# *INTRINSIC AND EXTRINSIC QUALITY CUES: THE MODERATING EFFECT OF EXPERTISE ON CONSUMER JUDGEMENTS ON THE QUALITY OF WINES (REFEREED)*

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*Abstract*

The paper addresses the question of the quality cues that are used by wine purchasers in assessing the quality of wines. The general hypothesis of the study is that training, and particularly formal training in oenology, has an moderating effect on the relative importance of these cues in the global assessment of quality. An experimental design compares the grading of six wines by three groups of students: untrained, first year, and second year students in oenology. The cues are taste (intrinsic) and the region of origin (extrinsic). Our results show that the sensory cues have no diagnostic value for untrained students, and become noticeable in the evaluation of wine as the level of expertise increases. They also shed some light on the moderating role of the region of production on sensory cues.

This paper is a contribution to a program of research aiming to determine the role of customers' expertise in their judgements about the quality of wine. The underlying hypothesis is that expertise plays a role in the choice of quality cues that are used and combined by customers. Rao and Monroe (1988), for instance, state that when evaluating the quality of ladies' blazers, female purchasers who are fashion experts tend to rely more on intrinsic cues, whereas less expert purchasers rely more on price. Other research involving country of manufacture as a quality cue indicate that this cue is used differently according to the level of expertise of the respondents (Maheswaran, 1994).

From a practical point of view, we might expect managerial strategies to differ according to the understanding of how the consumer chooses quality cues when purchasing a bottle of wine. In France, it is often said that decreasing consumption is related to a loss of experience and culture in wine, acquired in the past via the influence of family or other social groups. Recent surveys (Laporte and al., 2001) confirm this generation gap in wine drinking habits, and indicate a progressive loss

of interest, and even a distaste for wine, among younger generations. Therefore, for many practitioners in the wine trade, training younger groups of consumers to taste and have a better understanding of wine is one of the ways to economic recovery.

It is, therefore, relevant to have insights into how expertise influences customers' assessments of the quality of wines, and particularly how the wine purchaser deals with some of the cues that are quite specific to wine.

Among these cues, two of them are paramount. The first one is the taste of the wine itself, and the second is the region of origin of the wine. Taste can be considered here as the "intrinsic" cue, the name of the region being the "extrinsic" cue.

Indeed, wine is one food product where quality and price are directly related to taste, probably more so than any other food product. The sensory qualities are scrutinized and graded by international experts, whose grades are put forward by the wine makers (when they appear to be favourable) in order to help to sell the wine. Theoretically, blind-tasting is a guarantee that these grades will reflect the sensory value of the wine. Wine consumers are therefore invited to concentrate on the sensory cue when it comes to choosing and evaluating a wine.

On the other hand, the value of a wine is also related to the characteristics and reputation of its region of origin. At least in France, this is largely based on the belief that a wine's organoleptic qualities are not independent of the soil, the climate and traditional wine-making methods. Thus, over a period of time, regions have acquired reputations and specific images, with subtle hierarchies among the numerous appellations which coexist on the market. The economic effect of this reputation is manifested by the position of the various appellations in the price hierarchy from basic to ultra premium.

In our model we expect the overall assessment of wine quality to result from a combination of sensory judgements and attitudes towards the reputation of the region of origin. However, we expect the consumer's level of expertise to influence the relative importance of these two cues in the overall judgement. This paper is structured as follows. First, we will outline some of the findings from research on quality assessment that explore the properties of sensory cues, and from other research which deals with country and/or region of origin. We will also discuss the

choice of measurement of perceived quality, which is the dependent variable of our model. We will then go on to discuss the concept and the measurements of objective expertise which we will be using. Our results will then be presented and discussed.

## 1. Extrinsic, intrinsic cues, expertise and their measurements

### 1.1. Taste of wine as an intrinsic cue

Although taste is one of the most desired attributes for a food product or beverage, it remains largely ambiguous to the consumer.

In an experiment where consumers are invited in an auction situation to give reservation prices for six brands of champagnes, Lange and al. (2002) show that consumers make almost no differentiation between the products offered in blind-testing. Identical results are obtained when the quality is evaluated with hedonic scores. Differences in reservation prices (i.e. the price a respondent agrees to pay) or hedonic scores (i.e. the global score given by the respondent on a ten-point scale) mostly appear only when the brands are known by the consumers.

Research on the sensory capacities of untrained consumers provides some insights. Human beings as a whole show quite poor performances in characterising their sensory experiences, and even worse when identifying the taste and the odour they are tasting (Laing and Francis, 1989). For instance, in an experiment where untrained consumers are invited to match a set of wines with corresponding sensory descriptors provided by a trained taster, the rate of success is no better than random, except for the wines whose colours are quite different from the others (Couvert and al, 2003). Other experiments confirm that recognition occurs only when the degree of contrast between the wines that are chosen in the experiment is sufficient, and therefore when the sensory cues present little ambiguity (Gawel 1997; Laing and Wilcox, 1983).

Much research seems to indicate also that experts encounter some difficulties in using sensory cues to assess wine quality (Bende and Nording, 1997, Livermore and Laing, 1996). Several experiments using regression models where price is related to sensory and non-sensory cues show that non-sensory cues contribute more to the price variance of the wines than non-sensory cues (Combris and al.,

2000, Landon and Smith, 1997, on Bordeaux wines, Combris and al., 1997, on Bourgognes).

However, most experiments comparing the performance of trained and untrained respondents indicate that expertise increases the ability to discriminate sensory stimuli and their identification (Couvert and al, 2003, Gawel 1997, Bende and Nording, 1997).

Therefore we may hypothesize that expertise should influence the evaluation process. If we follow Rao and Monroe (1988) and Maheswaran (1994), sensory cues should provide more diagnostic information to experts rather than to non-experts. Hence, in the case of trained consumers, we can expect that the sensory cues should have relatively more influence on the final evaluation of the qualities of wine, and that they use this cue to discriminate among wines.

1.2. The reputation of a region as an extrinsic cue

The moderating effect of extrinsic cues on hedonic ratings has been widely demonstrated (Deliza and MacFie, 1996). Looking at cues relating to the country of origin, there is long-standing empirical evidence from research showing correlations between the value of a product and the country where it has been manufactured. Erickson and al. (1984) see it as a cognitive process, where the image of a country influences the beliefs related to particular product attributes. For instance, the value of a car might be higher if it is produced in Germany than if it is produced in Korea. Therefore, the value of a same brand or product category is not the same according to its country of origin. Information about the country of origin of a product generates expectations that moderate the interpretation of other cues (Han and Terpstra, 1989).

We may assume that the reputation of a region could function in a similar way as the country of origin. In the case of wines, it is obvious that some regions such as Bordeaux perform just like brands, and are perceived as such by many consumers (Boulet and al., 1996). Brochet and Morrot (1999) have shown that a same wine can be graded differently by experts according its alleged origin. As we have seen before with Combris and al. (1997, 2000), hedonic scores obtained on wines are explained more by the characteristics of the region of origin than the sensory variables of the wine. As a matter of fact, most wine makers tend to associate a region name with their brand.

Quite recently, attention has been focused on the region of origin and the way it influences the perception of products' quality, particularly in the case of food products. Van Ittersum (2001) tests a structural model of attitudes towards beers and potatoes. As is the case for country of origin, his model indicates that the image of the region of production has a direct effect on the attitude towards the regional product, but also an indirect one, as it influences the perception of the product attributes, which in turn influences the global attitude towards the product.

However, the process seems to work only when the image of the country of origin is specific, that is, when the country can be associated with the product category by the consumer. For instance, the general and positive image of Switzerland for its quality products may not be easily extended to wines by consumers. In this case, the quality attributes of Switzerland might not be relevant for consumers who are not aware that this country is a wine producer (Chaney, 2002).

We can expect, therefore, the name of the region of origin to influence the perception of the quality of the wine. We may hypothesize that consumers will use this cue more easily if the region is well known to them as a wine-producing region.

1.3. Expertise of consumers

As we saw previously, quality cues are used and combined differently according to the consumers' level of expertise. According to Rao and Monroe (1988), less knowledgeable consumers use naïve inferences between intrinsic and extrinsic cues. For instance, they will use price, or the reputation of the region, as a quality cue. Highly knowledgeable consumers will use extrinsic cues in a more discriminating way, according to the context provided by the cue (Raju and al., 1995). For instance, a sensory profile may be judged as acceptable for a wine from a given region, but less acceptable for another.

The question needs to be asked regarding the definition of an "expert". Looking at the literature, we may consider an objective and a subjective definition of expertise.

Objective expertise may derive from formal training, such as specialized courses in schools for oenologists or cellar keepers in restaurants. Such programs provide knowledge of regions of production as well as training in sensory analysis. At the end

of a course, an expert is expected to be able to identify sensory components and associate them to vine varieties, wine making practises and regions of production. Therefore, when assessing the quality of a wine, the expert is able to rate the wine objectively, that is, independently from his own preference, and in relation to other cues.

Another type of objective expertise could derive from familiarity with the product. For instance, frequent consumers of wine might acquire enough drinking experience to be able to combine cues in a contextual way. There is evidence that frequency of consumption of a particular food or beverage explains preference, as shown by d'Hauteville and Perrouty (2000) on milk consumption.

Subjective expertise describes a state of an individual who perceives himself to be more knowledgeable than most of his peers. It is likely that an expert with formal training, who is a reasonably frequent wine drinker, would describe himself as an expert. However, frequent drinking may not be sufficient for an individual to qualify himself as more expert than his peers. Subjective expertise is a personality trait and is largely dependent on the way an individual perceives himself. D'Hauteville and Goldsmith (1997) found a close correlation between self-expertise and the scores obtained by students from three nationalities in a 12- question multiple choice test on wine knowledge.

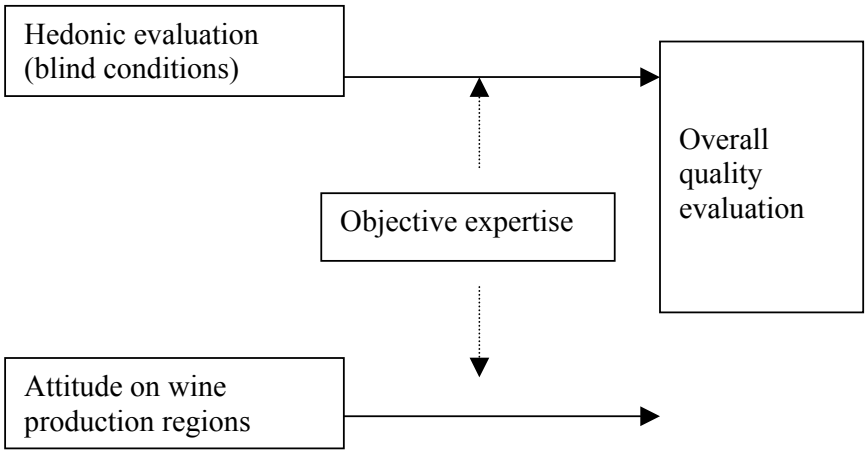
Aurier and Ngobo (1999) investigated 4 dimensions of expertise in wine: familiarity, objective knowledge, objective expertise, and self-expertise. They found that, relative to objective knowledge, subjective expertise is a better predictor of the type of cues consumers use to make a choice. Non-experts tend to use non-functional attributes, like the price, while experts tend to use functional attributes. But, as in most studies, the sets of questions that measure "objective expertise" contain only general knowledge about wine (such as relating a type of wine to a region), but do not allow for the ability of respondents to make analytical judgements about taste, or identify sensory cues with specific regions.

All these results suggest, therefore, that these definitions of expertise are not equivalent and may influence in different ways the evaluation of the quality of a wine. For this reason we might use different measurements for these two different concepts. However, our experimental design includes two-thirds of individuals who benefited from formal training in wine tasting. We could expect to find a high level of

correlation between objective expertise and subjective expertise within this group. Moreover, it is easier to assess the different levels of training leading to expertise, which would allow us to measure the efficiency of training programs. Therefore we will use objective expertise as the only discriminating criteria among the sample group.

**2. The model and the measures**

2.1. The model we will be testing is as follows (fig 1):




The hypothesis is that overall quality evaluation is an additive combination of :

- Hedonic evaluation
- Attitude towards region
- Influence of expertise on the hedonic-overall evaluation relationship
- Influence of expertise on the region-overall evaluation relationship.

2.2. The measures

We use a 10-point hedonic scale (1 to 11), which is a traditional measurement in situations where consumers are asked to give a score to indicate their hedonic perception of the quality of a product. We use the same scoring scale to measure the attitude towards the region of origin, as well as the taste of the product.

We measure objective expertise using different levels of formal training in oenology, a discipline where students are trained to analyse the sensory components of wine, and relate them to the characteristics of the regions of production. We are able to include this data in our experiment, as the engineering school in Montpellier offers a Diploma in Oenology, which lasts two years. This enables us to use three different levels of objective expertise: Students who had no formal training (TRAIN 0), first year students in oenology (TRAIN 1) who had benefited from one semester of courses and approximately six tasting sessions, and second-year students who had had three semesters of formal training with over 20 tasting sessions at school and in various wine areas in France (TRAIN 3). It is also expected that these trained students would have participated in numerous extra-curricular tasting sessions.

The hypotheses to be tested can be presented as follows:

1. The overall assessment of wine quality depends both on extrinsic and non-extrinsic cues, for both trained and untrained consumers
2. The level of training in oenology has an influence on the model
3. Trained consumers tend to rely more on intrinsic cues (taste) than on extrinsic cues (region)
4. To untrained consumers, a region with a high reputation has a greater effect on hedonic evaluation than a lesser known region. Therefore, the change in scores between blind and non-blind tasting should be higher when the region is well known

2.4. Experimental design

Sample: 62 students were chosen among the first and third-year students at the Engineering School of Agronomy in Montpellier. The age spread was about three years, with an average of 22, divided between 29 males and 33 females. The group was split into three levels of training: no training at all (n = 19, six subjects who said they had benefited from some kind of training were excluded from the sample), one year of training (n= 27), and two years of training (n = 16).

Five wines from different regions in France were chosen, from well-known to unknown. In this choice, we assume that some regions benefit from a well-established reputation (St Emilion, Beaujolais), some others are both smaller and lesser known regions (Crozes Hermitage, Gaillac, Fitou).The evaluation of reputation

relates, of course, to the students who have no training and therefore these untrained students are considered to be quite unaware of the smaller and more recent appellations. It was expected, however, that most trained students would be familiar with all these names.

We chose retailers' branded products (Pierre Chanau from Auchan), on the assumption that they would use the same "average" or "standard" quality criteria for each appellation. We thus hoped to conduct the experiment on a homogeneous set of wines in terms of their positioning.

The experiment consisted of three steps.

Step one: the respondents were invited to the tasting room of the School of Oenology to taste the five wines, placed on the tables just before their entrance, and identified with three-digit random numbers. The glasses were arrayed randomly, in order to avoid an order effect (tasters will tend to test the wines from right to left, for instance). The wine glasses were filled on the table prior to the respondents' arrival. The respondents were therefore able to test the wine as many times as they wished. They completed a questionnaire containing the 1 to 11-point hedonic scale, and provided some analytical assessments on the different sensory dimensions of the wines (this data is not detailed in this paper).

Step two: the respondents moved to another room and completed a short questionnaire, providing personal details, levels of wine consumption, the self-expertise scale (this measure is not used in the test). Some questions were obviously redundant in order to keep the respondents sufficiently occupied with this task. Indeed it was important that respondents did not memorize the taste of the wines for the next experiment. It was also necessary to change and refill the glasses.

Step three: back to the tasting room, the respondents tasted the wines again, this time with the name of the region of origin associated with the wine, and graded them again on the 1 to 11-point scale.

The whole experiment lasted about 30 minutes.

## 3. Results

Hypothesis 1: The overall assessment of wine quality depends both on extrinsic and non-extrinsic cues, for both trained and untrained consumers.

Hypothesis 2: General assessment of wine quality is influenced by the level of training in oenology

Table 1 indicates that the variance of the dependant variable is explained by each of the variables. Clearly, this means that both the score given to the region and the hedonic score influence overall quality assessment. Thus, hypothesis 1 is valid. We also find that terms of interaction between these cues and objective expertise are able to explain a significant part of the variance, which means that the influence of region of origin and taste on overall quality assessment are significantly moderated by the expertise of the consumer. Thus, hypothesis 2 is also valid.

**Table 1: General assessment model: wine grading as a function of region and hedonic assessment and training in oenology ($R^2$=.896)**

| | F value | Signification |
|---|---|---|
| General model | 338.782 | .000 |
| Region score | 233.139 | .000 |
| Hedonic score | 106.323 | .000 |
| Region score * training | 8.678 | .000 |
| Hedonic score * training | 5.412 | .001 |

Hypothesis 3: The trained consumers tend to rely more on intrinsic cues (taste) than on extrinsic cues (region).

We performed regression analyses for each of the three groups (untrained, one year of training, two years of training). Table 2 shows that the model is quite different for each group.

Students with no training tend to rely essentially on their evaluation of the regions to grade the wine. In contrast, students with two years of training rely on sensory cues, whereas students with one year of training rely on both cues, with more emphasis on

**Table 2: Global grading of the wines, as a function of region and hedonic grading, for each of the groups**

| | No training (n = 19) $R^2$=.300 | 1 year training (n = 27) $R^2$=.283 | 2 years training (n = 16) $R^2$=.143 |
|---|---|---|---|
| | $\beta$ values | $\beta$ values | $\beta$ values |
| Global grading – region grading | .548 (.000) | .237 (.002) | .131 (.233) |
| Global grading – hedonic grading | .180 .052 | .465 (.000) | .378 (.000) |

hedonic cues than on their opinions about regions. Hypothesis 3 is therefore valid. Moreover, these results suggest that the longer the training is, the more important the use of intrinsic cues is.

## 4. Discussion

As expected, the global judgement of the wines relies on both intrinsic and extrinsic cues.
Obviously, however, these cues are not used in the same way, depending on the respondents' level of expertise.

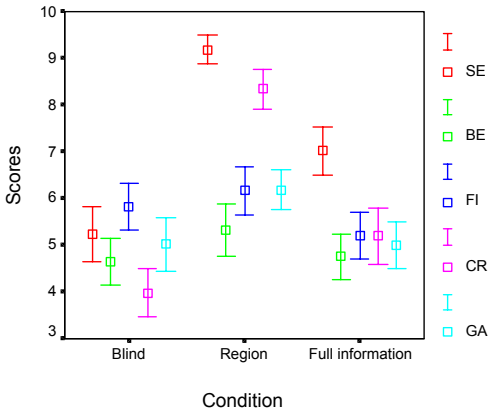
When the level of training (or self-expertise) increases, respondents tend to rely on their own hedonic judgement, as if the importance of the region of origin as a quality cue decreases. Indeed, in our experiment, the students who were trained to a higher level seemed to take no account of the region. It also suggests that intrinsic cues are less ambiguous to expert students, which gives a diagnostic value to this cue (Maheswaran 1994).

The following set of graphs supports this analysis and sheds some light on the moderating role of the extrinsic cue.

**Fig 2: Sensory scores, region scores and overall score given to five wines by three groups of respondents**

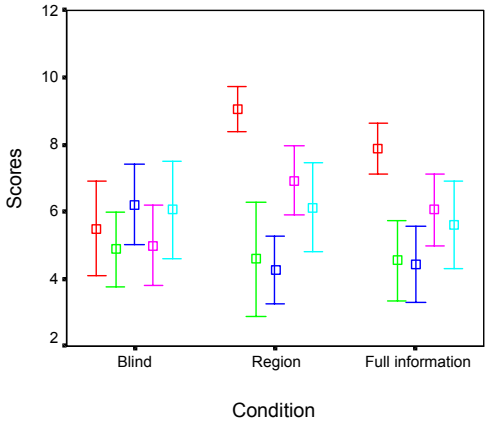
Overall Judgment

Overall sample



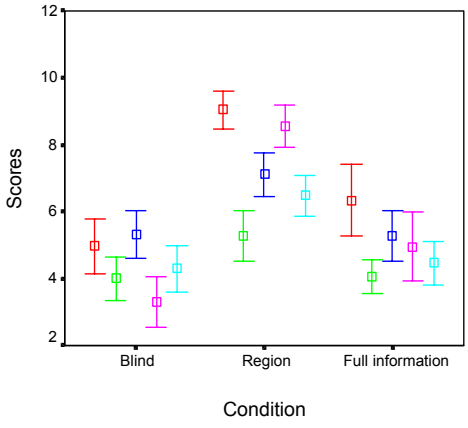

Overall Judgement

no training



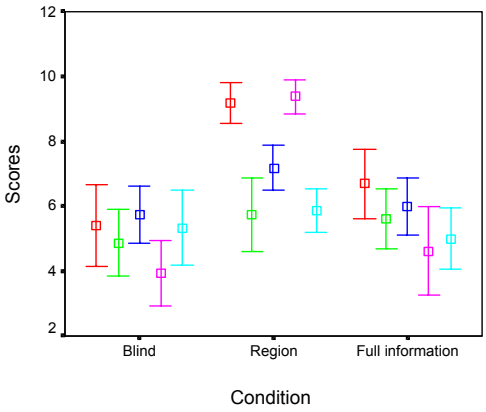

Overall Judgment

1 year training




Overall Judgement

2 years training




se=st emilion, be = beaujolais, fi = fitou, cr = crozes hermitage, ga = gaillac

At first sight, the three sets of scores (blind, region and full information) look quite comparable for the three groups of respondents.

However, there are quite noticeable differences between the untrained and the trained groups.

For all groups, the spread of scores on blind tests is not as wide as that obtained on regions and full information scores. A closer analysis (a *t* test on score differences) shows, however, that the difference between the blind scores in the untrained group is not significant. In other words, this group of untrained students is unable to discriminate between the wines in a blind test. The same *t* test applied to the expert students' scores proves significant, indicating that taste helps them to make their choices.

The scores on regions have a much wider spread than the blind scores for the three groups. As anticipated, the evaluation of St Emilion and Crozes Hermitage stands out in all three groups, although St Emilion is more dominant within the untrained group. Conversely, the reputation of Beaujolais also appears to be quite negative in the three groups. It is interesting to note in this particular case that a high level of reputation may not coincide with a positive image.
Fitou, a recent and small region of production, does not have a positive image for the untrained students, but does seem to have a positive image for the trained students. Gaillac, a small but not recent appellation, is evaluated by untrained students at the same level as Crozes Hermitage (also a small region), but at a much lower level by trained students.

The image of the regions clearly influences the intensity and the direction of the score obtained by the wine when all information is available. It moderates the assessment of intrinsic cues, which supports Han and Tepstra's findings in a country of origin context. However, it is difficult to separate the cognitive and the affective part of the image in the analysis of this effect (a well-known region may not be associated with high quality).

Table 3 shows the variation of scores obtained by the wines between the first and the second test, within the three test groups. These variations of scores appear to be significant only for three wines: St Emilion, Crozes Hermitage and Fitou.

**Table 3: A"t" test on the difference of scores (blind and full) according to expertise levels**

| | Train 0 | | | Train 1 | | | Train 2 | | |
|---|---|---|---|---|---|---|---|---|---|
| | Score diff | t | sig | Score diff | t | sig | Score diff | t | sig |
| St Emilion | 2.33 | 4.507 | .000 | 1.27 | 3.284 | .003 | 1.25 | 2.660 | .018 |
| Crozes Hermitage | - 1.11 | -1.597 | .128 | 1.68 | 4.086 | .000 | -.80 | -1.065 | .305 |
| Gaillac | .63 | .665 | .514 | -.19 | -.440 | .663 | .25 | .553 | .588 |
| Fitou | -1.67 | -2.945 | .09 | .07 | .179 | .859 | .19 | .351 | .730 |
| Beaujolais | 0.26 | 3.80 | .708 | .04 | .140 | .890 | -.75 | -1.307 | .211 |

Looking at the influence of the St Emilion cue on the final score, Table 3 indicates that the mention of this region enhances the hedonic scores significantly for all drinkers, experts or not. However, the difference between the full and blind score decreases with the level of expertise, from a 2.33 pts increase for the untrained group, to 1.25 pts for the highest trained group. In this particular case, the cognitive and affective dimensions of the perception of this region seem to be congruent with the view of all respondents.

Looking at the influence of the Fitou cue, this region seems to generate a negative expectation in the non-consumer group, because the hedonic score is significantly downgraded. In this case, we may hypothesize that the affective dimension of the image does not work, as long as the name of the region is not even known. Therefore, if a region is not known as a wine-producing area, the moderating effect of the region may be negative.

With these two wines we find a good illustration of the concept of "sensory expectation", which has been explored in the marketing literature dealing with

unfamiliar objects and situations (Tuorila et al.,1998). More specifically, we may observe an moderating effect of “assimilation” (when the sensory evaluation is amplified by the extrinsic information) or “contrast” (when the adjustment is opposed to the extrinsic evaluation (Schifferstein, 1996)).

In our experiment, all wines might be considered to be unfamiliar when tasted in blind conditions. A well-known brand with a positive image (St Emilion) supports the sensory score, an unknown brand deserves the sensory score (Fitou). The latter example shows that it is not enough for the wine to be the best in blind tests (indeed, we can see that this wine is consistently rated higher in the blind tests).

Clearly, region as an extrinsic cue functions quite differently according to its reputation. In this respect, the score differential between full and blind in our experiment can be interpreted as a measure of “region of production equity”.

**Conclusion**

Our research confirms that the use and combination of extrinsic and intrinsic cues when evaluating the quality of a wine differ according to respondents’ level of expertise. It suggests that the moderating role of the region operates very much like the country of origin.

The results support previous findings showing that intrinsic cues have diagnostic value for experts, and much less for non-experts. In our experiment, sensory cues are useful to the expert to assess the quality of a wine, but not to the untrained students.

It is interesting to note that the combination of cues is also dependent on the amount of training. The model is different for the three levels of training (no training, one semester and three semesters of training). The question arises then concerning the minimum level of training required to enable an individual to use the intrinsic cues in the diagnosis of the quality of a wine.

We also provide evidence that extrinsic cues have stronger diagnostic value information than intrinsic cues. This is particularly true for untrained consumers.

Our results also suggest that the moderating effect of the region as an extrinsic cue depends on how it is evaluated by the consumer. The name of the region produces assimilation effects only when it is both well-known and favourably perceived (St Emilion). When it is unknown, not specific or poorly rated, the assimilation is not perceptible (Beaujolais), or produces contrasting effects (Fitou).

However, in our experiment, the evaluation of the region results from a unique score, which measures both the cognitive and the affective dimensions of the image of the region. Therefore, further research should take into account both dimensions.

If we can overcome these limitations, we suggest that this type of experiment could be used to measure “region of origin equity”.

It is clear for management purposes that some regions producing good wines will acquire value only if they invest heavily in these two dimensions: reputation and image. In the case of Fitou, for example, the lack of investment in the region’s name clearly prejudices the good intrinsic quality of the wine. Of course, one way to create a strong image is to develop wine tourism. This type of venture requires strong collective action, combined with personal dedication, and concerns wineries, which are both small and artisanal and those on a much larger scale. For small regions, it may be an efficient, though cheaper alternative alternative to advertising.

Another managerial suggestion is that wine makers should invest in research into wine training and its effects on the perception of wine quality.

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