Experience, sensorial skills and personality qualifying a wine consumer as an expert

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1. Introduction

This paper highlights the characteristics of wine consumers that may qualify them as wine experts. In this work, the expertise of wine consumers was measured through various degrees of self-perceived ability. Participants ranged from limited-knowledge consumers to consumers with enough knowledge to perceive wine quality or recognise certain wines and, finally, to professional experts.

Wine is an 'experience good' in that its quality is unknown before consumption. Thus, a wine expert is not only knowledgeable about wine but also practises wine consumption as a continual consumer. In Italy, wine is a cultural product as well, as the consumption habitus depends on consumer taste, which is crucial in choosing products (Bourdieu, 2005). Wine culture is defined as the capacity to harmonise wine and food and conceive of wine as a nutritional, social and health-related means. In this work, the cultural roots of wine were measured through a 'semantic differential' (Osgood et al., 1957) of wine preferences, which was determined with a rating scale designed to measure the assessors' preferences for wine.

Our basic hypothesis is that wine expertise is causally dependent on cognitive and non-cognitive characteristics of the wine experience, sensorial skills that are relevant to wine assessment and wine consumption culture. To test this hypothesis, we evaluated a convenience sample of consumers to examine the relationships between their self-assessment of wine expertise and qualification of their wine-related training and experience (consumption, production, purchase), their sensorial skills (visual, olfactory, gustative), their enogastronomic culture and their approach to evaluating a set of selected wines. The research data were obtained from an evaluation questionnaire completed by a sample of wine assessors at a tasting experiment which was held during a scientific meeting in Pescara, Italy in September 2018. The sample includes both meeting participants and external experts involved in AIS-Abruzzo, the regional association of chartered sommeliers.

The paper is organised as follows. After this introduction, Section 2 describes the methodological aspects of the tasting experience and introduces the model for data analysis. Then, Section 3 presents the main results of the statistical analysis of the collected data. Finally, Section 4 interprets the data with reference to the mainstream literature on wine expertise analysis.

2. Data and methods

2.1 The tasting experience

In September 2018, a sensory evaluation experiment was conducted on 12 white wines originating from six grape varieties (*Trebbiano d'Abruzzo, Pecorino d'Abruzzo, Passerina d'Abruzzo, Pagadebit di Romagna* and *Pignoletto di Romagna*) from two Italian regions, Abruzzo and Romagna. All wines were controlled designation of origin (DOC) products. The pool of tasters included 48 individuals, of whom 30 typically consumed mild amounts of wine

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(mild consumers), and 18 were professional sommeliers belonging to the AIS-Abruzzo association. Both mild consumers and sommeliers were selected on the basis of their interest in and availability for the experiment as well as their experience in wine consumption.

The wine characteristics considered in this evaluation experiment were selected through an anonymous paper questionnaire. This questionnaire asked participants to make judgements on 11 intrinsic attributes of appearance, nose and palate for four wines that were randomly selected from the 12 at hand. Subsequently, participants were instructed to provide an overall judgement of each wine. The questionnaire also gathered data on the tasters regarding their background characteristics, their drinking habits, and the relevance of wine in their diet and social life. In this work, we confine the analysis to the characteristics of tasters. The characteristics of the assessed wines enter the analysis only as distributional parameters (mean and variance) of the scores which single assessors assigned to the tasted wines.

2.2 The experiment

The experiment involved a horizontal tasting, as it compared only white wines from the same terroir and of the same vintage. On this basis, it is possible to obtain comparative judgements between the selected wines. In accordance with a fractional factorial experiment, each taster was administered four randomly selected wines from different grapes. The sampling of the administered wines was carried out at the grape-variety level. Only four of the six possible varieties were administered to any taster, and one of the two potential cellars was randomly selected. In this case, the experiment sampled possible choices rather than choosers (Manski and Lerman, 1977).

The sampling design followed a systematic pattern such that each grape variety appeared 8 times every 12 trials. Thus, each wine variety had 32 repetitions once 48 tasters had performed their task; consequently, the number of repetitions of each variety by cellar was 16.

Each taster had five glasses: one for water and four for the wines. The wines were poured in a flight. In the tasting session, the judges received 6 centilitres of each of the four randomly selected wine varieties, which were served at the same cold temperature. The protocol envisaged that tasters could taste and re-taste before concluding preferential judgements, and they would evaluate the intrinsic attributes of each tasted wine.

2.3 Analytical model

The model for data analysis includes the self-evaluation of wine expertise as a dependent variable, Y, a set of possible regressors, $\mathbf{X}$, and a set of control variables, $\mathbf{Z}$. The relationship may be written as

$$Y = f(X_1, X_2, X_3, X_4, X_5 \mid Z),$$

where X_1 denotes wine expertise and learning experience, X_2 represents the descriptors of wine habits, X_3 refers to the sensorial skills, X_4 signifies the descriptors of wine-related attitudes and culture, and X_5 is the evaluation style of the tasted wines. The latter was measured through the mean and standard deviation of the scores for the four tasted wines. The underlying hypothesis was that the evaluations by experts would be more critical and uniform than those of nonexperts. The control variables, which were forced into the model, were gender, age and smoking experience. The Y (ordinal) variable was measured on four levels.

The ordinal logistic regression model is written as follows (Agresti, 2002; Bilder and Loughin, 2014):

$$logit \ [p(Y \leq j)] = \beta_{j0} + \beta_1 X_1 + \cdots + \beta_p X_p \quad (j = 1, \ldots, J\text{-}1),$$

where $logit(p) = ln[(p/(1\text{-}p)]$, and β_i measures the relation between Y and X_i when all other variables in the model remain fixed. We adopted the proportional odds model, which assumes that the logit of the cumulative probabilities changes linearly as the regressors change, and the

slope of the relationship between *Y* and the *X*'s is the same regardless of the category *j* of variable *Y*.

A logistic regression model to an ordered response variable was performed with the *polr* function from MASS package (R Core Team, 2021). After that, the *stepAIC* function was utilised to perform stepwise model selection with criterion *AIC*.

3. Results

Of the 48 assessors, five (10.4%) considered themselves to be wine experts, and eight (16.7%) stated that they were able to recognise some wines but did not consider themselves to be wine experts. The majority of the participating sommeliers classified themselves in the latter category. A larger group of assessors (47.9%) indicated that they possessed sufficient knowledge of wine to adequately understand its quality. Finally, 25% of the assessors admitted that they knew little or very little about wine.

Overall, our sample included a group of experts and a group of nonexperts (each accounting for approximately one-quarter of the tasters) as well as a larger, intermediate category of mildly informed amateurs (about one-half of the tasters). Only 3 of the 48 assessors produced or bottled their own wine; the others bought it occasionally or on a monthly basis either at vineries or in supermarkets or wine shops. A few (8.3%) purchased wine through the internet.

Regarding wine practice, about 56% of assessors had been consuming wine for decades, usually with dinner. The majority (54.2%) had attended a wine-tasting session coordinated by a sommelier. One-half of the tasting sample was female, in which the average age was 47. This group mostly had a college degree (66.7%), worked mainly at a university (81.3%) and did not smoke (41.7% had never smoked, and 29.2% had formerly smoked).

Table 1 summarises the results of the regression analysis and presents the estimates of the regression betas and their significance. We highlight the elevated significance of the statistical analysis: $R^2=61.3\%$. To corroborate the regression results, selected covariates are crossed with the self-perceived expertise of assessors (Table 2).

Table 1. Beta estimates of the regression model with expertise level as criterion variable (forward stepwise selection of regressors, n=48; R^2=61.3%; AIC criterion=76.53;
*** $0 < \alpha^{pss} < 0.001$; ** $0.001 < \alpha^{pss} < 0.01$; * $0.01 < \alpha^{pss} < 0.05$; ° $0.05 < \alpha^{pss} < 0.1$; **NS**= Not significant

Regressor		$\hat{\beta}$	$se(\hat{\beta})$	Signific.
Intercept:	Little/Enough	36.816	9.960	***
"	Enough/Recognise	43.605	11.291	***
"	Recognise/Expert	47.767	11.988	***
Male		0.662	0.983	NS
Age		0.121	0.043	**
Smoker		3.806	1.311	**
Self-evaluated olfactory skill		1.220	0.373	***
Buys wine on line		5.535	2.127	**
Buys wine at delicatessen/wine shops		1.890	1.045	°
Buys wine from producers, vineries		3.955	1.475	**
Deals with wines at home		4.159	1.378	***
Wine relevant at celebratory meals		1.407	0.516	**
Wine relevant at dinner		-0.575	0.228	**
Dry *vs*. Sweet (semantic differential)		-0.155	0.231	NS
s.d. of visual evaluations		4.270	1.452	**
Mean of global evaluations		1.056	0.541	°

Note: Some regressors are not individually significant but are significant wrt AIC criterion.

The analysis supports the following claims:

- Wine is a relevant aspect of experts' everyday life, and they are particularly interested in consuming wine at home. While 92.3% of experts decided on wine pairings with meals at home, this figure was only 52.2% and 25% amongst amateurs and nonexperts, respectively. While amateurs and nonexperts collaborated in decision-making about wine at home, their choices were agreed upon with other family members. Hence, the results suggest that the leading role of experts in wine selection starts at home.
- Experts typically buy wine through the internet or at specialised shops. Notably, no producer or bottler self-identified as an expert. Individuals who considered themselves to be wine experts purchased only specific bottles that could be traced through the label to guarantee the quality of their contents. At our trial, all assessors who had bought wine through the internet rated themselves as experts. Moreover, experts purchased bottles from exclusive shops or trusted producers.
- Experts attended at least one sommelier-led tasting course. This aspect corroborates the image of experts as people who have refined their skills by completing courses or tasting sessions in which a qualified sommelier guided them in recognising certain intrinsic attributes of wines (Fabbris and Piscitelli, 2021) and developing their olfactory and tasting capacities.
- Olfactory perceptual ability (smelling) is a fundamental skill of wine experts. The experts were aware that smell is the sense that best qualifies their ability to detect the volatile components of a wine. Accordingly, experts assigned higher ratings to their own olfactory skill compared to amateurs and nonexperts (means: 7.69, 6.74 and 5.25 out of 10, respectively). It is well known that even when wine is in a person's mouth, and they are prepared to activate their palate and throat, the notes and flavours that they experience are partly due to aromas that reach the nose. The data reflect that smelling skills specific to experts include the ability to perceive aromas while drinking wine. Scholars have acknowledged a strong correlation between the two skills, which suggests that olfactory-gustatory abilities constitute a joint skill.

Table 2. Some covariates, by the self-perceived expertise of assessors

Regressor	Self-perceived expertise			
	Expert (n=13)	Amateur (n=23)	Non-expert (n=12)	Total (n=48)
Deals with wines at home (%)	92.3	52.2	25.0	56.3
Buys wine on line (%)	30.8	0.0	0.0	8.3
Buys wine at deli/wine shops (%)	53.8	43.5	25.0	41.7
Attended tasting events led by a sommelier (%)	76.9	60.9	16.7	54.2
Wine relevant at celebratory meals (mean)	9.08	9.13	7.92	8.81
Wine relevant at dinner (mean)	6.15	6.04	5.58	5.96
Wine relevant to socialise (mean)	8.08	7.70	7.58	7.77
Olfactory skill (mean)	7.69	6.74	5.25	6.63
Tasting skill (mean)	7.76	6.78	5.67	6.77
Wine visual evaluation (mean)	7.87	7.12	6.85	7.26
Wine olfactory evaluation (mean)	7.17	6.73	6.65	6.83
Wine taste evaluation (mean)	7.19	6.58	6.67	6.77
Wine overall evaluation (mean)	7.13	6.55	6.69	6.74
Wine visual evaluation (s.d.)	0.73	0.93	0.79	0.84
Wine olfactory evaluation (s.d.)	0.93	0.99	1.13	1.01
Wine taste evaluation (s.d.)	0.83	0.96	1.08	0.95
Wine overall evaluation (s.d.)	0.85	1.20	0.94	1.04

Note: The levels "being wine experts" and "being able to recognise some wines" of the self-evaluation of wine expertise, have been merged into the "Expert" category.

- To identify a person as a wine expert, cultural and psychological traits are less relevant than wine consumption habits. However, when all other variables remained fixed, a significant regressor was the relevance which experts attributed to wine in a foreign celebratory meal. This result implies that experts conceive of wine as a professional rather than social means. During an official meal, not only might a refined wine be served, but experts may also have the opportunity to share and improve their expertise with other connoisseurs. Therefore, while many people drink wine to cultivate happiness together, experts tend to try a wine to understand it and possibly foster appreciation for that wine. This element qualifies an expert as an initiate.
- Experts evaluate wines more accurately than amateurs and nonexperts. Experts significantly outperformed amateurs and nonexperts in both their overall assessment of the tasted wines and their visual, olfactory and gustative scores. The experts' scores for the overall judgement of the tasted wines were 6.6% higher than those of nonexperts. In addition, the experts scored 14.9% higher on the visual evaluations and 7.8% higher on the odour and taste evaluations compared to nonexperts. The scores of the intermediate category, amateurs, were likewise intermediate. The multivariate analysis reveals that, *ceteris paribus*, the experts globally evaluated the tasted wines more highly than the others to a significant degree.
- Through analysis of within-category variability, we also checked if all assessors scored wines at the same level of homogeneity. The results indicate that the visual evaluation scores of experts were significantly more homogeneous than those of the other assessors. In fact, all of the scores from experts were more homogeneous than those from other assessors. Notably, amateurs presented the most variance in wine scoring, which evidences that experts and nonexperts are two compact categories, while intermediate expertise implies a relatively heterogeneous knowledge of wines.
- The semantic differential which was applied to unveil people's attitudes toward wine does not highlight significant differences between experts and other wine lovers. This result reflects that wine is well rooted in Italian food culture and enjoys a high degree of acceptance amongst both experts and nonexperts.

4. Discussion and conclusion

This work has aimed to define the characteristics of wine experts. An expert is a person who possesses in-depth knowledge, abundant experience, a proclivity for vivid imagery and a stronger descriptive capacity than that of other people (Parr et al., 2002; Ericsson et al., 2007; Croijmans and Majid, 2016; Croijmans et al., 2020). A wine expert also demonstrates an acute capacity to recognise, classify and evaluate wine characteristics. Notably, skill training can be particularly effective with practice.

The analysis illustrates that experts assumed a leading role in wine selection, which is a habit that they adopted decades ago and had improved over time. The attendance of specific courses and tasting events led by sommeliers or between-peer contests improved their expertise and self-confidence. An expert clearly seeks to train themself through both the exploration of new sensations and products and the intensification of their sensorial skills.

Furthermore, the data analysis indicates that experts perceive themselves as different from producers and bottlers. For both producers and experts, wine is a professional means as well as an important part of their life. However, producers (should) know how to make high-quality wines, whereas experts approach wine from a position which resembles that of an explorer who is constantly seeking out new land to discover. For experts, such exploration targets unfamiliar sources of sensation (e.g. aromas, bouquets, flavours, terroirs, ages, faults) for themselves and possibly for other initiates as well.

Several experiments have reported the tendency of experts to scout out new sensations. For example, in a study by Mariño-Sánchez et al. (2010), Spanish wine tasters perceived more

odours as intense but fewer as irritating compared to the non-trained healthy population. The identification of wine peculiarities, in particular when practicing the olfactory-gustatory skill, involves cognitive skills. Croijmans et al. (2020) have suggested that expertise entails a heightened ability to imagine hidden structures, thus extending the plasticity of cognition which underlies the chemical senses. On this basis, a wine expert can recognise, discriminate and match the peculiarities of a wine much more effectively than a novice. According to Ericsson et al. (2007), a particular kind of practice – a deliberate practice – is imperative to develop expertise. The practice of wine experts essentially concerns revelation, as they strive to identify elements of wine that were previously unknown or difficult for most people to detect independently. Therefore, a wine expert resembles a member of an uncovered sect or, in more politically correct terms, a highly exclusive professional cluster.

In this study, the experts evaluated the tasted wines more highly than the other tasters, which may be considered an indirect compliment to the people who selected the tasted wines. Moreover, the category of experts displayed significantly less divergence in their evaluation scores compared to those of the other tasters. This finding supports the view of experts as a compact cluster and implies that their judgements of wine are generally more reliable than those of other assessors.

Finally, the findings highlight some differences amongst the evaluation styles of experts. In view of this, future research could consider an analysis of between-expert differences.

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