugarolas, M., Martínez-Carrasco, L., Díaz, M., 2008. Wine origin and organic elaboration, differentiating strategies in traditional producing countries. *British Food Journal*, 110(2), 174-188.

Bernabéu, R., Díaz, M., Oliveira, F., 2016. Consumer preferences for red wine in the Spanish market. *Ciência Tec. Vitiv*., 31(2), 88-97.

Bernabéu, R., Prieto, A., Díaz, M., 2013. Preference patterns for wine consumption in Spain depending on the degree of consumer ethnocentrism. *Food Quality and Preference*, 28(1), 77-84.

Bernabéu, R., Rabadán, A., El Orche, N. E., Díaz, M., 2018. Influence of quality labels on the formation of preferences of lamb meat consumers. A Spanish case study. *Meat Science*, 135, 129-133.

Bonn, M. A., Cronin, J. J., Cho, M., 2016. Do environmental sustainable practices of organic wine suppliers affect consumers' behavioral intentions? The moderating role of trust. *Cornell Hospitality Quarterly*, 57(1), 21–37.

Bretton-Clark., 1986. Conjoint designer and conjoint analyzer. In Version 2.0. New York (US): SIMGRAF.

Brugarolas, M., Martinez-Carrasco, L., Bernabeu, R., Martinez-Poveda, A., 2010. A contingent valuation analysis to determine profitability of establishing local organic wine

markets in Spain. *Renewable Agriculture and Food Systems*, 25(1), 35-44.

Castellini, A., Samoggia, A., 2018. Millennial consumers' wine consumption and purchasing habits and attitude towards wine innovation. *Wine Economics and Policy*, 7(2), 128-139.

Cebrián-Tarancón, C., Sánchez-Gómez, R., Cabrita, M. J., García, R., Zalacain, A., Alonso, G. L., Salinas, M. R., 2019. Winemaking with vine-shoots. Modulating the composition of wines by using their own resources. *Food Research International*, 121, 117-126.

Damsbo-Svendsen, M., Frøst, M. B., Olsen, A., 2017. A review of instruments developed to measure food neophobia. *Appetite*, 113, 358-367.

De-Magistris, T., Gracia, A., Albisu, L. M., 2015. Examining Spanish consumers' proclivities towards premium foreign red wines. *New Medit*, 14(1), 34-41.

Di Vita, G., Pappalardo, G., Chinnici, G., La Via, G., D'Amico, M., 2019. Not everything has been still explored: Further thoughts on additional price for the organic wine. *Journal of Cleaner Production*, 231, 520-528.

Fernández-Ruiz, V., Claret, A., Chaya, C., 2013. Testing a Spanish-version of the Food Neophobia Scale. *Food Quality and Preference*, 28(1), 222-225.

Ferreira, C., Lourenço-Gomes, L., Pinto, L. M. C., Silva, A. P., 2019. Is there a gender effect on wine choice in Portugal? – A qualitative approach. *International Journal of Wine Business Research*, 31(4), 618-639.

Galanakis, C. M., 2019. Innovations in traditional foods. Woodhead Publishing.

Galati, A., Schifani, G., Crescimanno, M., Migliore, G., 2019. "Natural wine" consumers and interest in label information: An analysis of willingness to pay in a new Italian wine market segment. *Journal of Cleaner Production*, 227, 405-413.

Green, P. E., Rao, V. R., 1971. Conjoint Measurement- for Quantifying Judgmental Data. *Journal of Marketing Research*, 8(3), 355–363.

Grunert, K. G., Jensen, B. B., Sonne, A. M., Brunsø, K., Byrne, D. V., Clausen, C., … Scholderer, J., 2008. User-oriented innovation in the food sector: relevant streams of research and an agenda for future work. *Trends in Food Science and Technology*, 19(11), 590-602.

Grunert, K. G., Jensen, B. B., Sonne, A. M., Brunsø, K., Scholderer, J., Byrne, D. V., … Lettl, C., 2010. Consumer-oriented innovation in the food and personal care products sectors: understanding consumers and using their insights in the innovation process. In Consumer-driven innovation in food and personal care products. 24 pp. Woodhead Publishing.

Halbrendt, C. K., Wirth, E. F., Vaughn, G. F., 1991. Conjoint analysis of the Mid-Atlantic food-fish market for farm-raised hybrid/striped bass. *Southern Journal of Agricultural Economics*, 23(1), 155-163.

Hursti, U.-K. K., SjÖDÉN, P.-O., 1997. Food and General Neophobia and their Relationship with Self-Reported Food Choice: Familial Resemblance in Swedish Families with Children of Ages 7–17 Years. *Appetite*, 29(1), 89-103.

Irianto, H., 2015. Consumers' attitude and intention towards organic food purchase: An extension of theory of planned behavior in gender perspective. *International journal of management, economics and social sciences*, 4(1), 17-31.

Janssen, M., Schäufele, I., Zander, K., 2020. Target groups for organic wine: The importance of segmentation analysis. *Food Quality and Preference*, 79.

Johnson, T. E., Bastian, S. E. R., 2007. A preliminary study of the relationship between Australian wine consumers' wine expertise and their wine purchasing and consumption behaviour. *Australian Journal of Grape and Wine Research*, 13(3), 186-197.

Kesse-Guyot, E., Péneau, S., Méjean, C., Szabo de Edelenyi, F., Galan, P., Hercberg, S., Lairon, D., 2013. Profiles of organic food consumers in a large sample of French adults: results from the Nutrinet-Santé cohort study. *PLoS One*, 8(10), e76998.

Kirk, J., 1982. Experimental design: Procedures for the behavioural sciences (2nd Ed. ed.). Monterrey: Brooks-Cole Co.

Little, J., Ilbery, B., Watts, D., 2009. Gender, Consumption and the Relocalisation of Food: A Research Agenda. *Sociologia Ruralis*, 49(3), 201-217.

Lockie, S., Lyons, K., Lawrence, G., Mummery, K., 2002. Eating 'Green': Motivations behind organic food consumption in Australia. *Sociologia Ruralis*, 42(1), 23-40.

Lockshin, L., Corsi, A. M., 2012. Consumer behaviour for wine 2.0: A review since 2003 and future directions. *Wine Economics and Policy*, 1(1), 2-23.

Lockshin, L., Jarvis, W., d'Hauteville, F., Perrouty, J.-P., 2006. Using simulations from discrete choice experiments to measure consumer sensitivity to brand, region, price, and awards in wine choice. *Food Quality and Preference*, 17(3), 166-178.

Loose, S. M., Lockshin, L., 2013. Testing the robustness of best worst scaling for cross-national segmentation with different numbers of choice sets. *Food Quality and Preference*, 27(2), 230-242.

Mann, S., Ferjani, A., Reissig, L., 2012. What matters to consumers of organic wine? *British Food Journal*, 114(2), 272-284.

Mauracher, C., Procidano, I., Valentini, M., 2019. How product attributes and consumer characteristics influence the WTP, resulting in a higher price premium for organic wine. *Sustainability*, 11(5), 1498.

Meiselman, H. L., King, S. C., Gillette, M., 2010. The demographics of neophobia in a large commercial US sample. *Food Quality and Preference*, 21(7), 893-897.

Migliore, G., Thrassou, A., Crescimanno, M., Schifani, G., Galati, A., 2020. Factors affecting consumer preferences for "natural wine": An exploratory study in the Italian market. *British Food Journal*, 122(8), 2463-2479.

Morrison, K. T., Nelson, T. A., Ostry, A. S., 2011. Mapping spatial variation in food consumption. *Applied Geography*, 31(4), 1262-1267.

Nguyen, A. N. H., Johnson, T. E., Jeffery, D. W., Capone, D. L., Danner, L., Bastian, S. E. P., 2020. Sensory and Chemical Drivers of Wine Consumers' Preference for a New Shiraz Wine Product Containing Ganoderma lucidum Extract as a Novel Ingredient. *Foods*, 9(2), 224.

Nguyen, A. N. H., Johnson, T. E., Jeffery, D. W., Danner, L., Bastian, S. E. P., 2019. A cross-cultural examination of Australian, Chinese and Vietnamese consumers' attitudes towards a new Australian wine product containing Ganoderma lucidum extract. *Food Research International*, 115, 393-399.

Niimi, J., Danner, L., Bastian, S. E., 2019. Wine leads us by our heart not our head: emotions and the wine consumer. *Current Opinion in Food Sci*ence, 27, 23-28.

Nordin, S., Broman, D. A., Garvill, J., Nyroos, M., 2004. Gender differences in factors affecting rejection of food in healthy young Swedish adults. *Appetite*, 43(3), 295-301.

OECD, 2018. Oslo Manual 2018: Guidelines for Collecting, Reporting and Using Data on Innovation, 4th Edition, The Measurement of Scientific, Technological and Innovation Activities, OECD Publishing, Paris/Eurostat, Luxembourg.

Available at: https://ec.europa.eu/eurostat/documents/3859598/9718996/KS-01-18-852-EN-N.pdf/7817c566-ef37-498a-8786-a25c200318ae?t=1554891299000 (accessed on 06.03.2021).

OIV, 2019. Statistical Report on World Vitiviniculture. Available at: https://www.oiv.int/public/medias/6782/oiv-2019-statistical-report-on-world-vitiviniculture.pdf (accessed on 06.03.2021).

Olivas, R., Bernabeu, R., 2012. Men's and women's attitudes toward organic food consumption. A Spanish case study. *Spanish Journal of Agricultural Research*, 10(2), 281-291.

Pearson, D., Henryks, J., Jones, H., 2010. Organic food: What we know (and do not know) about consumers. *Renewable Agriculture and Food Syste*ms, 26(2), 171-177.

Pelet, J.-É., Durrieu, F., Lick, E., 2020. Label design of wines sold online: Effects of perceived authenticity on purchase intentions. *Journal of Retailing and Consumer Services*, 55, 102087.

Pliner, P., Hobden, K., 1992. Development of a scale to measure the trait of food neophobia in humans. *Appetite*, 19(2), 105-120.

Pomarici, E., Amato, M., Vecchio, R., 2016. Environmental friendly wines: A consumer segmentation study. *Agriculture and agricultural science* procedia, 8, 534-541.

Pretorius, I. S., 2020. Tasting the terroir of wine yeast innovation. *FEMS yeast research*, 20(1).

Rabadán, A., 2021. Consumer Attitudes towards Technological Innovation in a Traditional Food Product: The Case of Wine. *Foods*, 10(6), 1363.

Rabadán, A., Bernabéu, R., 2021a. An approach to eco-innovation in wine production from a consumer's perspective. *Journal of Cleaner Production*, 310, 127479.

Rabadán, A., Bernabéu, R., 2021b. A systematic review of studies using the Food Neophobia Scale: Conclusions from thirty years of studies. *Food Quality and Preference*, 93, 104241.

Remaud, H., Forbes, S. L., 2012. The influence of gender on wine purchasing and consumption: An exploratory study across four nations. *International Journal of Wine Business Research*, 24(2), 146-159.

Remaud, H., Mueller, S., Chvyl, P., Lockshin, L., 2008. Do Australian wine consumers value organic wine? In: *Proceedings of 4th International Conference of the Academy of Wine Business Research*. Siena, Italy.

Rigal, N., Frelut, M.-L., Monneuse, M.-O., Hladik, C.-M., Simmen, B., Pasquet, P., 2006. Food neophobia in the context of a varied diet induced by a weight reduction program in massively obese adolescents. *Appetite*, 46(2), 207-214.

Ristic, R., Johnson, T. E., Meiselman, H. L., Hoek, A. C., Bastian, S. E. P., 2016. Towards development of a Wine Neophobia Scale (WNS): Measuring consumer wine neophobia using an adaptation of The Food Neophobia Scale (FNS). *Food Quality and Preference*, 49, 161-167.

Rodríguez-Bermúdez, R., Miranda, M., Orjales, I., Ginzo-Villamayor, M. J., Al-Soufi, W., López-Alonso, M., 2020. Consumers' perception of and attitudes towards organic food in Galicia (Northern Spain). *International Journal of Consumer Studies*, 44(3), 206-219.

Rodríguez-Donate, M. C., Romero-Rodríguez, M. E., Cano-Fernández, V. J., Guirao-Pérez, G., 2017. Sociodemographic determinants of the probability of wine consumption in Tenerife (Canary Islands). *International Journal of Wine Business Research*, 29(3), 316-334.

Rodríguez-Donate, M. C., Romero-Rodríguez, M. E., Cano-Fernández, V. J., Guirao-Pérez, G., 2019. Gender and wine consumption: sociodemographic profiles. *British Food Journal*, 122(1), 242-257.

Rossetto, L., Galletto, L., 2019. Retail strategies for rosé wines in Italy: a hedonic price analysis. *International Journal of Wine Business Research*, 31(3), 282-302.

Saltman, Y., Johnson, T. E., Wilkinson, K. L., Ristic, R., Norris, L. M., Bastian, S. E. P., 2017. Natural flavor additives influence the sensory perception and consumer liking of Australian chardonnay and shiraz wines. *American Journal of Enology and Viticulture*, 68(2), 243-251.

Schäufele, I., Hamm, U., 2017. Consumers' perceptions, preferences and willingness-to-pay for wine with sustainability characteristics: A review. *Journal of Cleaner Production*, 147, 379-394.

Schäufele, I., Hamm, U., 2018. Organic wine purchase behaviour in Germany: Exploring the attitude-behaviour-gap with data from a household panel. *Food Quality and Preference*, 63, 1-11.

Sellers, R., 2016. Would you pay a price premium for a sustainable wine? The voice of the Spanish consumer. *Agriculture and agricultural science procedia*, 8, 10-16.

Sepúlveda, W. S., Maza, M. T., Mantecón, Á. R., 2010. Factors associated with the purchase of designation of origin lamb meat. *Meat Science*, 85(1), 167-173.

Skuras, D., Vakrou, A., 2002. Consumers' willingness to pay for origin labelled wine: A Greek case study. *British Food Journal*, 104(11), 898-912.

Tonon, T., Martinez, C., Poloni, S., Nalin, T., Macdonald, A., Schwartz, I. V. D., 2019. Food neophobia in patients with phenylketonuria. *Journal of Endocrinology and Metabolism*, 9(4), 108-112.

Trauger, A., 2004. 'Because they can do the work': Women farmers in sustainable agriculture in Pennsylvania, USA. *Gender, Place & Culture*, 11(2), 289-307.

Tuorila, H., Lähteenmäki, L., Pohjalainen, L., Lotti, L., 2001. Food neophobia among the Finns and related responses to familiar and unfamiliar foods. *Food Quality and Preference*, 12(1), 29-37.

Ureña, F., Bernabéu, R., Olmeda, M., 2008. Women, men and organic food: Differences in their attitudes and willingness to pay. A Spanish case study. *International Journal of Consumer Studies*, 32(1), 18-26.

Wiedmann, K.-P., Hennigs, N., Behrens, S. H., Klarmann, C., 2014. Tasting green: an experimental design for investigating consumer perception of organic wine. *British Food Journal*, 116(2), 197-211.

Yang, Y., Paladino, A., 2015. The case of wine: understanding Chinese gift-giving behavior. *Marketing Letters*, 26(3), 335-361.

Yormirzoev, M., Li, T., Teuber, R., 2021. Consumers' willingness to pay for organic versus all-natural milk – Does certification make a difference? *International Journal of Consumer Studies*, 45(5), 1020-1029.