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Can Consumers Discriminate Between Sensory Attributes in Wine: The Case of Bordeaux Reds

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Abstract

***Purpose**: The purpose of this study is to establish if wine consumers can discriminate through tasting various Bordeaux red wines emanating from different classified terroirs.*
***Design/Methodology/Approach**: A simultaenous blind tasting of five wines was conducted and respondents were asked to rate seven different sensory characteristics of wine as well as perceived quality. Ranking of the five wines as well as willingness to pay was recorded.*
***Findings**: The respondents, who are highly involved wine buyers, were able to differentiate significantly between the individual sensory attributes of each wine. The findings obtained from overall quality measurement are less clear with non significant differences between the two most highly perceived wines, St. Emilion and Graves. There are also non significant differences in the quality of Medoc compared to that of Cote de Blaye as well as Cote de Blaye with Cote de Bourg. These findings must be considered carefully due to the limitation of the current sample size and homogeneity of respondents. A larger and more representive sample is currently participating in the experiment. Willingness to pay is an interesting window into understanding if wines are priced appropriately or not. The sample were willing to pay more for the St. Emilion than all other wines, but still less than the actual retail price. On the other hand, the sample was willing to pay more than the retail price for the wines from Graves and Cote de Bourg.*

Keywords: Bordeaux, Sensory/intrinsic attributes, Marketing

1. BACKGROUND

The purchase decision by consumers is moderated by many factors, both extrinsic and intrinsic, that define the product category being shopped. There is a research stream focused on studying consumers' preferences for various food products. In general, the purchase of such a product can be influenced by intrinsic characteristics, such as taste and colour, and extrinsic characteristics, such as brand and country of origin. One product category that is of special interest globally is wine. Managers, marketers and researchers are working to define consumers' expectations and demands based on consumers' preferences for product attributes.

Wine is an example of a complex product that differs from many other products because of the wide variation of grape varieties, regions, taste, wine styles and many other factors. Research has been conduced to determine how customers make their purchase decisions concerning wine based on several cues that can predict wine quality. However, these cues are different for each wine in accordance with general wine knowledge and regional and winery style (Horowitz and Lockshin, 2002). Furthermore, the level of quality may vary due to numerous circumstances including the consumption occasion (Quester and Smart, 1998). Thus, consumers who are trying to choose and purchase a bottle of wine face complex information and cues on the label, which are not easy to assess for the less experienced consumers. As intrinsic attributes are difficult to assess without tasting the wine, most studies on wine choice behavior are based on extrinsic cues.

Researchers have tried to define wine quality on the basis of objective characteristics that are based on chemical and instrumental analyses of wine attributes. Such characteristics include acidity, colour, volatile components, and other aroma-related and measurable attributes. Wine's compositional and sensory profiles are widely documented and several models have been proposed to identify and classify wine quality and origin, based on these profiles (for example, Cliff and Dever 1996; Koussissia, 2009; Kwan and Kowalski, 1980; Vanier *et al.*, 1999). These measures, however, are not fully appreciated by consumers, who generally rely on their own perception of product qualities. Furthermore, some characteristics are not easily measurable. For example, the aroma and other sensory attributes of wine are complex and difficult to measure and describe. Hence, sensory evaluation of wine is usually performed by wine experts who evaluate the wine and describe its attributes for potential consumers. It is often that wine experts publish their opinions on a variety of wines in guide books, wine magazines, daily newspapers or other media, and their expertise is usually accepted by producers, retailers and consumers, constituting a basis for a quality rating. However, when sensory quality scores are employed in wine guidebooks a significant relationship with price occurs, and for many buyers, price acts as a surrogate for a range of intrinsic cues (Zeithaml, 1988).

For most consumers, purchasing wine involves risk and therefore, risk reducing cues are sought. One way is to choose the wine on the basis of price, which some consumers use as an indication of wine quality; the higher the price, the greater the percevied quality (Angulo *et al*., 2000; Combris *et al*., 2000; Oczkowski, 1994; Wade, 1999). Another option of reducing risk in purchasing wine is a recommendation by a friend or by the seller in the wine store. Recommendation was reported as an important factor in the choice of wine in a wine store in several countries (Cohen, 2009; Goodman, 2009). However, previously having tasted the wine, the price, the origin, the grape variety, and the brand name of the wine were all mentioned frequently in several studies with different ranking of importance (Lockshin and Hall, 2003).

Tasting the wine is an important issue in choosing wine (Keown and Casey, 1995). Another study concluded that taste was the attribute most highly correlated to wine choice (Thompson and Vourvachis, 1995). However, Lange (2000) and Lange et al. (2002) demonstrated in France the role of extrinsic factors in the overall sensory evaluation of a wine. More recent research by Marin et al. (2007), Siegrist and Cousin (2009), Combris et al. (2009), Wasnick et al. (2007), Plassman et al. (2008) and Lockshin et al. (2009) have investigated how specific extrinsic attributes contribute to a consumers' sensory evaluation. There is an ongoing debate as to what is the best tool for selecting a wine. Currently, consumer behaviour research has advanced to integrate both intrinsic and extrinsic attributes in these studies as evidenced by Mueller et al. (2010). The future of wine research is to continue to integrate these research streams.

When tasting is available in a winery or in a wine store, the customer is supposed to select (and buy) a bottle of wine (or more) based on his/her preference. The customer in this case faces several alternatives while he or she is supposed to decide which wine to select, or which wine he or she prefers. What are the sensory attributes that most affect the customer preference and the decision to purchase a wine? From the producers' point of view, an answer to this question might indicate a potential marketing strategy that is based on those important attributes in particular relating to the commentary on wine back labels. Such a strategy might be more effective and efficient than others since it will focus on the potential impetus for less experienced consumers' choice.

The main objective of this study is to identify the ability of a consumer to differentiate between the sensory attributes of red wine that most influence customers in their purchasing decision. This concept is of particular importance in 'Old World' wine countries like France where the industry is heavily regulated and based upon defined terroirs. This means that wines produced in specific regions and classified by this terroir should have similar sensory profiles. This study was restricted to red wines from various Bordeaux regions that are sold in supermarkets for regular consumption. Bordeaux was selected, as it is a major wine-producing region in France and at the same time has a celebrated history regarding the 'claimed' uniqueness of its terroirs. This selection is further supported by the research of Cohen and Tataru (2011) who showed that Bordeaux is dominant with a notably higher penetration relative to other French wine regions in the French retail wine market.

2. METHODOLOGY

The subjects used in this study are wine master students in a French institute. The limitations of this sample are discussed at a later point. Thirty nine valid questionnaires were valid out of 40 that participated. The tasting experiment was performed in a wine tasting lab. The researchers presented the five wines simultanuously in five glasses. All of the tasted wines were presented to the subjects simultaneously, without any information provided.

A blind tasting method was used to capture the effect of wine qualities only. The following intrinsic wine attributes: color, aroma, bouquet, taste, tannins, harmony (balance), and aftertaste sensation were investigated. This set of wine attributes conforms to the generally accepted rules of wine tasting (see, for example, Kolpan *et al*., 1996). This experiment analysed five different red wines from different registered terroirs in the Bordeaux region. The wines were not selected to be sensorialy representative of their respective terroirs, but rather to correpond to a competing selection of low-priced wines in a retail environment. The purpose of this research is to apply a marketing approach to a sensory question. Subjects were

asked to taste the wine and to rate each of the aformetnioned 7 wine attributes. Respondents were asked to rate each of these attributes on an interval scale of 1-10 and rate their perception of the overall quality using the same interval scale. It was required to also rank the five wines they tasted in order of purchase preference and state the price they would be willing to pay for each wine. One higher priced wine was selected to ascetain if the respondents could identify this wine in order to establish if quality was related to price.

3. RESULTS

The first step in this study was to explore whether there are any differences among the five wines based upon the wine attributes and the overall quality. The results are presented in Table 1 below. The results show differences in the perception of the wine attributes (ANOVA, $p<0.01$). Wines 4 and 5 (Graves and St. Emilion, respectively) were rated as the best overall quality (no significant difference) while all the other wines rated lower. The overall quality of wine 1 (Medoc) and wine 2 (Cote de Blaye) are similar and wine 2 (Cote de Blaye) is not significantly different from wine 5 (Cote de Bourg). The result regarding Cote de Blaye and Cote de Bourg are of particular interest considering the new terroir designations of Cote de Bordeaux, which Cote de Bourg has chosen not to be a part of. This indicates this decision will have strategic importance from a marketing standpoint rather than quality as there is not a significant quality difference.

Table 1: Mean and standard error of sensory attributes for Bordeaux wines

	Mean (SE)					
	Medoc	Cote de Blaye	Graves	St. Emilion	Cote de Bourg	Average for
Attribute	1	2	3	4	5	all wines
Color	5.33 (0.25)	6.38 (0.25)	7.21 (0.21)	7.49 (0.23)	6.64 (0.25)	6.61 (0.12)
Aroma	5.46 (0.27)	5.21 (0.25)	6.49 (0.24)	6.44 (0.23)	5.51 (0.27)	5.82 (0.12)
Bouquet	5.18 (0.28)	5.08 (0.28)	6.42 (0.21)	6.54 (0.25)	5.38 (0.31)	5.72 (0.13)
Taste	4.56 (0.30)	5.15 (0.23)	6.12 (0.22)	6.33 (0.20)	5.38 (0.27)	5.51 (0.12)
Tannins	4.94 (0.32)	5.08 (0.26)	6.42 (0.21)	7.00 (0.23)	5.88 (0.26)	5.86 (0.13)
Harmony	4.23 (0.28)	4.90 (0.26)	5.90 (0.23)	5.85 (0.25)	5.36 (0.30)	5.25 (0.12)
Aftertaste	4.28 (0.31)	4.51 (0.33)	5.90 (0.25)	5.83 (0.27)	5.13 (0.29)	5.13 (0.14)
Overall quality	4.14^{a} (0.32)	$4.82^{a,b}$ (0.31)	6.08^{c} (0.25)	6.05^{c} (0.22)	5.00^{b} (0.28)	5.22 (0.13)
Price, €	3.36 (0.33)	3.83 (0.28)	5.19 (0.41)	5.35 (0.40)	4.17 (0.30)	
Retail price, €	4.25	3.99	4.25	7.15	3.65	

All wines attributes are significantly different at $p<0.001$
The superscripts a,b,c indicate similar means (no significant differences), all other significant differences between means are significantly different at $p<0.01$

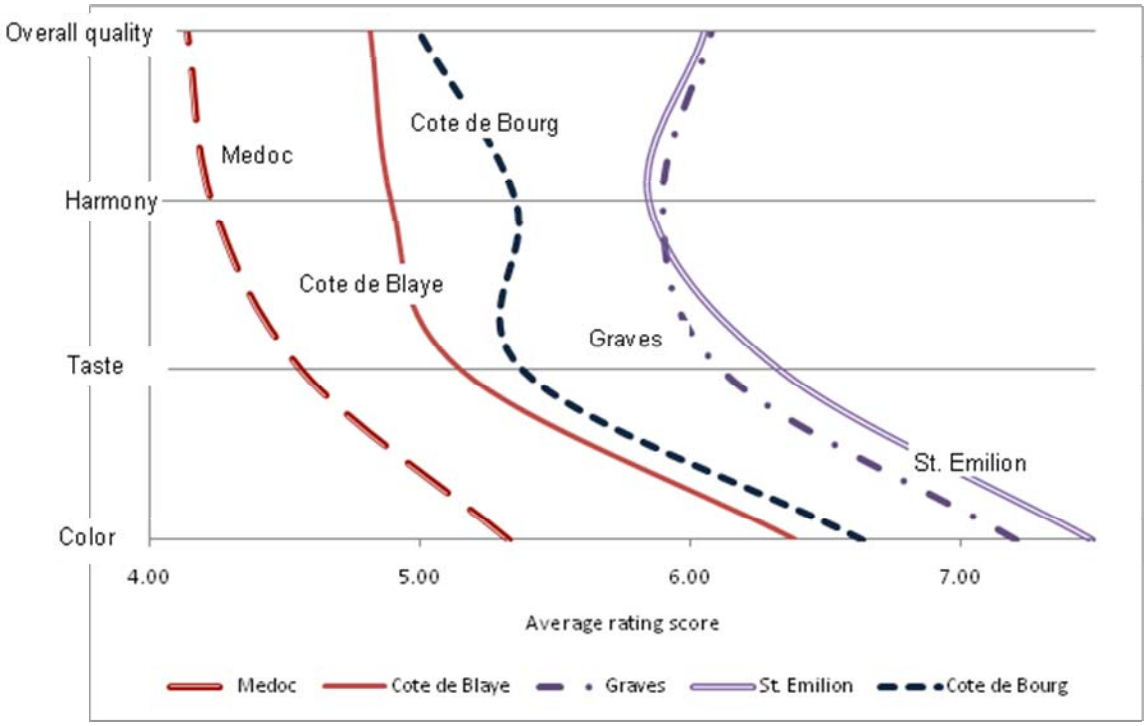
The respondents in this research are willing to pay more for a bottle of St. Emilion than any of the other four wines, on average. However, it is still lower than the retail price of this wine, 7.15 €. This does indicate that the sample studied do really know wine well and can discern

that there is a wine of a higher price and by proxy quality in their choice set. The next stage of the research requires the respondents re-tasting the wines with the label, which is in progress now and will certainly provide great insight into how the extrinsic attributes can influence perceptions of the sensory factors.

What are the relevant intrinsic attributes that most influence consumers when they consider purchasing wine? To answer this question, a stepwise multiple linear regression analysis for the data was employed, based on the assumption that the overall consumer quality of the wine is a function of the wine attributes considered by the subjects (the independent variables). Colour, taste and harmony were found as significant attributes that most influence consumers in their preference ($p<0.01$, Regression $R^2=0.488$). It can be concluded from this analysis that consumers having the high involvement background of these participants tend to evaluate wines mostly based on their taste and balance. Similar conclusions have been reported by Charters and Pettigrew (2007). Their findings suggest that for most consumers, the foremost determinant of wine quality seems to be the taste and the second important characteristic is balance (Charters and Pettigrew, 2007). However, these results do not provide details how consumers' segments perceive these wine attributes while tasting the wine. Further analyses are required to obtain more insightful information.

The contribution of each attribute to the overall perceived quality of the wines is not obvious. To obtain this information we carried out a perceptual gap analysis of the wine attributes that influence the overall quality as found by the regression analysis. The analysis is presented in Figure 1 as a snake plot of consumers perceptions of the specific wine attributes. The lines in Figure 1 present the five wines, the Y axis presents the wine attributes that comprising the regression equation, and the X axis presents the perceptual attribute ratings of the wine attributes. The perceptual gap analysis as presented in Figure 1 demonstrates the differences in consumer perceptions of the five wines. It is obvious that consumers perceived wines from Graves and from St. Emilion as the best wines with almost the same levels of importance and quality. The wine from Medoc is perceived as the worst wine among the five wines that were tasted and the other two wines, from Cote de Bourg and Cote de Blaye were perceived as better than the wine from Medoc but less preffered comparing the wines from St. Emilion and Graves. These findings were also confirmed when looking at the rankings attribtued to the five wines

Figure 1: Perceived gap analysis for the wines



4. LIMITATIONS & FUTURE RESEARCH

There are limitations that need to be considered for this paper. The current sample size (39 students) is not representative. This is a group of young, highly involved wine buyers as discovered through the demographic and involvment measurement in the survey.

However, the data presented is an initial component of this study. Currently, less involved wine buyers from a broader age and income range have been recruited to participate in this study. The findings of this paper are only one component of the research. There is also a second stage of this study that will replicate this tasting experiment, however with the labels presented. The respondents will also participate in a conjoint study to measure the effects of these appellations in Bordeaux in relation to price and quality wine identification measured through the use of Grand Cru classification. This completed study will be used as a pilot to perfect the measurement techniques. Future research with appropriate funding is sought to investigate a much larger sample with a greater variety of terroirs, quality and price levels.

5. IMPLICATIONS & CONCLUSIONS

Understanding consumers perceptions of different wines is of great importance for marketers. An analysis that considers the competitive position of the various wines in light of consumers perceptions can provide useful information that can be used in formulating a marketing strategy to attract consumers. This research with this sample of respondents and the analysis of the five different red wines allows managers to gain more insight into the competitive positioning of their product compared to that of other competitors. It can be suggested that high involved consumers can differentiate between wines using sensory attributes. The question as to whether an average wine consumer can is still unanswered in this study, but

prelimary results shall be available soon.

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