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Wine Descriptive Language Supports Cognitive Specificity of Chemical Senses

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In order to understand wine perception we analyzed tasting notes of four expert wine tasters. The analysis is based on co-occurrence calculations of words within the tasting notes using ALCESTE software. The results of such an analysis of one subject's notes give us word classes reflecting main text ideas and organization of the text. In the present paper we interpret these ''results'' as follows: (1) Class number and organization are different among experts so that each expert has his own discourse strategy. (2) Wine language is based on prototypes and not on detailed analytical description. (3) Prototypes include not only sensory but also idealistic and hedonistic information. These results are in agreement with recent neurophysiological data.

Key Words: wine; representation; prototypes; right hemisphere; chemosensory; description; tasting; experts; hedonistic.

INTRODUCTION

Few common foods are described verbally and systematically. Wine is one of the more often described foods, and wine literature is widespread with numerous journals, books, and reviews being presented to the public and experts or professionals. People who fail in describing wine flavors, i.e., who cannot speak about its taste in a professional manner, usually consider themselves as ''not knowing anything about wine.'' A question can then be posed as to whether this means that knowledge requires language. Winemakers, professional critics, enologists, and amateurs have built a wine language or vocabulary that they use to describe sensory properties of wine. They use it to exchange sensory data among themselves and to analyze their information for other uses, for example, to determine the way that wine should be managed in the future to acquire a specific taste. Tasting notes also often accompany advertising documents or price lists. These notes are destined for the general public and should have a sense of the professional meaning of the wine vocabulary which should help individuals to appreciate the quality and the sensory values of a given wine.

Although many efforts have been made to characterize the quality and flavor of the compounds in wine by gas chromatography and other chemical techniques, tasting remains the single universal test used to assess properly wine sensory properties. This is because the taste of a molecule, or of a blend of molecules, is constructed within the brain of a taster. It is a complex recognition of different properties which

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integrates many aspects of the sensory faculties of an individual. Such information is not contained entirely in the physicochemical structure of the complex molecular structure of a wine taste. For example, it is known that the perceived flavor of a blend of two molecules is rarely the combination of the two flavors but usually a third flavor which is not predictable from the two initial ones.

In wine tasting, nonconnoisseurs are often impressed by professional tasting notes which describe many flavors in what usually appears to a novice simply as ''the flavor of wine.'' Thus professionals use analytical descriptive terms where each sensory property (i.e., banana smell and strawberry aroma) is described separately, instead of using a prototypical ''general perception'' term which would compare wines between themselves in a more global way. Most often such information is not a quantitative description analysis (QDA) (Noble, 1987), where a limited number of pertinent terms are used to describe food and where each term is associated to a number which quantifies the intensity of the descriptor. In usual wine tasting procedure, tasters pay more attention to flavor quality (in the meaning of nature) than quantity. Only quantitative terms such as *very* or *few* have a quantitative function. Furthermore, wine tasters use many hedonistic terms such as *nice*, *good*, and *fine* that are not used in QDA methods. All wine tasting books as well as teaching academies' recommendations suggest that the taster must describe sensory properties in a precise order. They recommend describing the wine in a sequence, beginning with its visual aspects, followed by olfactory aspects, and finally tasting and somesthesic aspects.

QDA and, to a lesser extent, free description postulate that in using words the brain can make categories of flavors so that a single word will in fact designate many sensations. Although this has been demonstrated by Rosch (1976), for the physical world, no assessment has been made for the chemical ones. Laing (1989) demonstrated with perfumers that experts were not able to properly describe odors contained in a blend of more than two chemical molecules.

Concerning wine, several publications (Lehrer, 1975; Peynaud, 1981) have addressed the content of wine language only from a lexical point of view, and very little information is available on wine language structure. Nevertheless, Lahlou (1991) used free answers to the question ''What does good food mean for you'' to demonstrate that the co-occurrence of words in answers contains information concerning the representation of food in a French population. He observed that co-occurent groups of words (i.e., words appearing often together in the same sentences) were interpretable in terms of patterns of eating behavior and also in terms of the social representations of eating habits in France. If this is applied not just to the description given by different individuals of the same object (the same question to many different people) but to individuals describing different objects of the same sort (for example, one professional taster tasting several thousand wines), one would expect to determine the organization of language related to this subject and thus the perception of wine to an individual.

Our question then is how do wine experts proceed to describe so many fragrances in wine? Are the many terms used unconnected or are they in fact associated to describe a more general impression, as is the case for unprofessional persons. We use here information which is presented for professional or mass consumption, i.e., for nonprofessional wine tasters. It represents a synthetic appreciation of the qualities of wines which should be communicated between experts or to the general public.

METHODS

Wine Description Corpuses

Four corpuses of wine tasting have been analyzed. They all come from well-known sources, recognized for their competence. Three of them were written in French and one in American English. They all

Corpus H (40000 Notes). Language : French.
*01113 *Estate_Domaine Tourot *Vintage_1990 *Area_Chambertin *Color_Red *Rating_4*
Napoleon arrives behind Bonaparte. More intense than limpid, keeping its young nose, but already suggesting wildness, soft, managing an exclusive spirit, this 90 will one day be the sun of Austerlitz. It is rare to see a wine resolving so many contradictions with such a success.

Corpus G (4000 Notes). Language : French.
*00489 *Estate_Château de Grezan *Vintage_1991 *Area_Faugères *Color_Red *Rating_14*
Deep violet. Fine, a lot of fruit, blackcurrant, violet, bitter orange barks, black chocolate. Soft, round, young tannins but still fine, balanced, light body but still present, fruity finish.

Corpus F (2000 Notes). Language : French.
*01113 *Estate_Leoville Las Cases *Vintage_1985 *Area_Saint-Julien *Color_Red*
Rating_16
Intense, spicy, woody, cinnamon and pine. Superb, intense and very evolutive. Round, full and velvety. Very Long. Excellent, a Bordeaux reference. Drink it now.

Corpus P (10000 Notes). Language : American
*01258 *Estate_Domaine de la Casenove Garrigues * Vintage_1993 *Area_Cotes du Roussillon *Color_Red *Rating_85*
Primarily a Grenache/Carignan blend that is Domaine de la Casenove's answer to Beaujolais. This medium bodied round, fruity, vibrant exuberant wine is the type of uncomplicated but delicious red wine that bistros should be serving by the glass. There is plenty of peppery, cherry fruit in this supple wine.

FIG. 1. Examples of each corpus. This represents the notes as they were analyzed. ''Label words'' are on the first line and are always preceded by a star. The note written by the author about this wine is just under it. One notice the very different style of the tasters.

contained many tasting notes for many different types of wines: white wines as well as red or sparkling wines, young and old.

Corpus H was produced by the editor of a very popular European wine guide using a numerical format of a text extracted from a database. It contained more than 40,000 tasting notes of only French wines from all wine-growing areas. This was a compilation of 10 years of tasting in France. These tastings are organized according to the wine origin and then written in book form by three or four people.

Corpus G was from a professional wine writer, mainly read by professionals. Three years of tasting resulted in a compilation of 4000 tasting notes. Thanks to the author, this corpus was also available in a numerical text format, which we modified for analysis.

Corpus F was from a private taster who wrote down tasting notes on a portable computer. This database contained slightly less than 2000 tasting notes, written over 2 years of tasting.

Corpus P came from a well-known American wine writer who publishes tasting notes every 2 months. We purchased the database of 10 years of tasting notes, commercially available from Wine Technologies and we extracted 7000 out of 11000 tasting notes from it.

All corpuses were organized in the same way for the analysis, with each note labeled with several attributes, such as the name of the grower, the vintage, and the eventual rating, which are listed. Figure 1 presents one note from each corpus.

One last corpus was made by compiling 1000 notes from the author of each corpus (for a total of 4000 tasting notes). This was to check whether common points eventually noticed in separate analyses were confirmed in a compilation of the notes.

Lexical Analysis

Tasting results were analyzed using ALCESTE software (Image Ltd., Toulouse, France), created by Reinert (1986). Its algorithm is based on χ^2 calculations of co-occurrences of words in a text. The software lists all the dictionary roots of words present in a text. For instance, plurals or conjugates of verbs would be reduced to their root: ''done'' will become ''do'' and ''herbs'' will become ''herb.'' We consider that the sense of the word is more important than its grammatical use. Building a huge matrix, the system counts how many times one word is used together with another and calculates the χ^2 value of this result

(the probability of the word being used with the other word). Next, it forms groups of words, called lexical fields, that reflect a text's inner organization. At no stage does the software take into account the sense of the words. This is done only by the experimenter at the end of the analysis. The results present the lexical fields with the list of terms in the field and the χ^2 value of association to this class, with the occurrence of the word in the text analyzed and in the context of the sentences using other words of the class. The output also associates classes to ''label words'' (color or vintage) that are not taken into account in the analysis because they are set up by the experimenter and give information about the object to be described. Nevertheless, they can be a useful tool in understanding the composition of the classes. When the taster talks about vintage or growth in the notes, this is of course taken into account for the analysis. The software allows the experimenter to fix analysis parameters such as the number of words per sentence analyzed and the minimum χ^2 value for a word to be placed in a certain class. According to Reinert (1990), strong text inner organization is revealed; however, these parameters are adjusted. Thus, the results presented here were equivalent from one series of parameters to another. Large corpuses such as G and P were reduced by random selection from a maximum of 5000 tasting notes. We have found that the results obtained using more than 1000 tasting notes are not significantly different from each corpus than those obtained by the program.

RESULTS AND OBSERVATIONS

Figure 2 represents all lexical fields provided by ALCESTE for the four individual corpuses. Each analysis differs in both the number of classes and the nature of these classes. Each class has been interpreted with a word which summarizes its content but that is not given by the analysis itself. They are globally appropriate designations of the class but this is already an interpretation of the class by the experimenters.

The results show that Corpus H presents four lexical fields, only two of which are truly sensory descriptive (fields 2 and 4). The remaining two fields associate descriptive terms which do not rely upon wine sensory properties but on the winemaker, or specific technique, and other nonsensory factors such as general appreciation (*honest*, *perfect*, and so on).

Corpus G gives five lexical fields, two of which are devoted to white wines (fields 4 and 5). Three fields are devoted to red wines. Each class can be related to a type of wine: old wines, light wines, rich wines, sweet wines, and dry wines. This is deduced not only from words of the class but also from ''label words.''

Corpus F possesses six classes, four of which are devoted to red wines and two to whites. Half of the classes are devoted to wines the taster obviously likes (fields 3, 4, and 6) and the others to wines he dislikes.

Corpus P has only three fields which are very disparate. One deals with white wines, and the two others separate appreciated red wines from nonappreciated.

In looking at most of the word fields it is clear that they mix together visual (*brown*, *purple*), olfactory (*apricot*, *pear*), taste (*acidic*, *sweet*), trigeminal (*tannic*, *hot*), hedonistic (*great*, *good*), and idealistic (*honestic*, *personality*) descriptive terms which cannot all strictly be considered to be part of a tasting vocabulary.

Some striking things can be observed in these lists of associated words used to convey taste sensations among professionals or to the public at large. Initially it is clear that each taster uses word associations specific to his knowledge or sensations. In Corpus H only 34% of the words are common to the others; in Corpuses G, F, and P, 32, 27, and 23%, respectively, are common to other corpuses. This indicates that the vocabulary used to describe wines is somewhat distinct in the associations of each expert. Only two terms, *dark* and *black currant*, are common to three corpuses. In Corpus H only two of four fields are devoted to taste sensations (fields 2 and 4); in Corpus P it is only one in three (field 3). For the fields containing clear taste terms, none contain only strictly sensory terms. For example, in Corpus G (field 4) terms such as color (*gold*) are mixed with flavor descriptors (*apricot*, *honey*). For the entire lists of words the majority are not taste or olfactory sensory oriented. In

1. a. Corpus H

Field 1 : Hedonistic	Field 2 : Red	Field 3 : Chateau	Field 4 : White
Burgundy (i)	Fleshy (s)	Growth (i)	Gold (c)
« Clos » (i)	Final (t)	Wood (o)	Floral (o)
Climate (i)	Dark (c)	Château (o)	Fresh (t)
Heart (i)	Intense (o)+ (c)	Complexity (i)	Sweet (t)
Body (i)	Deep (c)	Brand (i)	Pale (c)
Honnest (i)	Blackcurrant (o)	Substance (s)	Dry (t)
Bottle (i)	Cherry (o)	Property (i)	Apricot (o)
Pleasure (h)	Fruit (o)	Structure (s)	Lemon (o)
Perfect (h)	Rubis (c)	Volume (s)	Honey (o)
Feeling (i)	Raspberry (o)	Personnality (i)	Hay (o)
Style (i)	Spice (o)	Success (i)	Crisp (t)

1.b. Corpus G

Field 1 : Old	Field 2 :Texture	Field 3 : Nice	Field 4 : Gold	Field 5 : Fresh
Brown (c)	Ripe (o)+ (c)	Nice (i)	Gold (c)	Floral (o)
Spyci (o)	Soft (s)	Fruity (o)	Full (s)	Fresh (t)
Matured (o)+ (c)	Blackcurrant (o)	Pleasant (h)	Long (o)+(t)	Pale (c)
Dark (c)	Black (c)	Cherry (o)	Fat (s)	White (c)
Chocolate (o)	Extracted (s)	Redcurrant (o)	Apricot (o)	Acidic (t)
Cedar (o)	Tar (o)	Rubis (c)	Coince (o)	Butter (o)
Pine (o)	Substance (s)	Raspberry (o)	Honey (o)	Lemon (o)
Tabacco (o)	Marmelade (o)	Supple (s)	Walnut (o)	Apple (o)
Tuiled (c)	Muscle (s)	Tender (s)	Peach (o)	Box-Wood (o)
Smoky (o)	Round (s)	Light (s) + (c)	Pear (o)	
Brics (c)			Grilled (o)	

1.c. Corpus F.

Field 1 : Light	Field 2 : Powerfull	Field 3 : Thinn	Field 4 : Old	Field 5 : Good	Field 4 : Not so good
Fruity (o)	Dark (c)	Hard (h)	Oxydised (o)+ (c)	Gold (c)	Honey (o)
Redcurrant (o)	Blackcurrant (o)	Vegetative (o)	Dry (t)	Butter (o)	Worm out (o)
Sugar (t)	Excellent (h)	Thinn (s)	Tabacco (o)	Fat (s)	Wax (o)
Balanced (t)	Meaty (o)	Acidic (t)	Smoky (o)	Pear (o)	Cuppery (c)
Woody (o)	Spicy (o)	Strange (i)	Old (o)+ (c)	Hay (o)	Aged (o)+ (c)
Strawberry (o)	Tannins (s)	Volatile (o)	Tissue (o)	Bred (o)	Rag (o)+ (c)+(t)
Open (o)	Prunes (o)	Sad (i)	Stripped (s)	Flowers (o)	

1.d. Corpus P

Field 1 : Good	Field 2 : Not so good	Field 3 : White
Great (h)	Amber (c)	Floral (o)
Amazing (h)	Closed (o)	Clean (h)
Blockbuster (s)	Earth (o)	Delicious (h)
Enjoy (h)	Cedar (o)	Fresh (t)
Outstanding (h)	Dusty (o)	Dry (t)
Elegance (h)	Tannins (s)	Crisp (t)
Profound (o)+ (c)	Herbs (o)	Pleasant (h)
No filtration (i)	Jammy (o)	Varietal (o)+ (t)

Words categories : (i) idealistic, (o) odor, (c) color, (s) somesthesic, (t) taste, (h) hedonistic.

FIG. 2. Lexical fields obtained for each author.

Corpus H 30% are related to taste sensations; in Corpuses G and P, 49 and 23%, respectively, are taste related. Only in Corpus F does one find a majority of taste- or olfactory-related terms in the word associations. In looking at the associations it is clear that each taste descriptive field includes other sensations or observations and these sensations or descriptive terms are not necessarily strictly related to the problem of describing taste sensations of the wines. This suggests that an associative system is being used by each expert to describe the wines.

DISCUSSION

All professional tasters report that they taste ''analytically'' and that they try to describe wine sensory properties independent of the opinions of other experts. They consider that they are not influenced by the color of a wine when describing the aroma, nor by the taste when describing the odor. We would then expect wine language to be essentially organized around the different senses implied in tasting: sight, nose, taste, and somesthesia. If each wine stood alone, it would have a series of different qualities of taste which would form a field and if enough different wines had these qualities a general field would be detected by the program used. Thus if some Bordeaux wines were sufficiently similar they would form a taste field with tasting qualities that would be detected by the analysis. If a taster uses a general description to distinguish a type of wine (a light white wine or a heavy bodied red wine), these types will show up despite the variety of wines tasted and the variety of words used for description.

Wine Language Is Based on Prototypes

No author has produced a wine descriptive language which could be considered to adhere to a strictly sensory analytical model, i.e., using sight, olfactory, and taste terms, which is descriptive of a specific wine. The lexical fields determined above always contain almost one visual descriptor (*dark*, *gold*), one olfactory descriptor (*honey*, *raspberry*), and one taste discriptor (*crisp*) in such a manner that the word group can be associated to a type of wine. All wine descriptive language is in fact organized around wine types which we call prototypes. If this is in fact correct, what a wine taster does in front of a wine is not an analysis of its separate sensory properties but a comparison of all the cognitive associations he or she has from the wine (color, initial aroma, and taste) with the impressions he or she has already experienced when tasting other wines. When the taster speaks of a specific wine describing flavors, he or she mainly uses a series of words he or she has used previously for this category of wine and is not describing the specific wine. If specific wines were described independently there would be many more word groups or, in the best of cases, none at all. The terms in fact used by the tasters might have been learned or constructed to suit the opinion of the taster. The description of a wine used by the professionals studied here is then a categorization, not of separate sensory properties, but of wines as an ensemble of sensations. Of courses, as is the case for visual objects, the taster can add a few analytical descriptors to each categorization, particularly when they are very obvious, such as carbonation (CO_2; *sparkling*). Such details cannot be seen in our analysis due to their very small statistical impact in the co-occurrences calculations.

Many studies (Livermore, 1996; Laing, 1989; Bende, 1997) have demonstrated the difficulty even for experts to identify odors in a mixture. It would have been surprising if the wine experts had done better than perfumers. They probably do not, but give some kind of illusion of identifying separate flavors when they identify a type of ''wine flavor.'' However, Livermore (1998) gives results which demonstrate that experts can recognize flavor blends even when they are not able to analyze the content of the flavor. This is in fact probably what wine experts do. Nevertheless, this ability to recognize prototypes is enough for a taster to conduct his or her job. The winemakers will have ''winemaking prototypes'' when the wine critic will have ''quality prototypes.'' This is actually what is observed in the data analyzed here. Corpus P, compiled by a critic, gives *quality* prototypes (*great*, *enjoy*, *amazing*),

whereas Corpus F, compiled by a wine maker, results mainly in *winemaking* prototypes (*oxydized, yeast, woody*).

Nonsensory Properties Are Mixed with Sensory Properties

As can be seen in Corpus H (Fig. 1a), the ''supposed'' sensory description is contaminated by an appreciation that the tasters can obviously not taste. For example, the ''climate'' or the ''château'' make up two separate, non-taste-related groups of word associations. It is well known that many wine critics like to speak of the estate and the vine growing area, and they give the feeling that they can in fact taste it. This indicates that they effectively mix their thoughts, constructed from discussion or observation of wine correlations, with their impressionistic descriptions. This is also the case for critic P, who uses descriptive terms of wine preparation such as ''fining'' or ''filtration.'' This kind of terminology can be considered to come from the tasters' imagination, from an idea they get from the wine, that is to say, idealistic descriptors. This is a specific case of context influence, well described in the literature (Dunker, 1939; Bruner, 1957), where apparently independent data do interfere with sensory judgment. One could interpret this aspect by considering that sensory properties are not easy to describe and depend on the subject so that tasters are attracted by the description of objective data (for instance, that written on the label). This common conformity to the group, well known in social psychology (Sherif, 1935; Moscovici, 1969), is not restricted only to novices, as experts show that they are sensitive to it.

Experts Do Not Ignore Hedonistic Value

As related previously, people who do not know anything about wine specifically or have not had much experience in tasting wine frequently say, ''I would be able to say whether I like it or not.'' Sensory analysts know that hedonistic value is the most active variable in tasting and that if asked whether they like the product before describing it, the description will be modified. Nevertheless, some authors (Richardson, 1989) posit that a subject can never be completely detached from hedonistic value. This is demonstrated in the present article. No taste-related word group is independent of a hedonistic consideration. Many words possess a hedonistic value that is given to a sensory meaning word. For example, ''crisp'' is hedonic positive and is used instead of ''acidic,'' even though the meanings of these words are very similar. Some subjects even organize their language along this dimension (in this analysis, P and F). Others, like G, try to mask their preferences with the terms they use and try to be neutral, but their classes are made of preferences, as can be seen with ratings attributed to wines described with these words (available as ''label words''). One basic consideration used to establish a class, i.e., to form a specific field in a wine descriptive language, is the preference. Novices have two preference categories: the good one and the not so good one. Experts try to describe several categories of each. P evaluates as would a novice, and this could be one reason for the extraordinary success of this writer. It is very surprising that although all authors rated their preferences with numerical text, they needed to use ''rating descriptors.'' This reveals the very strong hedonistic impact in wine and, more generally, flavor descriptive language.

Prototypes Conform to Visual Cues

All of the authors studied use word groups to separate red wines from white wines. In each group, descriptive terms are always connected to the color of the wine: black

wines smell of black currant while old (brown) wines smell of tobacco. This can be seen as the brain's necessity to retrieve a strong correlation to the world it perceives and describes in language. Wine flavor, which is a complex mixture, is then described using words characteristic of objects having the same color. Thus color is the only common categorization among subjects.

Wine Language Is Only Relevant to a Subject

As described previously, the number of classes and their nature are broadly different among subjects. Lawless (1984) demonstrated that experts were not significantly able to recognize wines based on a description given by others, even when they were experts. Given the small number of terms common to the several authors studied here, it seems clear that wine descriptions are deeply individual and that they make sense mainly to the taster him- or herself. The results confirm that a consensual language for the description of wine does not exist and that only ''individual'' languages appear in published works. The analysis of the compiled corpus showed only convergence through color. Category divergence was confirmed by Berglund (1973), who demonstrated with basic odorants that flavor categories do not exist at an interindividual level but that they were accurate for individuals. These differences in language used to describe taste sensations may arise from genetic differences among individuals (Buck, 1993). Olfactory receptors may be encoded by a very large multigene family, so the probability that two individuals will possess the same receptors is very low. This diversity is enhanced by the diversity of learning associated to chemical senses. Individuals do not learn to designate odors in the same way so that a same sensation, a same signal, will be categorized differently, which will lead to different denomination, i.e., different languages. This shows that communication of wine sensory properties is not accurate (Lehrer, 1975).

What Does This Reveal about Brain Function?

We believe that the language organization we investigated in our study relies on cognitive organization of wine flavor. Much specificity of this language structure may arise from known information concerning brain function. First, Rolls (1994) observed in monkeys that there is a convergence of gustatory and olfactory pathways into the orbitofrontal cortex. Moreover, both taste and trigeminal nerves converge to the ventral posterior medial nucleus of the thalamus, so these pathways are mixed early in the treatment of taste and olfactory information. This could explain the inability of wine tasters to separate olfactory and taste description because these data are mixed physiologically at an early perceptive stage.

Studies of flavor perception (Small, 1997) demonstrated that this occurs mainly in the right hemisphere. Incidentally, the right hemisphere is implied in ideogram perception and in dimensional representation more than in analytical processes, which are devoted to left portion of the brain. Thus, the prototypical treatment of olfactory information presented in this paper appears to receive physiological support.

Many authors have discussed the connection of the sense of smell with limbic areas. All chemosensory pathways at an early stage go through hypothalamic structures, implied in pleasure regulation. This does stamp the signal with a preference concern. Basically, animals use the sense of smell to know whether they can eat a food. This is probably what humans do as well. The main cognitive concern regarding flavors is whether they are good or not. This concern is so strong that even experts cannot ignore it and it is what drives the organization of their descriptive language. In this way experts are not so different from novices.

CONCLUSION

This paper describes for the first time the structure of language used by wine experts. Against expected results, this structure is not organized along sensory dimensions, but with prototypes. This means that tasters analyze wine more in terms of ''it looks like such-and-such'' rather than in terms of ''it possesses such-and-such properties.'' This result is coherent with data showing that olfactory cognitive processing takes place in the right hemisphere. Moreover, these prototypes depend on expert preferences. In this way, experts' cognitive processes are not much different from those of novices: they imply hypothalamic pathways. Certainly experts use a much richer vocabulary to describe wine. Each expert is different: he or she possess his or her own discourse strategy that is not shared with colleagues and probably not with the public so that understanding between them is not easy. Teaching of wine tasting implies learning the appropriate descriptive terms for any wine sensory property. This supposes that such an analytical processing of cognitive information is achievable. In the present article we demonstrate that the so-called analytical description is in fact a prototypical one. Furthermore, sensory description always mixes true sensory perception with idealistic data. Because chemosensory information is weak in quantity and reproducibility, much more importance is attached to untastable information, i.e., idealistic data. Perhaps there should be a modification of tasting strategies. This paper also demonstrates that language analysis is very useful in understanding sensory cognitive functions.

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