Universidade do Minho
Escola de Economia e Gestão

Eva Nizon Araújo

The Role of Sensory Marketing in Consumer Decision Making: An Applied Research to the Wine Consumption Experience

November 2023

The Role of Sensory Marketing in Consumer Decision Making: An Applied Research to the Wine Consumption Experience

Eva Nizon Araújo

UMinho |

Universidade do Minho
Escola de Economia e Gestão

Eva Nizon Araújo

The Role of Sensory Marketing in Consumer Decision Making: An Applied Research to the Wine Consumption Experience

Master Dissertation
Master in Marketing and Strategy

Conducted under the supervision of:
Professor Doutor Marco Edgar Sousa Escadas

November 2023

DIREITOS DE AUTOR E CONDIÇÕES DE UTILIZAÇÃO DO TRABALHO POR TERCEIROS

Este é um trabalho académico que pode ser utilizado por terceiros desde que respeitadas as regras e boas práticas internacionalmente aceites, no que concerne aos direitos de autor e direitos conexos.

Assim, o presente trabalho pode ser utilizado nos termos previstos na licença abaixo indicada.

Caso o utilizador necessite de permissão para poder fazer um uso do trabalho em condições não previstas no licenciamento indicado, deverá contactar o autor, através do RepositóriUM da Universidade do Minho.

Licença concedida aos utilizadores deste trabalho



Atribuição
CC BY

https://creativecommons.org/licenses/by/4.0/

ACKNOWLEDGEMENTS

What a great journey this investigation has been. The most powerful life belief that I follow is that everything in life has a purpose. And after all this process, I am surer of that than ever. All the amazing people that crossed my path thanks to this project, those friends and colleagues with whom our connection was strengthened, the new friends that I made these last months, and the professionals with whom I learnt a lot.

To my professor Marco Escadas with whom it was a genuine pleasure to work and I expect to continue my journey in investigation and curiosity for sensory marketing close to his path.

A big thank you to my formator and wine expert, Agostinho Peixoto, for teaching me much more than about oenology. I look forward to crossing his path several times during my professional and personal life. The wine training was enriching at an unpredicted level, not only for the content learnt but for the little 'family' that was built there.

This investigation had the very generous support of the wine producer and exporter Sogrape, which provided the wine used in the experience, and of the D. Diogo de Sousa Museum, which allowed the experience to be conducted in their facilities. I would like to give a special thanks to Ms Sónia Martins, Mr José Cunha and Mr Francisco Xavier for their immeasurable help and kindness. I address a special thank you to all the participants of the experiment led in this investigation, including those who were present in the event but could not participant due to a lack of time.

To Stannah Group – my workplace – for the support of my colleagues and friends during the completion of my master's degree.

Expressly, to Rui, my friends Daniela, Eva and Sara, and my family, for all the unconditional love, support and patience.

Wine had fascinated me as a classy way of socializing, a self-love statement, and a synonym of at once relaxation and status. I had no idea of all that is behind a bottle of wine. I have become an admirer of all the work this art encompasses, and what it represents in national and international commerce. Our wine, our *terroir*, Portugal's role in the wine industry... I am eager to explore this area further.

STATEMENT OF INTEGRITY

I hereby declare having conducted this academic work with integrity. I confirm that I have not used plagiarism or any form of undue use of information or falsification of results along the process leading to its elaboration.

I further declare that I have fully acknowledged the Code of Ethical Conduct of the University of Minho.

The Role of Sensory Marketing in Consumer Decision Making: an Applied Research to the Wine Consumption Experience

Abstract

Wine consumption is a practice with strong cultural origins and substantial economic significance. In an increasingly saturated market, wine producers strive to understand consumer preferences in order to help define a set of elements that can provide differentiating elements from competitors, namely by enhancing the sensory experience of wine consumption. This study aims to explore the impact of the sensory elements of the wine drinking experience on the consumer. Thus, it focuses on the effects of the main sensory inputs of wine - sight, smell and taste. The purpose is to assess how sensory marketing affects consumers' attitudes towards wine. More specifically, to elucidate how consumers' attitudes about the sensory characteristics of wine affect their perception of wine, their intentions, perceived positioning, perceived price and willingness to pay. Using an experimental research design, we devised a four-stage tasting/interaction experiment to study the three main senses related to wine, either from the perspective of each sense alone or from an integrated perspective of the various senses. The results reveal that, in an integrated analysis, taste has a particularly important influence on wine perception and wine positioning. Similarly, vision has a significant impact on wine perception and positioning; Smell has been shown to be a sensory element with special influence on purchase intention. Thus, the production and marketing of wine companies should consider the visual factors of wine as important influencers of consumer attitude.

Keywords: Decision Making, Sensory Input, Sensory Marketing, Wine, Wine Consumption.

O Papel do Marketing Sensorial na Tomada de Decisão do Consumidor: Uma Investigação Aplicada à Experiência de Consumo de Vinho

Resumo

O consumo de vinho é uma prática com fortes origens culturais e um significado económico substancial. Num mercado cada vez mais saturado, os produtores de vinho esforçam-se por compreender as preferências dos consumidores, no sentido de ajudar a definir um conjunto de elementos capazes de proporcionar elementos diferenciadores face aos concorrentes, nomeadamente através da valorização da experiência sensorial do consumo de vinho. Este estudo pretende explorar o impacto dos elementos sensoriais da experiência de consumo de vinho no consumidor. Assim, centra-se nos efeitos dos principais inputs sensoriais do vinho - visão, olfato e paladar. O objetivo é avaliar de que forma o marketing sensorial afeta a atitude dos consumidores em relação ao vinho. Mais especificamente, esclarecer como a atitude dos consumidores sobre as características sensoriais do vinho afetam a sua perceção do vinho, as suas intenções, a perceção do posicionamento, a perceção do preço e a vontade de pagar. A partir de um design de investigação experimental, concebemos uma experiência de prova/interação com quatro fases, a fim de estudar os três principais sentidos relacionados com o vinho, quer numa perspetiva de cada sentido isoladamente, quer numa perspetiva integrada dos vários sentidos. Os resultados revelam que, numa análise integrada, o paladar possui uma influência especialmente importante na perceção do vinho e no posicionamento do vinho. Da mesma forma, a visão possui um impacto significativo na perceção do vinho e no posicionamento; O olfato revelou-se um elemento sensorial com especial influência sobre a intenção de compra. Assim, a produção e o marketing das empresas vinícolas devem considerar os fatores visuais do vinho como importantes influenciadores da atitude dos consumidores.

Palavras-chave: Consumo de Vinho, Input Sensorial, Marketing Sensorial, Tomada de Decisão, Vinho.

Wine is one of the most civilised things in the world and one of the most natural things of the world that has been brought to the greatest perfection.

Ernest Hemingway

INDEX

Acknowledgements v

Statement of Integrity vi

Abstract vii

Resumo viii

Table Index xiv

List of Abbreviations xv

Introduction 16

1. Contextualisation 21

1.1. The Wine from Portugal to the world 21

2. Literature review 23

2.1. Wine – Constitution and (Grape) Wine Making Stages 23

2.2. Constitution of the wine 23

2.3. Wine Making Stages 23

2.4. Sensory Marketing 26

2.4.1. Sensory Marketing applied to Wine Consumption 27

2.5. Wine sensory analysis parameters 28

2.5.1. Visual analysis 28

2.5.2. Olfactory analysis – The aroma and the *bouquet* 30

2.5.3. Taste analysis 32

2.6. Consumer attitude 34

2.6.1. Consumer perception 35

2.6.2. Consumer Intentions 35

2.6.3. Perceived positioning 35

2.6.4. Price Perception 36

2.6.5. Willingness to Pay 36

3. Hypothesis definition and conceptual model 37
3.1. Hypothesis definition 37
3.2. Theoretical framework 37
4. Methodology 38
4.1. Population of the Study 38
4.2. Scales 38
4.2.1. Sight 39
4.2.2. Smell 39
4.2.3. Taste 40
4.2.4. Perception 40
4.2.5. Intention 41
4.2.6. Positioning 41
4.2.7. Price Perception 41
4.2.8. Willingness to Pay 41
4.3. Experimental Procedure 42
4.4. Characterization of the sampling procedures 45
4.5. Data analysis procedures 45
5. Results and Findings 47
5.1. Sample description 47
5.1.1. Gender 47
5.1.2. Age 47
5.1.3. Region 47
5.1.4. Education 48
5.1.5. Marital Status 48
5.1.6. Professional Situation 48
5.1.7. Age of beginning of alcohol and wine consumption 49

5.1.8. Wine preference 49
5.1.9. Alcohol consumption 50
5.1.10. Characterization regarding Wine-related Knowledge 50
5.2. Analysis of the model Constructs 53
5.3. Isolated Sensory Experiences 53
5.4. Integrated Sensory Experience 57
6. Discussion 64
7. Conclusions, and theoretical and practical implications 67
8. Limitations and Recommendations for further work 69
9. Bibliography 70
Annexes 83
Annex A. Technical file of the wine "Framingham Marlborough Pinot Noir 2020". 83
Annex B. Technical file of the wine "Herdade do Peso Trinca Bolotas 2020". 84
Annex C. Questionnaire 1: Observation 85
Annex D. Questionnaire 2: Smell 87
Annex E. Questionnaire 3: Taste 88
Annex F. Questionnaire 4: Integrated experience 90
Annex G. Questionnaire 5: Sociodemographic questionnaire 92
Annex H. Advertising template of the experiment 94

FIGURE INDEX

Figure 1 Wine Aroma Chart 30
Figure 2 Conceptual Model 37
Figure 3 Sogrape, sponsor of the experiment 42
Figure 4 Sensory experience environment 44
Figure 5 Participant answering one of the questionnaires of phase 4 44
Figure 6 D. Diogo de Sousa Museum, sponsor of the event 45
Figure 7 Gender distribution 47
Figure 8 Age distribution of the sample 47
Figure 9 Region distribution 47
Figure 10 Educational qualifications 48
Figure 11 Marital Status distribution 48
Figure 12 Professional situation distribution 48
Figure 13 Age of beginning of alcohol and wine consumption 49
Figure 14 Wine preference 49
Figure 15 Alcohol consumption (times per week) 50
Figure 16 Wine consumption (glasses per week) 50
Figure 17 Characterization regarding sample's Wine-related Knowledge 51
Figure 18 Wine prices awareness 52
Figure 19 WTP for a wine bottle 52
Figure 20 Conceptual Model - Integrated sensory experience 61

TABLE INDEX

Table 2.1 Visual elements of the wine. 28
Table 2.2 Olfactory Analysis of the Wine. 30
Table 2.3 Taste Analysis of the Wine 32
Table 4.1 Characteristics of the two wines 42
Table 5.1 Structural Models – Isolated Sensory Experiences 56
Table 5.2 Structural relationships – Integrated sensory experience 59
Table 5.3 Descriptive Statistics of the items – Integrated Experience 61
Table 5.4 Hypotheses acceptance/Discard 63

List of Abbreviations

AVE – Average Variance Extracted

CR – Composite Reliability

DOC – *Denominazione di Origine Controllata* (Designation of Controlled Origin)

IQR – Interquartile Range

SD – Standard Deviation

SEM – Structural Equation Model

TCA – 2,4,6-trichloroanisole

WBG – Wine by the Glass

WTP – Willingness to Pay

INTRODUCTION

Wine is one of the most popular beverages in the world and also one of the oldest (Goncharuk & Habil, 2017, p. 1; Penn Museum, n.d.). This drink which results from grape alcoholic fermentation, has become a sophisticated choice marker of social class (Hall & Mitchell, 2010, p. 2).

It started as an isolated production mostly locally consumed and especially led by European countries, also known as the Old World, with a production method "characterised by long-established and relatively unchanging methods and locations" (Banks & Overton, 2010, p. 59), after centuries of perfectioning of the techniques of viticulture and winemaking. To the range of factors that lie behind wine quality, from the climatic conditions, soil, geology, topography, aspect, landscape, cultural and historical scopes concerning a wine produced in a certain place, we call *terroir*. The DOC, from the Italian *Denominazione di Origine Controllata*, is one of the regulatory frameworks that protect the range of aspects of the wine industry. However, with the globalisation of wine, there has been a search for lowest production costs, vertical integration, and seek for economies of scale, which led to industrialisation: "certain products become homogenised, developed by careful marketing and supported by production strategies" (Banks & Overton, 2010, p. 58), characterising the New World of wine. There is a dichotomy between these two worlds in the wine industry, but they aren't mutually exclusive. The fact is that these two strategies are still current: "These binary distinctions are all questionable at a finer level of resolution but they do illustrate some important differences within the global industry as a whole" (Banks & Overton, 2010, p. 61). Wine remains one of the markets in the world economy that evolve continuously the most in both "worlds" (Festa, Cuomo, Metallo, & Festa, 2016, p. 1).

The origin of Portuguese wine seems to date back to around 4000 years ago. In fact, there are indications that this product, which in the beginning was produced from vines of the Tagus and Sado, was already the subject of commercial exchanges, representing an important asset in the culture and life of peoples. One of the Old-World countries, today Portugal is one of the most important wine producers worldwide, has more than 250 grape varieties and 14 wine regions and is the country with the most wine consumption per capita (INE, 2023). There are four climatic influences in the country's wine: Atlantic influence from the westside, characterised by moderate temperatures, cool and humid winds and high rainfall; continental influence in the north and east, causing high temperature ranges and low to moderate rainfall; and Mediterranean influence in the south, with dry hot summers and mild winters. The sector continues to demonstrate a huge impact in the country's economy thanks to the increasing wine exportation (Instituto do Vinho e da Vinha, 2022).

Globalisation has a big part of responsibility in wine being such a dynamic sector, as the evolution of the wine is a constant result of the internationalisation of production along with the balance of supply and demand (Tiu Wright, Nancarrow, & Kwok, 2001, p. 355). However, demographic growth, historical events, plagues, consumption level, wine brand hierarchies, annual wine production cycles and climatic conditions have also influence in this process of transformation (Lockshin, Rasmussen, & Cleary, 2000, p. 6; Spawton, 1991, p. 73; Hollebeek, Jaeger, Brodie, & Balemi, 2007, p. 1033).

As a complex product, wine's quality can't be predicted before experiencing consumption. "The consumer, being an intelligent and rational entity with problem-solving capabilities, continually seeks information to aid in the decision-making process. They collect and assess sensory inputs to arrive at well-considered choices" (Markin & Narayana, 1975, as cited in J. R. Issac Balasingh, 2007, p. 10). Regarding wine, it is not an exception – The increase of supply and consequent variety of wines that is available in the world is building a consumer more and more curious and harder to please. The wine consumer is conscious of the wine characteristics and becomes more powerful (Dodd, Laverie, Wilcox, & Duhan, 2005, p. 9; Galati, Crescimanno, Tinervia, & Fagnani, 2017, p. 41; Pucci, Casprini, Nosi, & Zanni, 2019, p. 76). Buyer's decision making process complexity is directly proportional to wine involvement. Consumer involvement represents a self-motivated emotional state that dictates the individual significance of buying a particular product for a specific consumer (Rothschild, 1984, p. 217) and his choice rests on several factors such as the region of origin, grape variety, year of harvesting and brand. A less involved consumer tends to simplify the deliberation, giving importance especially to the price of the bottle when making a purchasing decision (Hollebeek, Jaeger, Brodie, & Balemi, 2007, pp. 1033, 1034; Brata, et al., 2022, p. 4).

The circumstances to drink wine have changed to the same level as the places where it is sold have expanded: wine drinking isn't consumed only at home and supermarkets or restaurants are not the only places where it can be bought. Consumers can have this drinking experience in bars or during wine tourism activities for instance (Maizza & Rosato, 2008, p. 4; Thanh & Kirova, 2018, p. 32). Along with this evolution, society notices another revolutionising modification – the possibility of consuming this alcoholic beverage without buying the bottle but just a glass of it. It is called Wine by the glass (WBG) and it allows consumers to discover new wines reducing the risk perception associated with satisfaction, which is much bigger if there's a need to buy the whole bottle (Jaeger, Danaher, & Brodie, 2010, p. 442). WBG is also an advantage to commercial spaces, as it increases profit (Jacob & Neal, 2011, p. 212). On the other hand, variety seeking can be a weapon against brand loyalty, which can unveil this trend as a challenge for companies in the sector (Yim & Kannan, 1999, pp. 75, 76).

Saturation of the market caused by the number of wineries and wine brands all around the world has been leading to the necessity of standing out. As seen before, Old World countries have been focusing on tradition and quality, but more and more the companies need to know how to sell (Wagner, Olsen, & Thach, 2011, pp. 5, 6). And this is where marketing comes in. Wine marketing is "how you define your wine product, promote it, distribute it and maintain a relationship with your customers" (Wagner, Olsen, & Thach, 2011, p. 6). Wine companies need to better understand consumer preferences and achieve an alignment with them (Hollebeek, Jaeger, Brodie, & Balemi, 2007, p. 1033) in order to "design wine styles that better respond to consumer needs, wants, and expectations" (Lesschaeve, 2007, p. 255).

Studies have shown that appearance, aroma and taste attributes can be related to consumer's expectation (Parr, White, & Heatherbell, 2003, pp. 82, 83), perception (Parr, White, & Heatherbell, 2003, p. 83) and (consequently) preference (Francis & Williamson, 2015, p. 555). For that reason, it is more and more important to produce wines with appealing sensory attributes. Then, it is imperative to make sensory evaluations in order to understand which characteristics are appealing and should be taken into account when producing wine (Francis & Williamson, 2015, p. 554). We refer to the process of interacting with customers through their senses in order to influence their emotions and actions as "sensory marketing" (Erenkol & Merve, 2015, p. 2).

Besides the importance of studying the effect of sensory inputs in consumers, "there has been little application of consumer preference or affective/acceptance testing in wine research or in the wider wine industry" (Francis & Williamson, 2015, p. 555). Previous sensory studies were mainly applied to a trained panel, but the fact is that "expert quality judgement does not necessarily relate to consumer preference or liking" (Francis & Williamson, 2015, p. 555). Also, previous studies mostly focus on factors that influence consumers' behaviour, but aren't able to go further to provide meaning to their achieved results. It would be much more enriching to make conclusions that can be applied to wine making strategies (Smith B. C., 2019, p. 124).

Studies have clearly proved that visual inputs have a huge impact on consumers' taste expectations and perception (Spence, 2020, p. 1; Velasco, Carvalho, Petit, & Nijholt, 2016, p. 1). In the wine industry, very few investigations were led regarding visual input impact on consumers. Indeed, wine quality has been associated mainly to the senses of smell and taste (Shannon B. Rinaldo, 2014, p. 209). Additionally, as regards appearance, there seems to have a focus on colour and a neglect of the wine's other visual parameters – namely, colour intensity, fluidity, brightness and effervescence. Also, regarding colour, studies have compared the impact of colour between white, red and rosé wines, but there does

not seem to be a visual study between wines of the same category (between different white wines, or between different rosé wines, or between different red wines). It doesn't allow us to understand what visual sensory inputs have a great or bad impact on consumers' expectations and perception regarding wines of the same category.

The present investigation aims to address this gap, that is, to comprehend the impact of the visual, smell and taste inputs of wine on consumers' attitude towards red wines. The research methodology used in this study is quantitative. Through an experience with four phases of interaction with two red wines with variances in their sensory inputs (visual, olfactory and taste), we expect to perceive alterations in consumer behaviour that will allow us to make conclusions on the impact of sensory stimuli. The question of the investigation is: "Do sensory elements of the experience have an impact on consumers' decision making regarding wine consumption?"

The purpose of this investigation is to use the findings of this study to possibly guide wine producers on the factors to take into account in the wine production stages, to contribute to the distinctiveness of the final product in a saturated market.

This paper's structure is divided into eight chapters. There is presented the subject of the study and referred its relevance and previous findings, in this introduction. Based on investigation already existent, we found the gap that is expected to be filled by this paper. The investigation question, the objectives and expected contributes are specified.

The chapter one comprehends the overview of the role of Portugal in the wine sector, as a wine producer and a country with a considerable wine consumption.

It follows with the literature review, where there is an explanation of the constitution of wine and the stages of the wine making general procedure. There are presented investigations and findings that had been previously made, as regards sensory marketing and its application to wine consumption. With the overview of wine making and the conclusions that had been previously made in terms of sensory inputs of wine, there is aggregated in three tables, for vision, smell and taste, the way how the characteristics that cause these stimuli can be purposely created. The reader may also find the definition of the main constructs evaluated here. The previous investigations are the base for the formation of research hypotheses and the consequent construction of the conceptual model, in the chapter three.

In the chapter four, there is detailed the methodology of the investigation, with the description of the model of information gathering, the population of the study, the detailing of the experimental

procedure, comprising the characterization of the sampling procedures and the scales used to evaluate the hypotheses.

Chapter five consists in the presentation of the results and findings of this sensory experience, allowing us to build the profile of the sample and accept or discard raised hypotheses.

The end of the paper presents the discussion of the results, the conclusions, theoretical and practical implications of this study, as well as the limitations and recommendations for future work, in chapters six to eight.

1. CONTEXTUALISATION

1.1. THE WINE FROM PORTUGAL TO THE WORLD

Portugal holds the European Wine City of 2023. This award was won by the Douro, which, in addition to being a World Heritage Site, is a European reference in wine and vineyards and produces 22% of all national wine (Lusa, 2023; Instituto do Vinho e da Vinha, 2022).

In fact, Portugal's role in the wine sector is far from mediocre. In addition to being the second leading country in world wine tourism, it was in eleventh place in the list of wine producers in 2021, with a total production of 740 million litres of wine in that year, thus registering a positive evolution of 14.65% compared to 2020. Also in 2021, it rose to eighth position in the list of the main wine exporting countries in the world in terms of volume, with 330 million litres exported that year, equivalent to 927.4 million euros. In 2022, 306.4 million litres of wine were exported from January to November, up 0.5% year-on-year, totalling 875.6 million euros, up 1.9% compared with the first 11 months of the previous year. ViniPortugal sets the goal of reaching the 1-billion-euro barrier by 2023. In the period from January to April 2022, the value obtained from the export of wine (244 562 000€) corresponded to 1.16% of all revenue achieved with exports (24 451 000 000€). (Statista Research Department, 2022; Instituto do Vinho e da Vinha, Exportação / Expedição de Vinhos – Novembro 2022, 2022; Pinto, 2022).

At the top of the list of markets which most import Portuguese wine, according to data for 2021, are France (12%), the United States of America (7.6%) and the United Kingdom (7.21%), followed by Brazil (7.2%) and Canada (3.8%). France is the best import market for Portugal's wines thanks to the weight of Port wine sales, however, it is expected to be overtaken by the second market on the list, as "the USA is a growing market, gigantic and actually encloses several markets in one country" (Pereira, 2022), as says Frederico Falcão, President of ViniPortugal, but also because there is a drop in world Port wine exports of 8.35% (period January to November 2022 compared to the same period in the previous year). There is an increase in sales to countries outside Europe and an attempt is being made to reach more and more of these countries. The European Community no longer imports the majority of Portuguese wine exports: in 2022, the percentage was 45.2%, 0.5 less than in the previous year; non-EU countries show a growing import, receiving 54.8% of exports in 2022, 1.4% more than in 2021. The fact that Portugal is one of the three fastest growing importing countries in the USA and that the American market is growing exponentially makes it the main target for Portugal. The country's focus, in descending order, then goes to Brazil, Canada, Russia and China. (Instituto do Vinho e da Vinha, Exportação / Expedição de Vinhos – Novembro 2022, 2022; Pereira, 2022). The success of Portuguese wine rests on the number of *terroirs*,

the rehabilitation of vineyards, the constant improvement in wine quality, the high know-how, modernisation of transformation units and the improvements that have been made in terms of marketing and management. The market has still room for progression in this sector, as the consumption in non-traditional markets has increased, because of Portugal's role in the tourism sector, the availability of European funds for investment, the formation of wine clusters due to an increased collaboration between education, research and business environment, and also with the growing price per litre ratio (Almeida, 2017, p. 36).

Besides being a major wine producer and exporter, Portugal is also a country of good wine appreciators. Indeed, the Portuguese are the largest wine consumers in the world, presenting an annual wine consumption of 58,2 litters per capita (INE, 2023). In terms of imports, in 2021, Portugal imported 272 million litres, spending 172.9 million euros; in 2022 there was a drop in imports, as there were 258 million litres imported from January to November, 5.3% less in comparison with the same period in the previous year; however, the increase in the price per litre meant that the amount spent on these imports was higher, totalling 178.6 million euros, 14.9% more than from January to November 2021. The main wine exporting markets for Portugal are Spain (95% of the total imported in 2021), Italy (2.9%), Finland (0.9%), France (0.8%) and Germany (0.2%). Of the amount spent on imports from January to April 2022 (33 570 000 000€), 0.17% was allocated to wine imports (58 395 000€) – thus the percentage balance between wine exports and imports was ≈ 0.99%. (Instituto do Vinho e da Vinha, 2022)

2. LITERATURE REVIEW

2.1. WINE – CONSTITUTION AND (GRAPE) WINE MAKING STAGES

"Wine making is an artistic creation in which you deal with a variety of styles, colours, and inspiration therefore good wine, like good art, can evoke emotions, sensations and create an experience which leaves a lasting impression." – Giovanni Morassutti

2.2. CONSTITUTION OF THE WINE

One of the oldest drinks of the world, the wine is obtained from the alcoholic fermentation of fresh grapes, but can also result from other types of fruit, as the only requirements are that the product should have sufficient fermentable sugar, nitrogen source and be suitable for yeast growth. It also contains ethyl alcohol, sugar, acids, higher alcohols, tannins, aldehydes, esters, amino acids, minerals, vitamins, anthocyanins, and flavouring compounds. (Joshi & Kumar, 2011, p. 40)

2.3. WINE MAKING STAGES

Wine making compromises the phases of harvesting and oenology. The grape harvesting normally occurs between August and October, depending on the maturation of the grapes and the climatic conditions of the region; and the oenology, also known as vinification, typically integrates eight stages (Sharma, 2015, pp. 1-3; La Placa, Tsitsigiannis, Camardo Leggieri, & Battilani, 2023, p. 3):

1. Crushing and pressing – This process allows the extraction of the grape juice through pressing. Initially, rotten grapes are removed and, subsequently, pressing is performed, which may be manual or mechanical. However, in some cases the grapes, or at least a percentage, aren't crushed nor pressed, being the whole grapes included in the process of fermentation. This is a method that has been more and more common in the production of red wine. Wine makers have to manage the quantity of stalks left in order to control the bitterness (Darias-Martín, Díaz-González, & Díaz-Romero, 2004, pp. 335, 336; Shoemaker, n.d..; Grainger & Tattersall, 2005, pp. 54, 55).

2. Fermentation – It is the natural process of yeast consuming the grapes natural sugar and converting it into alcohol and carbon dioxide. Usually, it takes approximately a month and has an influence on the degree of sweetness required for each specific wine and its quality in general. It can stop naturally, when the sugar has been all consumed by the yeast, or can also be stopped artificially. During this process, the juice goes down

to the bottom of the vat and the must – which is the juice along with grape skins, seeds and stems – remains at the top of it. To increase fermentation, by boosting the yeast colonies, wine makers choose between two options: *Remontage* – which means to pump over the juice of the must, which has moved to the bottom of the container – or *Pigeage* – that means pushing the grapes down into the juice. The final degree of alcohol expected is between 11% and 14,4% (Frost, Harbertson, & Heymanna, 2017, p. 2; Cocolin & Ercolini, 2008, p. 165; Di Stefano, Bosso, Panero, & Follis, 2003, p. 1; Grainger & Tattersall, 2005, pp. 57, 58).

3. Maceration – After completion of the alcoholic fermentation, the must will start the process of maceration, that consists in the extraction of colour, flavour and tannins. Studies show that the tannin concentration has an impact in the sensory perception, altering the intensity of sweet, sour, drying and astringent texture. The duration of the maceration plays a big role in the colour of the wine: the more the skin contact, the darker is the colour of wine; that said, white wines have shorter macerations than rosé wines, and in rosé wines this process is shorter than for red wines. Taking between 2 and 28 days (Frost, Harbertson, & Heymanna, 2017, p. 2; Kennedy, Ferrier, Harbertson, & Gachons, 2006, p. 1; Guerrini, et al., 2022, p. 2).

4. Clarification – It consists in the removal of the sediments in the wine through the separation of the clear wine and sediments before being transferred to containers (Mierczynska-Vasilev & Smith, 2015, p. 2).

5. Malolactic fermentation – Once in the containers, the wine suffers the stage of malolactic fermentation, which is the process of transforming the tart malic acid into lactic acid, that provides the wine a smoother texture (Grainger & Tattersall, 2005, p. 60).

6. Blending – After maturation, the wine is transferred to a stainless-steel vat where the wine from different vineyard plots is put together. “Blending of these various vats will then take place in order to achieve the desired final style and quality of wine”, as it is expected to create a product that is better than each of its parts. Thus, the wine may be turbid, that’s why it will pass through a fining process again to remove unwanted particles (Grainger & Tattersall, 2005, p. 60).

7. Maturation – The wine is left in a container for 6 to 24 months, which is called maturation, or *Élevage*. The container can be of wood, stainless steel or of other materials and sizes, and it has an impact on the taste of the wine. In addition, in the case of oat vats, the porosity of the wood influences the oxygenation, which may affect the softness of the product. Also, the wine will absorb some oak elements, such as tannins and vanillin. The oxygenation and temperature are also factors that have an impact on maturation. During maturation, the wine is clarified several times before being transferred to bottles (La Placa, Tsitsigiannis, Camardo Leggieri, & Battilani, 2023, p. 5; Per & Karlsson, 2019).

8. Bottling – Before bottling, a certain number of precautions has to be taken to ensure the wine's stability, including pasteurisation or sterilisation. Traditionally, the bottle of wine is closed with cork (Grainger & Tattersall, 2005, pp. 71, 72).

Thus, all these stages of wine production are determinants that influence the characteristics of the wine and its intrinsic quality, that is, there are factors of quality regarding the grape, and factors of quality regarding the process (Linda F. Bisson, 2002, p. 696). Four criteria can be used to describe quality: value; excellence or superiority; specification compliance; and meeting or surpassing customer expectations (Reeves & Bednar, 1994, pp. 29, 30).

In the wine industry, quality of wine can be subjectively expressed by the judgement of experts, that will base themselves in the objective factors of quality regarding grape and quality regarding the process to evaluate visual, olfactory and taste attributes. It will be assessed the presence of defects and aspects such as charm, pleasure, complexity, originality and purity. On the other hand, consumers will engender another quality evaluation of the product, as they do not possess the knowledge of experts but are the main target and judge the wine based on numerous factors (Jover, Montes, & Fuentes, 2004, p. 454). As Charters and Pettigrey (2005, p. 134) characterize, wine quality is hard to put in concrete because it is subjective and a "quasi-aesthetic object". For that reason, marketing academics have focused on the concept of perceived quality rather that quality (Oude Ophuis & van Trijp, 1995, p. 177; Rust, Inman, Jia, & Zahorik, 1999, p. 78, 79). For Steenkamp's (1990, p. 312), perceived quality tries to function as an intermediary between objective product qualities and consumer preferences.

Beyond the measurable aspects of quality, drinking wine is a multimodal experience that involves the visual, olfactory, and taste elements (Hughson, Ashman, De La Huerga, & Moskowitz, 2007, p. 103). Wine quality interacts with human emotions and preferences (Danner, et al., 2016, p. 254), as previously

pointed out, making it an appealing subject for marketers to research. Due to the experiential nature of wine consumption, it is essential to recognize and comprehend the role that sensory inputs play in the wine-consumption experience in order to analyse how they affect customer decision making and elaborate sensory marketing strategies (Lesschaeve I., 2007, p. 257). In recent years several contributions have emerged in order to create, develop and increasingly value the wine consumption experience itself and the respective sensory evaluation that the consumption of this product favours and stimulates (Sáenz-Navajas, et al., 2014, p. 401; Bruwer, Saliba, & Miller, 2011, p. 8).

2.4. Sensory Marketing

The way our brains take in the information around us is through our sensory systems. Through the study of neuroscience, it is possible to comprehend how our brains encode and interpret this information and how it affects our emotions and consumption habits (Rodrigues, 2015, p. 69). Through our five senses, we are able to gather information from our environment, which is then processed by receptor cells and sent to particular parts of the brain to produce sensory inputs. Our sensory systems affect our memories, emotions, and decisions in this way, influencing our consuming attitudes and behaviours. (Rodrigues, 2015, P. 69).

In order to communicate with the consumers in a seducing and influencing way, companies can produce stimulants that are received by sense organs (Erenkol & Merve, 2015, p. 2). Through sight, taste, smell, touch and hearing, the senses are behind the creation of expectations for that product/service and allow the perception of quality (Lintelle, 2014, p. 264). However, if the perception does not meet or surpass the expectations, there's an unalignment of the sensory inputs and it will generate dissatisfaction (Nadanyiova, Kliestikova, & Kolencik, 2018, p. 103). Thus, sensory marketing has an impact on the perceived quality. This perception is then stored in memory and resurfaces when the person is confronted with the same product or service again (Petit, Velasco, Cheok, & Spence, 2015, pp. 1, 3).

When the exposure to a stimulus influences the response to another stimulus, there's the effect of implicit memory called Priming (Lintelle, 2014, pp. 264, 265). According to Lintelle (2014, pp. 264, 265), there are two types of Priming, the direct and indirect. While the direct consists in "the exposure to a stimulus that facilitates its later retrieval", the indirect "is one where the prime and the target are not directly related but through certain associations". The same author reveals that memory, that can be used to understand Priming, can be explicit or implicit – while the explicit memory is cognitive and is able to acquire knowledge and recall past events, the implicit part refers to a non-conscious influence on behaviour.

Perception dictates whether the consumer is satisfied or not. Thus, satisfaction relies on the multisensory attributes inherent in both products and services (Achrol & Kotler, 2012, p. 37), as people extract meaning from the totality of a group of stimuli and not from each stimulus individually, that said, stimuli associations can have an impact on each other. For instance, taste expectation and taste perception can be based on visual or auditory dimension (Petit, Cheok, Spence, Velasco, & Karunanayaka, 2015, pp. 1, 3). Additionally, the consumer experiences a product or brand more vividly and with deeper emotions if it appeals to multiple senses simultaneously (Nadanyiova, Kliestikova, & Kolencik, 2018, p. 99).

A brand must be distinctive in order to stand out from the competition and win over its customers' loyalty, and that is through the sensory inputs that shape the brand and image (Nadanyiova, Kliestikova, & Kolencik, 2018, p. 96).

Lately, sensory marketing has been applied to various sectors but specially in the saturated market of restauration. The use of sensory marketing has been applied to create a pleasant and distinctive environment. Examples of restauration chains that have employed sensory marketing strategies around the world are KFC, Dominos and Subway (Hussain, 2018, p. 33).

2.4.1. Sensory Marketing applied to Wine Consumption

Drinking wine "engages more of our brain than any other human behaviour", as quoted in Hoyle (2017). According to Lehrer & Lehrer (2016, p. 755), the sensory analysis of wine englobes nine main characteristics, which are the visual aspect, sweetness, acidity, astringency, age, body, aroma, harmony and complexity. However, as suggested by Spence (2020, p. 2) the perception of wine is influenced by much more factors, such as the weight of the wine bottle, the sound made by its closure, the glass from which it is drunk, the wine's visual appearance and the multisensory environment where it is consumed. As said earlier, each of these attributes consist in sensory inputs that have influence on each other and have impact on the consumer's behaviour.

However, it's the visual and olfactory characteristics that dictate the expectation (Velasco, Carvalho, Petit, & Nijholt, 2016, p. 1). Vision is the sense in which consumers rely the most, as it identifies the product and makes predictions about its characteristics. The expectations are, then, generated before tasting and have an impact on the viewer's attitude towards the product (Spence, Motoki, & Petit, 2022, p. 3).

2.5. WINE SENSORY ANALYSIS PARAMETERS

Also called Wine Psychology, the wine sensory analysis focuses on the cognitive and perceptual factors influencing the wine drinking experience (Spence, 2020, p. 2). We are going to analyse each main sensory input present in the wine, the drink categorization regarding each characteristic, as well as the aspects that cause them.

2.5.1. VISUAL ANALYSIS

The wine presents five main visual sensory inputs that can have an impact on the consumer's expectations towards the product: clarity, colour, colour intensity, fluidity and effervescence.

Table 2.1 Visual elements of the wine.

Visual elements	Categorization	Aspects influencing the characteristic
Clarity	Crystalline pure; with lightning; sparkling; clean with a weak veil (hazy); dull; opalescent; cloudy or very cloudy.	– Grape variety – Age of the wine – As wine ages, it can lose its clarity. – Filtering – The absence of filtering makes the wine opaque.
Colour	White: Pale straw, medium straw, deep straw, pale yellow, medium yellow, deep yellow, pale gold, medium gold, deep gold, Pale brown, medium brown, deep brown, pale amber, medium amber, deep amber. Rosé: Pale cooper, medium cooper, deep cooper, pale salmon, medium salmon, deep salmon, pale pink, medium pink, deep pink. Red: Pale ruby, medium ruby, deep ruby, pale purple, medium purple, deep purple, pale garnet, medium garnet, deep garnet, pale tawny, medium tawny, deep tawny.	– Grape variety – the pigmentation of the grape influences the colour. – Quality – Colour pigmentation tends to low quickly on commercial wines than on wines that are designated to age.
Colour intensity	Pale, medium, deep	– Age – for red wines, the clearer the colour, the older is the wine; for white wines, that's the opposite – the darker the wine, the older it is. – Acidity – The more acidity there is (lower pH), the more intense the colour of the wine is. – Grape variety – the pigmentation of the grape influences the colour intensity. Also, thicker-skinned red grapes tend to produce wines with a deeper colour. – Soil – A soil richer in calcium produces grapes with thicker skins, which tends to induce to a darker wine. – Climate – Hot climates or years induce to a quicker grape development, resulting in thinner skins and consequently lighter wines. – Harvesting time – the earlier harvesting occurs and lower is the colour intensity. – Pressing force – wine producers can perform more or less heavy pressing to accentuate or reduce colour. – Stem presence – Wines where stem wasn't taken off have a lower colour density.

		– Level of tannins – colour intensity can be deepened by the presence of tannins. – Maceration process – the duration is directly proportional to the intensity of the colour. – Charcoal filtration – can occur to remove colour, occurring specially in white wines. – Temperature of fermentation – the higher is the temperature, the lower is the colour intensity. – Presence of sulphur – higher sulphur addition causes lower intensity.
Fluidity	Viscous, fat, unctuous, fluid, very fluid, thin	– Sugar – the more sugar it has, the less fluid is the wine. – Protein – Fluidity is also inversely proportional to the number of proteins. – Alcohol – More alcohol tends to induce to a less fluid wine.
Effervescence	Still, pearl, sparkling	– Fault – refermentation or malolactic fermentation in the bottle can cause bubbles. – Dissolved carbon dioxide retention can cause bubbles.

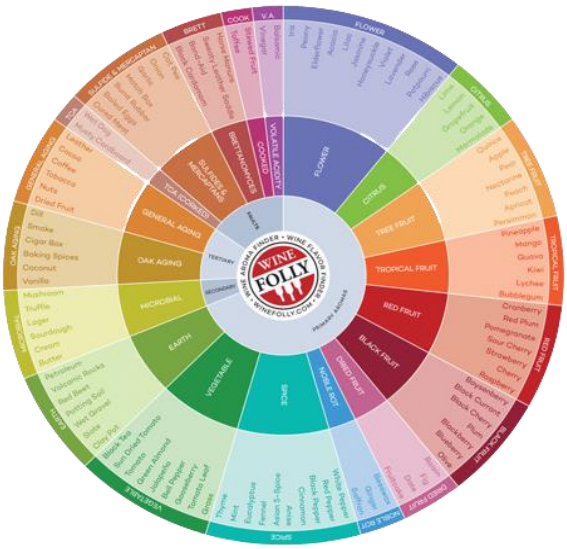
(Source: The Wine Colour Chart, n.d..; Afonso J., 2013, as cited in Rupio, pp. 45-47; Puckette, n.d..; Schuster, 2002, pp. 8-12; Smith, 2017, pp. 5, 6, 33; Russan, 2019; Correia, 2013, as cited in Rupio, 2017, pp. 45-47)

Wine clarity refers to the amount of suspended particulate matter and can indicate whether the wine has quality or not. Also, hazer appearance can signify that the drink is spoiled; on the contrary, a brilliant and clear wine is a predictor of a healthy wine (Wine Spectator, n.d..). From the visual inputs of the wine, especially the colour influences "people's flavour expectation, categorisation, search, and perception" (Casales-Garcia, Gonzalez-Abril, Veflen, & Velasco, 2023, p. 1). It is one of the most important attributes influencing the consumer's wine choice and the first sensory aspect when evaluating its quality, being closely related to flavour, taste and texture perception (Birse, 2007, pp. 33, 34). The colour is used in order to convey the flavour and even to intensify the flavour perception (Casales-Garcia, Gonzalez-Abril, Veflen, & Velasco, 2023, p. 1; Afonso, 2016, p. 8). In a study developed by Morrot, Brochet and Dubourdieu (2001, pp. 4-10) expert tasters were asked to smell white wine, dyed red with food colouring, and to describe it. The provided description highlighted features of red wine instead of white wine. This leads us to infer that, in situations of uncertainty, visual information takes precedence over olfactory cues as a sensory indicator of a stimulus's properties (Morrot, Brochet, & Dubourdieu, 2001). Colour intensity consists in the concentration of colour and, to be analysed, the assessor must tilt the cup at a 45º angle toward a light source, verify the presence of a ring on the edge of the cup and compare it to the eye, in the centre of the liquid (Rupio, 2017, p. 46). Wine fluidity can be observed by the presence of tears in the glass. Although it is related to the amount of sugar and alcohol, a bigger tear can also mean that the glass temperature is warmer, as the alcohol evaporates faster (Goode, 2012). Effervescence can be found in wines other than sparkling wine (like Champagne) and can transmit a sensation of freshness and texture (Wine & Spirit Education Trust, 2018), it is common in wines from the region of the Vinhos Verdes, a region in the northwest Portugal and "one of the largest and oldest wine regions in the world", with a unique *terroir* and Atlantic influence; the wine is fresh and light (Vinho Verde, s.d.).

2.5.2. OLFACTORY ANALYSIS – THE AROMA AND THE *BOUQUET*

Wine presents three olfactory sensory inputs present in the aroma and the *bouquet*. While the aroma is a result of the grape types, harvesting technology applied, fermentation conditions, characteristics of the ageing and the method of conservation and storage (Rapp, 1986, pp. 873) but associated to a young wine and so being characterised by primary aromas; the *bouquet* is a French world designating the set of aromas present in the wine resulting from the evolution of compounds – the secondary and tertiary aromas (Rapp, 1986, pp. 878).

Figure 1 Wine Aroma Chart



(Source: https://winefolly.com/tips/wine-aroma-wheel-100-flavor/)

Table 2.2 Olfactory Analysis of the Wine.

Olfactory elements of the wine	Categorization	Influencing aspects
Condition	Clear, unclear	– Trellising system – Will affect sun exposure. Excessive wine exposure can increase the risk of disease and ripening issues. – Harvesting – Choosing when to pick is fundamental to avoid the risk of picking rotten grapes. – Triage – It is again primordial to select the grapes and avoid producing wine with rotten grapes that can lead to a faulty wine. – Pressing – If the wrong phenolics are left, the wine can oxidate later on. – Sulphur dioxide addition – prevents unwanted microbial presence and avoids oxidation, and consequently the production of faulty wines. – Yeast – if the wrong yeast ferments, off-flavours can develop. – Ferments – If they stick, wines can be unstable. – Sugar – If not all sugar is consumed, it increases the risk of Brettanomyces (Brett) and spoils the wine. – Wine ageing and storage – Risk of Brettanomyces (Brett) development, oxidation reduction. Cork bottle closure can be the cause of the TCA bacteria, that is a flaw. – Bottling – A wrong process can cause excessive oxygenation and have an impact on how it develops.
Intensity	Light, medium (-), medium, medium (+), pronounced	– Grape type – Year of harvesting – Wine age – Wine making processes – Presence of TCA – reduces wine olfaction – Presence of Brett – reduces wine olfaction

Complexity	Poor, simple, fairly complex, complex, very complex	– Combination of primary, secondary and tertiary aromas – the more aromas it has and the more complex the wine is.
Aroma characteristics	See Figure 1	**Primary** – aroma obtained from grape and alcoholic fermentation. – Primary fermentation temperature – Too high temperature can lose fruitiness. – Yeast – if the wrong yeast ferments, off-flavours can develop.
		Secondary – aroma obtained from post-fermentation winemaking.
		Tertiary – flavours obtained from maturation.

(Source: Wine & Spirit Education Trust, 2018; Goode, 2018, pp. 18, 42, 122)

Wine can present quality issues that make it faulty, or unclear, and as seen before, there are particularities in the grapes or in the production processes that can induce this loss of quality. However, a wine can be faulty and still be pleasant to the consumer. A well common fault is the presence of 2,4,6-trichloroanisole (TCA) in wine – a bacteria that contaminates the cork stopper and can also contaminate the wine specially if the bottle is stored in the lying position. It can cause a dissimulation of the wine olfaction as it reduces odours intensity (Sullivan, 2020). Another frequent problem is Brettanomyces, commonly known as Brett, which is a yeast associated specially to red wines. The first sensory effect caused by Brett is the "reduced varietal character, followed by the degradation of certain fruity aromas by esterases present in this yeast" (Goode, 2012, p. 22). Firstly, there can be hints of smoke and spice, then the smell and taste become medicinal, it will accentuate acidity and tannins, and then the wine will begin to smell of horses or animal sheds, for instance. The consumer may also fell a metallic sensation on the back palate. It is also a fault that can sometimes not be one, depending on the level, context and preference of the drinker. It can induce to interesting flavours and the fact is that the practices used to minimize it can also reduce the wine's quality – for instance, avoiding oak barrels. White wines are less at risk because of the lower pH and lower level of suitable substrates (Goode, 2012, p. 20). A wine is complex when it stimulates all taste buds inside the mouth and can be defined as round or broad (Posteraro, 2021), yet, a complex wine isn't forcibly a high-quality wine. Wine aromas can be characterised by clusters that agglomerate more specific descriptors and these clusters are: floral, green fruit, citrus fruit, stone fruit, tropical fruit, red fruit, black fruit, dried fruit, herbaceous, herbal, pungent spice, for primary aromas. Secondary aromas can be described with the following clusters: Yeast, malolactic fermentation and oak. And tertiary aromas can be characterised using the terms: deliberated oxidation, fruit development and bottle age. In a wine assessment, the examiner can use more than one cluster to describe the wine and also use others than the ones mentioned.

2.5.3. TASTE ANALYSIS

Wine taste is mainly constituted by the elements of sweetness, acidity, level of tannin, level of alcohol, body, flavour intensity and characterisation of the aroma. The characterisation of the aroma uses the same descriptors as in wine olfactory analysis, which are related to primary, secondary and tertiary aromas/flavours and they are also related to grapes and alcoholic fermentation, post-fermentation winemaking, and maturation, respectively.

Table 2.3 Taste Analysis of the Wine.

Taste elements of the wine	Categorization	Influencing aspects
Sweetness	Dry, off-dry, medium-dry, medium sweet, sweet, luscious	– Trellising system – Will affect sun exposure. Excessive wine exposure can lead to very high sugar levels. – Harvesting – the sooner it is done and the more sugar it has. – Maceration – Overextraction can cause inappropriate bitterness.
Acidity	Low, medium (-), medium, medium (+), high	– Harvesting – the sooner it is done and the more acid it is. – Brett presence – It will accentuate acidity
Tannin	Level – Low, medium (-), medium, medium (+), high Nature – ripe/soft, unripe/green/stalky, coarse, fine-grained	– Grape type – Maceration – the level of tannins tends to be proportional to maceration time. – Maturation with oak – it will induce to an increase of the tannins level. – Charcoal filtration – can occur to remove tannins, occurring specially in white wines.
Alcohol	Low, medium (-), medium, medium (+), high	– Trellising system – Will affect sun exposure. Excessive wine exposure can lead to alcoholic wines. – Harvesting – the sooner it is done and the less alcohol it has.
Body	Low, medium (-), medium, medium (+), full	– Sugar – The more sugar it has, and the fuller is the body. – Grape extract – The more extract it has, and the fuller is the body. – Acidity – The more acidity it has, and the less full is the body. – Tannins – The more tannins it has, and the fuller is the body. However, the more astringent tannin (astringency) it has and the lighter is the wine. – Flavours intensity – The more flavour intensity it has, and the fuller is the body.
Flavour intensity	Low, medium (-), medium, medium (+), pronounced	– Harvesting – the sooner it is done and the less intense is the flavour. – Treatment for the enzyme glucose oxidase – wines with this treatment can have a lower flavour intensity. – Alcohol – More alcohol induces to more flavour intensity. – Physical removal of ethanol – If this process occurs, it will reduce the wine flavour intensity. – Temperature – when tasting wine, if the temperature is too low the flavour intensity will be lower.
Characterization of the flavour	See Figure 1	**Primary** – flavours obtained from grape and alcoholic fermentation. – Primary fermentation temperature – Too high temperature can lose fruitiness.

		– Yeast – if the wrong yeast makes fermentation, off-flavours can develop.
		Secondary – flavours obtained from post-fermentation winemaking.
		Tertiary – flavours obtained from maturation.
Astringency	Low, medium (-), medium, medium (+), high	– Acidity – Is associated with altering astringency. – Alcohol – Has been shown to decrease astringency. – Tannins – Astringency is modified by tannin chemical structure. – Maceration – Overextraction can cause inappropriate astringency.
Texture	Steely, oily, creamy, mouthcoating	– Alcohol – The more alcohol the wine presents and the more viscous is the wine. – Sugar – Wines with more sugar tend to be less fluid. – Malolactic fermentation – the wine is creamier with this process. – Effervescence – Bubbles give texture to the wine. – Tannins – A wine with more tannins has more texture. – Acidity – A less acid wine should be creamier.

(Source: Wine & Spirit Education Trust, 2018; Goode, 2018, p. 17; Per & Karlsson, 2019; Frost, Harbertson, & Heymanna, 2017, pp. 1, 2; Cavanova, 2019; Fischer, Boulton, & Noble, 1994, p. 9; Fontoin, Saucier, Teissedre, & Glories, 2008, pp. 286-287; Gawel, Van Sluyter, Smith, & Waters, 2013, p. 425; Vidal, et al., 2003, pp. 564, 565).

Sweetness is the taste of sugar and its perception can be accentuated through alcohol and glycerol. While a dry wine is a product that does not present residual sugar or does but in very low level undetectable on the palate, a luscious wine is so sweet that the texture is more viscous and there remains a sticky sensation in the mouth and lips. Acidity can be felt when the mouth starts watering when tasting. The more it waters and longer and the more acid is the wine. Acidity is not inversely proportional to sweetness, however, if a wine is sweet, acidity will be less notable than if the wine is dry (Wine & Spirit Education Trust, 2018). Some wines are naturally more acid, which is the case of the wines of the region of the Vinho Verde. Tannins are mainly common in red wines and induce to a bitter taste especially on the front side of the mouth (Angela, 2017). In terms of nature, a wine can be unripe or green if it leaves a bitter taste in an unpleasant level, on the contrary, a ripe or fine-grained wine is velvety and presents no trace of bitterness (Wearing, 2019). The body of the wine is the perception of the drink's weigh on the palate. And even if it an overall impression caused by all structural elements, alcohol is the main one. Flavour intensity is the impression of tastiness of the wine on the palate but it is detected through the sense of smell: "Once the wine is in your mouth, your body heat raises the wine's temperature and causes aromatic molecules to rise up the back of your nose to the receptor that handles your sense of smell", for that reason, we call a nasal tasting when we smell the wine and a retro nasal tasting when we taste it (Wearing, 2019). Intensity is directly linked to the finish/aftertaste, which is the persistence of the flavour after drinking the wine (Wine & Spirit Education Trust, 2018). As said earlier, the characterization of the flavour is similar to the aroma's description.

Although being sensory inputs felt in the mouth, there are important aspects in wine that should be linked to tactile characteristics, that are alcohol, astringency and texture. In fact, alcohol is detected mainly through touch as the wine can be more viscous and then heavier in the mouth if it has higher alcohol levels. It can also induce mouth-watering. It is low on alcohol if it has below 11% of alcohol, medium (-) if it has between 11% and 11.9%, medium (+) if among 12% and 12.9% and high if it has a level of alcohol at 14% or above (Wine & Spirit Education Trust, 2018). Astringency is a primary mouth-feel more current in red wines and linked to the level of tannin, being "commonly described as 'drying', 'roughing' and 'puckering'" (Gawel, 1998, p. 74). Texture is related to wine's body and can be defined as the mouthfeel resulting from an overall sensation interlinking viscosity, acidity and astringency (Wine & Spirit Education Trust, 2018).

There are other factors that can have an impact in each sensory input of the wine and dictate whether it has quality or not. The soil itself has a major effect on wine properties: its structure, depth, aeration, nutrient status, colour, fertility and level of nitrogen will influence the quality of the final product (Gilby, 2020). Also, the process of vineyard planting is a complex procedure that can lead to a loss of quality if the grape variety or the rootstock are not proper. Irrigation is also a process that can have an impact in wine quality if there is too much or not enough water. Spaying regimes and cultivation are practices that prevent diseases but can also damage the microbial ecology and reduce wine quality (Goode, 2018).

Overall, wine produces expect to create a harmonious wine. That is, a wine balanced where all components work together in a seamless way. Quality is measured with a 5-points scale: poor, acceptable, good, very good and excellent (Wine & Spirit Education Trust, 2018).

2.6. CONSUMER ATTITUDE

Attitudes consist in a natural predisposition to engage a specific task (Myers, 1993, pp. 123, 124). It is a mental state, relatively permanent and stable that guide thoughts regarding an object or a person and can influence and predict behaviours (Myers, 1993, p. 125). Thus, it is important to marketing research to understand this concept and how it is formed as it can have an impact on consumers' interests and propensities to involve in particular behaviour (Kraus, 1995, p. 59; Argyriou & Melewar, 2011, p. 431).

2.6.1. CONSUMER PERCEPTION

Consumers interact with a product and determine whether it has quality or not through different variables that are interpreted individually by each person differently. These variables are based on factors such as flavour, smell, size, place of origin, distribution channel, price and packaging (Kotler P., Armstrong, Harris, & He, 2020, pp. 154, 238). However, as suggested by Kotler (2001, as cited in Agyekum, Haifeng, & Agyeiwaa, 2015, p. 25), in a situation where there is a lack of information to draw conclusions about the quality of a product, it is the price factor that prevails and dictates the consumer's perception. That said, "perception is the process, by which an individual select, organizes and interpret information inputs to create meaningful picture of the world" (Agyekum, Haifeng, & Agyeiwaa, 2015, p. 25). This interpretation of information is selective, as not all details catch the attention of the consumer, which is called selective perception, and it's the consumer's attitudes and beliefs that predict what are the more important cues and which details are inconsistent and so ignorable. This interpretation will have an impact in consumer's behaviour. In that sense, it is important to have this into consideration when developing the marketing mix of a product (Kotler, 2000, as cited in Pholvisrethkul, 2002, p. 17).

2.6.2. CONSUMER INTENTIONS

According to the American Psychological Association Dictionary of Psychology, intention can be defined as "a prior conscious decision to perform a behaviour" (Intention, 2023). Indeed, some researchers such as Ajzen and Fishbein (1980, p. 301) defend that the only way how attitudes have an effect on behaviour is through their impact on intentions. On the contrary, others are convinced that attitudes can directly influence behaviours without the intermediary of intentions. Bagozzi, Baumgartner and Youjae YI follow the first philosophy, explaining that it is possible to have a "positive attitude toward performing some act but fail to form an intention or intend to refrain from doing the action because of some nonattitudinal reason. Including a direct path from attitude to behaviour does not allow for such possibilities" (1989, p. 36).

2.6.3. PERCEIVED POSITIONING

Positioning can be defined as the way of differentiating a product among the competing products, by embedding in the target's minds a desired image of the product. It should serve as a guide in the marketing strategy as it should result in the communication of a value proposition (Kotler & Keller, 2016, p. 457).

2.6.4. Price Perception

According to Kalyanaram and Winer (1995, p. 162), the consumers possess an internal reference price for a product, which is estimated to be the most recent price paid for this type of product. While interacting with the product, it will occur sensory judgements. The assemblage of the past and present stimuli will create the construct of internal reference price, an adaptation level relative to which new stimuli are perceived and compared. This internal reference price will conflict with the concrete market price. In that logic, the consumer will find the market price relatively expensive if it is higher than expected, and relatively inexpensive if it is lower (Kalyanaram & Winer, 1995, p. 162; Thaler, 1985, p. 204).

2.6.5. Willingness to Pay

Willingness to Pay (WTP) is the construct that indicates how much the consumer's is predisposed to pay for a product or service. It can be divided in two distinctive concepts, the maximum price, and the reservation price. The maximum price can be calculated by the sum of the reference price and the differentiation value between a reference product and the offered product, that can be positive or negative (Nagle and Holden 2002, p. 49). The reservation price, though, is the highest price that the person is willing to pay and to which he/she purchases the good.

WTP reflects consumer's preferences and is linked to purchase intentions and behaviour. Also, a food related paper has previously constated that sensory attributes have a decisive influence on consumers' WTP (Hung & Verbeke, 2018, p. 29).

3. HYPOTHESIS DEFINITION AND CONCEPTUAL MODEL

Based on the presented literature review and the objective of this study, research hypotheses were established, which will be either accepted or rejected, and the conceptual model was designed.

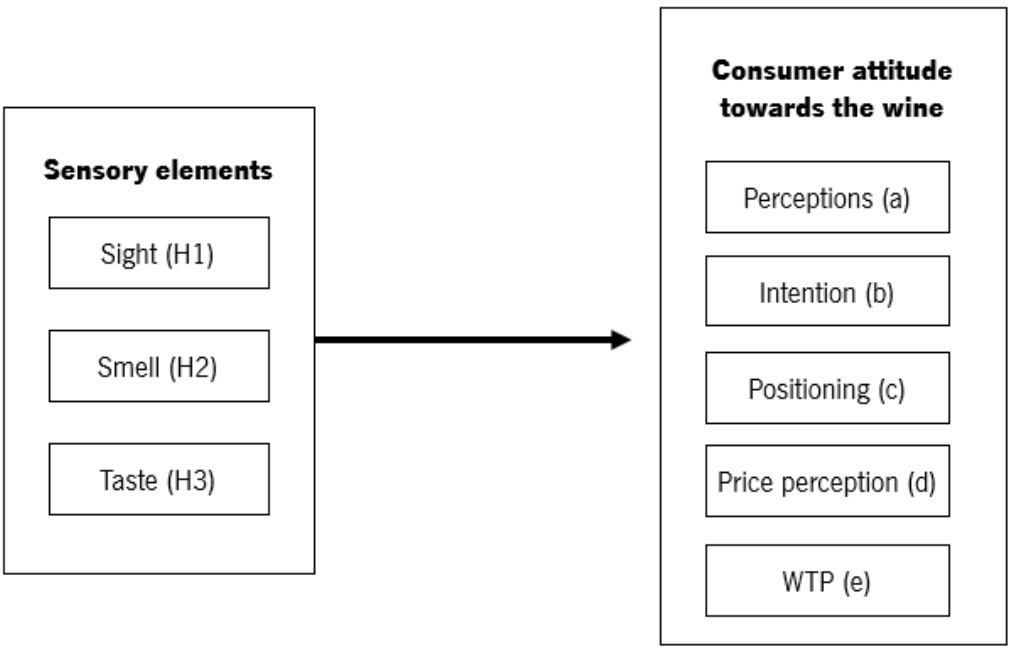
3.1. HYPOTHESIS DEFINITION

This study aims to understand the impact of wine sensory inputs on consumer's attitude, more specifically on perception, intentions, positioning, price perception and willingness to pay. In this sense, we raised the following investigation hypothesis: Sensory perception of wine (i.e., sight - H1; smell - H2; taste - H3) positively influences consumer attitude towards wine, specifically perception (a); intentions (b); positioning (c), price perception (d); and willingness to pay (e).

3.2. THEORETICAL FRAMEWORK

The conceptual model presented in Figure 2 is a visual representation of the hypothesized relationship among variables. This model provides a theoretical framework for understanding how sensory stimuli present on wine can have an impact in consumer's attitude.

Figure 2 Conceptual Model



(Source: Researchers' own elaboration)

4. METHODOLOGY

The objective of this investigation is to solve the research question: "Do sensory elements of the experience have an impact on consumers' decision making regarding wine consumption?". With this purpose surges the need of designing a research methodology, defining the data that we expect to collect, the methods that are going to be adopted and how we are going to analyse this data, having also into consideration the resources available to develop the procedure (Kothari, 2004, pp. 10-19).

We designed a research methodology that would let us distinguish each main visual input of the wine, that were set based on literature review, and study if they individually affect the consumer's expectations and perception in regard of the wine.

According to the purpose mentioned above, we developed a conclusive and causal research design, which allows to test specific hypotheses and examine cause-effect relationships among variables by the mean of experiments. The outcome is expected to be used as an input into decision making in the wine sector (Malhotra, 2017, p. 304).

4.1. POPULATION OF THE STUDY

The population of interest in the research are everyone interested in participating in the experiment, whether appreciating wine or not and independently of their wine consumption habits. The only requirement is that they must be 18 years old or older and be willing to go to the place where the experiment would take place and conclude the experimental procedure.

4.2. SCALES

Expecting to test the hypotheses that were previously suggested, a questionnaire devised into five phases was created and handed out during the sensory experiment, as indicated in the previous subchapter. A questionnaire comprises a structured series of inquiries designed to gather information from respondents, ensuring uniformity and comparability of data among interviewers (Malhotra, 2017, p. 374; Grover & Vriens, 2006, p. 83).

This questionnaire is a result of a set of closed-response questions used in order to evaluate the following constructs: Sight, Smell, Taste, Perception, Intentions, Positioning, Price perception and Willingness to Pay. The first questionnaire focusses on the sense of sight, the second on the sense of smell, the third on the sense of taste, the fourth on the integrated experience with all three senses and the fifth consists in a sociodemographic set of questions. As regards the scales to evaluate sight, smell

and taste, they have all been elaborated by ourselves having as a base the WSET wine assessment guideline (Wine & Spirit Education Trust, 2018).

4.2.1. SIGHT

Scale		Item	Measurement	Source
Colour	The colour of this wine is:	Not Intense/ Very Intense	Likert 5-point Likert scales scale (1-Not Intense; 5- Very Intense)	Adapted from Wine & Spirit Education Trust (2018)
		I don't like the colour at all /I really like the colour.	5-point Likert scale (1- I don't like the colour at all; 5- I really like the colour)	
Fluidity	As for fluidity, this wine is:	Not fluid at all/ Very fluid	5-point Likert scale (1-Not fluid; 5- Very fluid)	
		I don't like the fluidity at all /I really like the fluidity	5-point Likert scale (1- I don't like the fluidity at all; 5- I really like the fluidity)	
Brightness	As for brightness, this wine is:	Not bright/ Very bright	5-point Likert scale (1-Not bright; 5- Very bright)	
		I don't like the brightness at all/ I really like the brightness	5-point Likert scale (1- I don't like the brightness at all; 5- I really like the brightness)	
Effervescence	As for effervescence, this wine is:	Not effervescent/ Very effervescent	5-point Likert scale (1-Not effervescent; 5- Very effervescent)	
		I don't like the effervescence at all/ I really like the effervescence	5-point Likert scale (1- I don't like the effervescence at all; 5- I really like the effervescence)	

4.2.2. SMELL

Scale		Item	Measurement	Source
Smell	The smell of this wine is:	Not Intense/ Very Intense	5-point Likert scale (1-Not Intense; 5- Very Intense)	Adapted from Wine & Spirit Education Trust (2018)
		Not fruity/ Very fruity	5-point Likert scale (1-Not fruity; 5- Very fruity)	
		Not floral/ Very floral	5-point Likert scale (1-Not floral; 5- Very floral)	
		Not woody/ Very woody	5-point Likert scale (1-Not woody; 5- Very woody)	
		Not pleasant/ Very pleasant	5-point Likert scale (1-Not pleasant; 5- Very pleasant)	
		I don't like the smell at all/ I really like the smell	5-point Likert scale (1- I don't like the smell at	

		all; 5- I really like the smell)	

4.2.3. TASTE

Scale		Item	Measurement	Source
Taste	The taste of this wine is:	Not Intense/ Very Intense	5-point Likert scale (1-Not Intense; 5- Very Intense)	Adapted from Wine & Spirit Education Trust (2018)
		Not sweet/ Very sweet	5-point Likert scale (1-Not sweet; 5- Very sweet)	
		Not acidic/ Very acidic	5-point Likert scale (1-Not acidic; 5- Very acidic)	
		Not fruity/ Very fruity	5-point Likert scale (1-Not fruity; 5- Very fruity)	
		Not full bodied/ Very full bodied	5-point Likert scale (1-Not full bodied; 5- Very full bodied)	
		Not alcoholic/ Very alcoholic	5-point Likert scale (1-Not alcoholic; 5- Very alcoholic)	
		Not pleasant/ Very pleasant	5-point Likert scale (1-Not pleasant; 5- Very pleasant)	
		I don't like the taste at all/ I really like the taste	5-point Likert scale (1- I don't like the taste at all; 5- I really like the taste)	

4.2.4. PERCEPTION

Scale	Item	Measurement	Source
Product Evaluation (general)	I like the look of this wine/ I like the smell of this wine/ I like the taste of this wine/ I like this wine.	5-point Likert scale (1- Strongly Disagree; 5- I totally agree)	Adapted from Trudel, Argo, & Meng (2016, p. 27)
Product Evaluation (food)	From this appearance, I want to taste this wine/ From this smell, I want to taste this wine/ From this flavour, I want to taste this wine/ From this experience, I want to consume more of this wine.		Adapted from White, Lin, Dahl, & Ritchie (2016, p. 21)
	For me, this wine has high quality.		
Brand Expectations	I have high expectations for this wine/ I have high expectations regarding the growth of this wine		Adapted from Hult, Morgeson, Morgan, Mithas, & Fornell (2017, p. 52)

4.2.5. INTENTION

Scale	Item	Measurement	Source
Willingness To Purchase	In the next 3 months I intend to buy this wine.	5-point Likert scale (1- Strongly Disagree; 5- I totally agree)	Adapted from White, Lin, Dahl, & Ritchie (2016, p. 15)
Willingness To Purchase a Product as a Gift	I would buy this wine to give to a family member or friend.		Adapted from Wolter & Cronin Jr. (2016, p. 406)
Word-of-mouth Intention	I would recommend this wine to a family member or friend.		Adapted from Maxham III & Netemeyer (2002, p. 252)

4.2.6. POSITIONING

Scale	Item	Measurement	Source
Product Evaluation (food)	This wine will have a premium position.	5-point Likert scale (1- Strongly Disagree; 5- I totally agree)	Adapted from White, Lin, Dahl, & Ritchie (2016, p. 21)
Brand Affordability	This wine has a high price.		Adapted from De Langhe, Fernbach, & Lichtenstein (2016, p. 9)
	This wine has many sales.		

4.2.7. PRICE PERCEPTION

Scale	Item	Measurement	Source
Price Familiarity With a Product Category	How much do you think a 750mL bottle of this wine costs?	Short open answer	Adapted from (Habel, Schons, Alavi, & Wieseke, 2016, p. 103)

4.2.8. WILLINGNESS TO PAY

Scale	Item	Measurement	Source
Willingness to Pay More	What is the maximum amount you would be willing to pay for a 750mL bottle of this wine?	Short open answer	Adapted from (Habel, Schons, Alavi, & Wieseke, 2016, p. 102)

The questionnaires applied are depicted in Annexes C, D, E and F.

4.3. EXPERIMENTAL PROCEDURE

In order to reach our research goals, a quantitative data collection method assessing the wine experience was used, designed in a four-stages wine tasting/interaction experiment, in order to study the three main wine-related senses – sight, smell and taste separately, and then all together. The objects of the study were two different red wines that were selected by the company that sponsored this investigation, Sogrape (see Figure 3), based on the purpose of this study. These two red wines are, according the technical expertise of the company Sogrape, clearly different in terms of appearance, smell and taste, thus being able to be successfully used in the implementation of this research. By experiencing and comparing – in a blind way – two different red wines in terms of appearance, smell and taste, this research will provide further contributions about the role that senses can provide in the wine consumption experience. The products of the study are, then, "Framingham Marlborough" (see annex A) and "Herdade do Peso Trinca Bolotas" (see annex B). A detailed characterization of both wines is presented in table 4.1.

Figure 3 Sogrape, sponsor of the experiment

Table 4.1 Characteristics of the two wines

Characteristics	Framingham Marlborough	Herdade do Peso Trinca Bolotas
Bottle		
Wine glass		
Type	Still Red	Still Red
Year	2020	2020
Country	New Zealand	Portugal
Region	Marlborough	DOC Alentejo
Grape type	Pinot Noir (pure varietal)	44% Alicante Bouschet, 40% Touriga Nacional, 16% Aragonez

Maturation	In French oak barriques for 10 months (20% new, 80% old).	In stainless steel tank for 6 months.
Appearance	Pale ruby	Intense ruby
Smell	Earthy nose, subtle oak, reminiscent of smoked meat, light florals, red and blue fruits.	Red fruit with floral notes
Taste	Dark cherry and red berry flavours with, mineral notes. Fine, supple, well integrated tannin structure.	Very smooth tannins and a refreshing acidity. Long finish.
Alcohol	13.5%	14%
Acidity	6.0 g/l	5.8g/l
pH	3.7	3.7

(Source: Sogrape – see annexes 7 and 8)

The design is single cross-sectional as the procedure occurred one time. The experience's four phases expected to analyse the appearance of the wine, the smell, the taste, and all the senses together, respectively. The experiment developed as follows:

Phase 1: The participant first finds himself in a space where there is a table with a white tablecloth and two glasses, each one with a different wine sample. The participant can observe one glass, being allowed to lift and turn it to analyse the visual factors of the wine. However, he/she may neither smell nor taste it. Next, the participant is given the questionnaire number 1, being able to re-analyse the wine anytime he/she needs. After that, the participant gives the questionnaire filled one of the assistants in the experiment and repeats the steps for the second sample. The order of tasting is aleatory and the questionnaire is the same (see annex C). In each of them, the assistant writes a code which refers to the respective wine (F1 for Framingham Marlborough Pinot Noir 2020 and H2 for Herdade do Peso Trinca Bolotas 2020). The participant has to give the questionnaire to the assistant to avoid consulting the previous questionnaire when answering the second one, which could bias the results. Both are given to the second assistant at the beginning of the second phase.

Phase 2: This one occurs in a second place, where people can't look at the table of the 1st phase in order to avoid comparisons and biases. In this part of the experiment, the person is invited to put on a mask to blindfold the eyes before the wines are served, in order to eliminate the sense of sight and focus only on the smell: the participant can only smell the glass of wine, not being able to see or taste it. During all the experiment, all bottles were covered with black cardboard which made it impossible to recognise the brand or the wine. The wine was served at room temperature. After smelling the first sample, the glass is covered with an opaque cloth so that it is impossible to see its content before unveiling the eyes. The participant is given the second questionnaire (see annex D). After answering to it, the person is invited to smell a container with coffee beans to nullify the odour. Then, he/she has to put on the mask again and smell the second sample. The procedure is the same as for the first wine and the questionnaire is

equal too; the order is aleatorily chosen by the assistant. The assistant will have put a code in each questionnaire in regard of the respective wine (M1 for Framingham Marlborough Pinot Noir 2020 and T2 for Herdade do Peso Trinca Bolotas 2020). The four questionnaires are regrouped and given to the third assistant at the beginning of the third phase.

Phase 3: This one occurs in the same place as the previous one. In this part of the experiment, the person is, again, invited to put on a mask to blindfold the eyes before the wines are served, again, to eliminate the sense of sight. In this phase the participant can taste the glass of wine, not being able to see it. After tasting the first sample, the glass is covered with an opaque cloth so that it is impossible to see its content before unveiling the eyes. The participant is given the third questionnaire (see annex E). After answering to it, the person is invited to smell a container with coffee beans to nullify the odour, eat water and salt biscuits to cancel out the taste and drink water to remove the residues from the previous wine (see Figure 4). He/she has to put on the mask again and will taste the second sample. The procedure is the same as for the first wine and the questionnaire is equal too; the order is aleatorily chosen by the assistant. The assistant will have put a code in each questionnaire in regard of the respective wine (M1 for Framingham Marlborough Pinot Noir 2020 and T2 for Herdade do Peso Trinca Bolotas 2020). The six questionnaires are regrouped and given to the fourth assistant at the beginning of the fourth and last phase.

Figure 4 Sensory experience environment

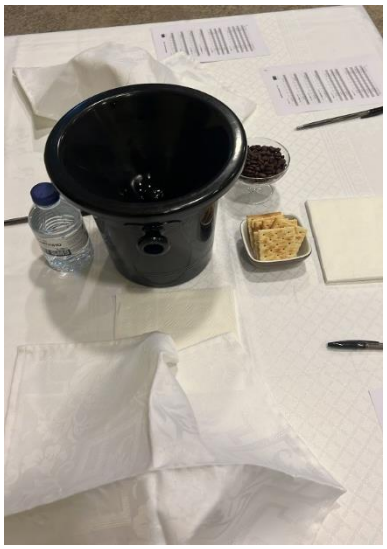


Figure 5 Participant answering one of the questionnaires of phase 4



Phase 4: This one occurs in the same place as the previous ones. In this part of the experiment, the person is having a “normal” wine taste experience: the participant can see, smell and taste the wine samples. After tasting the first sample, the glass, the participant is given the fourth questionnaire (see annex F). After answering to it, between the two samples, the person is invited to smell a container with coffee beans to nullify the odour, eat water and salt biscuits to cancel out the taste and drink water to remove the residues from the previous wine. He/she will taste the second sample. The questionnaire is the same as for the first wine sample; the order is aleatorily chosen by the assistant (see Figure 5). The assistant will have put a code in each

questionnaire in regard of the respective wine (P1 for Framingham Marlborough Pinot Noir 2020 and B2 for Herdade do Peso Trinca Bolotas 2020).

The eight questionnaires are regrouped and given to the fifth assistant that provides the participants with a socio-demographic questionnaire (see annex G). The nine questionnaires are then collected, stapled and stored. The experience is finished.

This experience occurred on the 1st April 2023 in the D. Diogo de Sousa Museum, which was also our sponsor for this event (see Figure 6).

Figure 6 D. Diogo de Sousa Museum, sponsor of the event



4.4. Characterization of the sampling procedures

With the purpose of attracting participants to participate in the experiment, an advertisement was created and disseminated online (via LinkedIn and Instagram) and offline (displaying posters and distributing flyers) (see annex H). The sample produced a non-probabilistic sampling approach, indicating that the sample was chosen from the population in a non-random manner, and not all population elements were included in the sample (Malhotra, 2017, p. 419). The advantages of this process are that it is less expensive than probability samples of the same size, involves less time in the data collection process and can produce samples that are sensibly representative when carried out correctly. Despite these benefits, sampling error cannot be calculated, we don't know the degree to which the sample is representative of the population of interest and the results cannot be projected to the total population (Malhotra, 2017, pp. 433, 434). The non-probability sampling techniques were, at the same time, convenience sampling and snowball sampling, has some participants were at the place of the experiment in the moment when it happened, others got informed by the communication elements that were distributed, and others participated because they had been informed by other people (Malhotra, 2017, pp. 420, 424).

4.5. Data analysis procedures

After the collection of all inquiries, the answers were all passed to the software IBM SPSS Statistic in order to assemble the information and perform the descriptive analysis of the sample profile through

the demographic data of the participants which regards the answers of the last questionnaire (see annex G). Then, to investigate the relationships among latent variables, we decided to use the SmartPLS4 software to apply the Partial Least Squares Structural Equation Modelling (PLS-SEM) methodology. PLS-SEM has been widely applied in social science investigations as it provides causal explanations. Also, it is a solution for the problem of the small sample size and in investigations when the model contains many constructs and a consequent number of items, which is our case (Wold, 1982; Sarstedt, Ringle, & Hair, 2017; Fornell & Bookstein, 1982; Willaby, Costa, Burns, MacCann, & Roberts, 2015; Hair, Hult, Ringle, Sarstedt, & Thiele, 2017, as cited in Hair, Risher, Sarstedt, & Ringle, 2019, pp. 4, 6). One of the main reasons that took us to use this tool in order to develop the results analysis is the fact that it allows to study the impact of variables that surge from a formative model in a variable that expresses a reflective model (Sarstedt, Ringle, & Hair, 2020, p. 6). In our case, the formative model is present in the independent variables sight, smell and taste, because they are a result of other independent variables: sight is influenced by colour, colour appreciation, fluidity, fluidity appreciation, brightness, brightness appreciation, effervescence and effervescence appretiation; smell is the result of intensity, fruitiness, florality, woodiness, pleasantness and general appreciation; taste is impacted by intensity, sweetness, acidity, fruitiness, woodiness, full-bodieness, alcohol, pleasantness and general appreciation. And the variables that display a reflective model are wine perception, intention to buy and positioning. Wine perception has an impact on wine appreciation, interest in consuming, perception of quality and expectations; intention to buy will have an influence on the intention to buy the wine in short term, in willingness to offer the wine and in willingness to recommend; lastly, positionning will have an effect on premium positioning perception, price awareness and sales perception.

5. Results and Findings

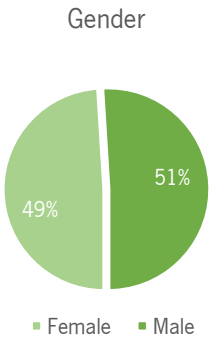
The sensory experiment that allowed us to test the study hypotheses raised had the participation of 51 individuals. The results obtained are shown in this chapter.

5.1. Sample description

5.1.1. Gender

The sample shows an equative gender variation, as there were 25 females (49%) and 26 males (51%) (*Mo* =1), as indicated in the Figure 7.

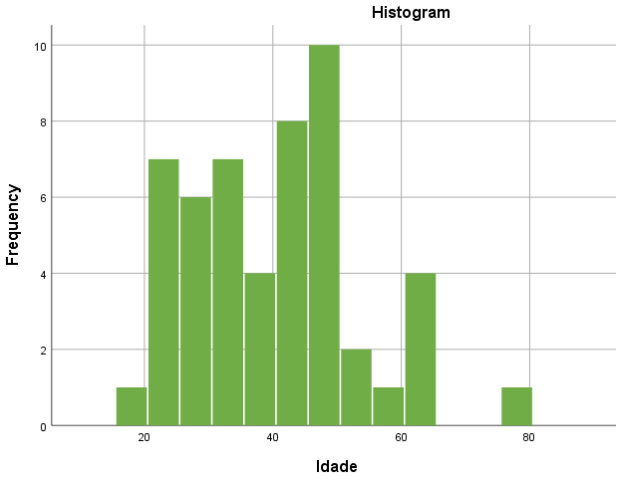
Figure 7 Gender distribution



5.1.2. Age

Regarding the age, the participants' ages vary between 18 and 77 (*M* =40,02, *SD* =13,25), and the distribution is specified in the Figure 8.

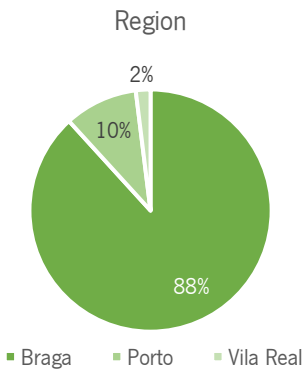
Figure 8 Age distribution of the sample



5.1.3. Region

The totality lives in Portugal, and the great majority, 45, is from Braga (88,2%), 5 are from Porto (9,8%) and 1 is from Vila Real (2%) (*Mo* =1) (see Figure 9).

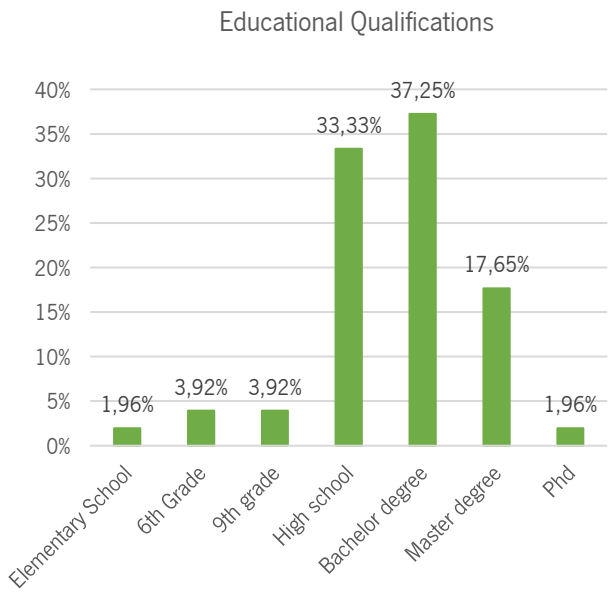
Figure 9 Region distribution



5.1.4. Education

As regards educational qualifications, 1 has concluded the elementary school (2%), 2 went to school until the 6th grade (3,9%), 2 until the 9th grade (3,9%), 17 finished high school education (33,3%), 19 have a university bachelor degree (37,3%), 9 have a master degree (17,6%) and 1 has a doctoral programme (2%) (*Mdn* =5, *IQR* =1) (see Figure 10).

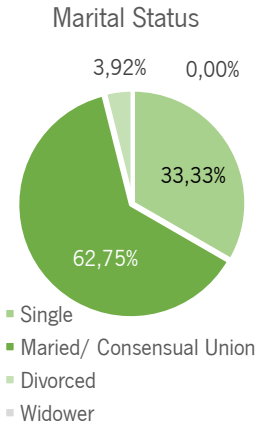
Figure 10 Educational qualifications



5.1.5. Marital Status

Concerning marital status, 17 are single (33,3%), 32 are married or in a consensual union (62,7%) and 2 are divorced (3,9%). There was also the option "Widower", that was not chosen by anyone (0%) (*Mo* =2) (see Figure 11).

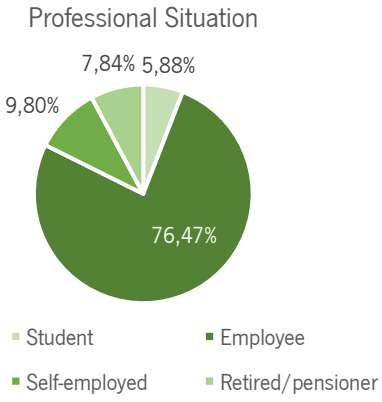
Figure 11 Marital Status distribution



5.1.6. Professional Situation

And in terms of professional situation, 3 are students (5,9%), 39 are employees (76,5%), 5 are self-employed workers (9,8%) and 4 are retired/pensioners (7,8%) (*Mo* =2) (see Figure 12).

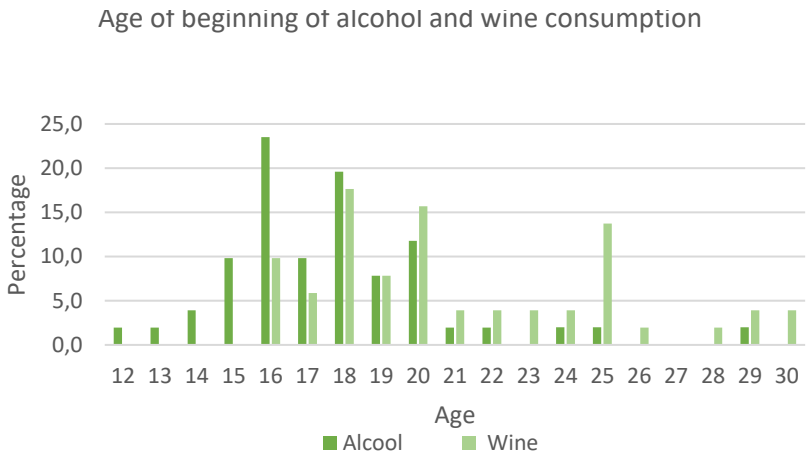
Figure 12 Professional situation distribution



5.1.7. AGE OF BEGINNING OF ALCOHOL AND WINE CONSUMPTION

The age with which the sample started drinking alcoholic beverages varies between 12 and 29 years (*M* =17,69, *SD* =2,98). However, the data show an age rise when we ask for starting wine consumption, as they vary between 16 and 30 (*M* =21,12, *SD* =3,99) (see Figure 13).

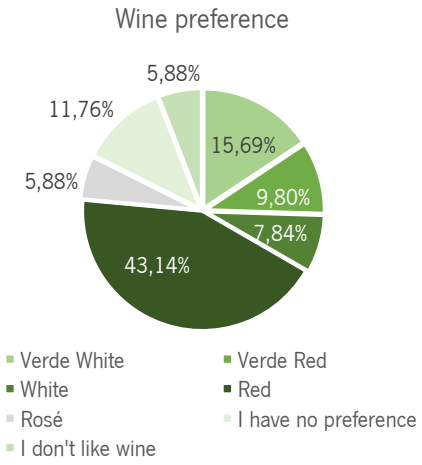
Figure 13 Age of beginning of alcohol and wine consumption



5.1.8. WINE PREFERENCE

The favourite wine is red for 22 people (43,14%), white wine from the region of the Vinhos Verdes for 8 participants (15,69%), 6 don't have any preference (11,76%), 5 prefer red wine from the region of the Vinhos Verdes (9,8%), 4 have a preference for white wines (7,84%), 3 of them have a special interest in rosé wines (5,88%) and 3 don't like wine at all (5,88%) (*Mo* =4) (see Figure 14).

Figure 14 Wine preference



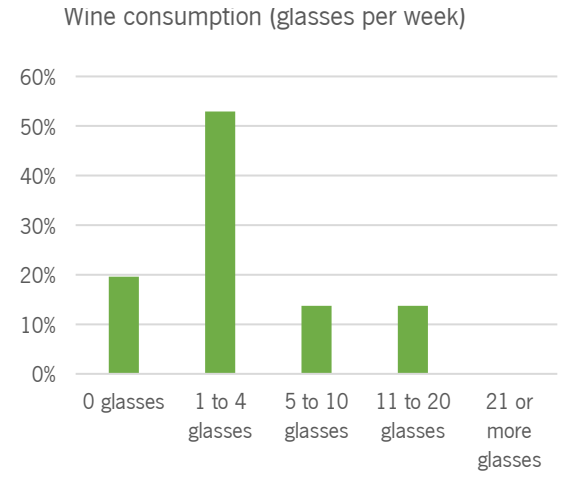
5.1.9. ALCOHOL CONSUMPTION

The participants were asked, on average, how often do they drink alcohol per week, to which 4 replied "Never" (7,8%), 32 replied "1 to 2 times a week" (62,7%), 6 said they drink "3 to 5 times a week" (11,8%) and 9 drink "6 or more times a week" (17,6%) (*Mdn* =2, *IQR* =1) (Figure 15). When we asked specifically for wine, they replied as follows: 10 never drink wine (19,6%), 28 drink "1 to 2 times a week" (54,9%), 6 have wine "3 to 5 times a week", and 7 drink wine "6 or more times a week" (13,7%) (*Mdn* =2, *IQR* =1) (Figure 16). So, the wine consumption profile of the sample is very moderate and responsible.

Figure 15 Alcohol consumption (times per week)



Figure 16 Wine consumption (glasses per week)

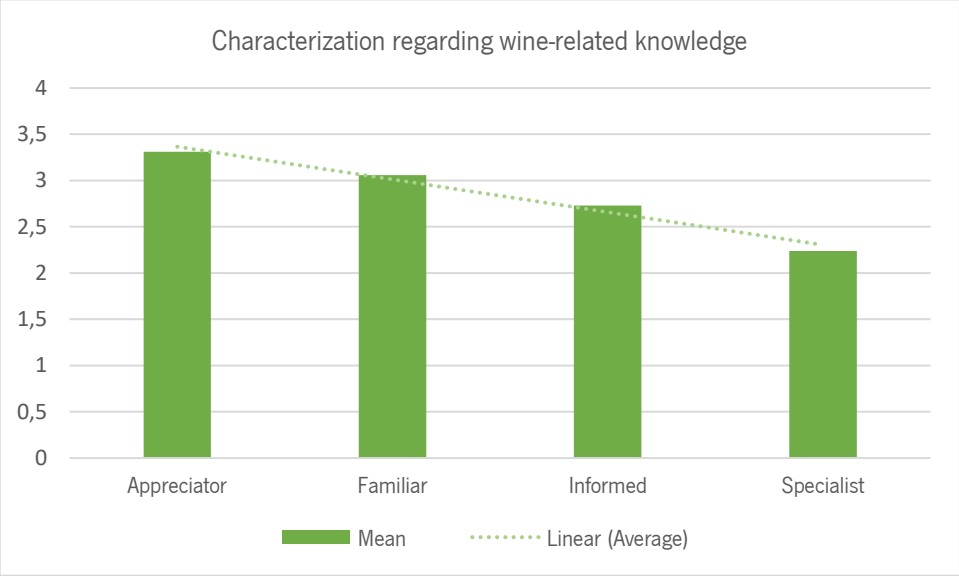


5.1.10. CHARACTERIZATION REGARDING WINE-RELATED KNOWLEDGE

As regards the characterization of de sample in terms of wine consumers, it was possible to understand that in terms of wine appreciation, in a 5-point Likert scale from "Not Appreciator" to "Very Appreciator", the mean of answers is 3,31 and the answers vary between 1 and 5 (*SD* =1,14).

Considering familiarization with wine, the mean of the sample is 3,06 in a 5-point Likert scale starting in "Not familiarized" and ending in "Very familiarized" and the answers vary between 1 and 5 (*SD* =1,256). In the matter of being or not informed, in a 5-point Likert scale from "Not Informed" to "Very Informed", the mean is 2,73 (*SD* =1,002) and the answers differ between 1 and 5. Apropos of expertise, the sample shows a mean of 2,24 (*SD* =1,012) in a 5-point Likert scale starting in "Not Specialist" and ending in "Very Specialist", the lower answer was 1 and the higher was 5 (see Figure 17). These four questions were responded by the totality of the participants of the experience (n =51).

Figure 17 Characterization regarding sample's Wine-related Knowledge



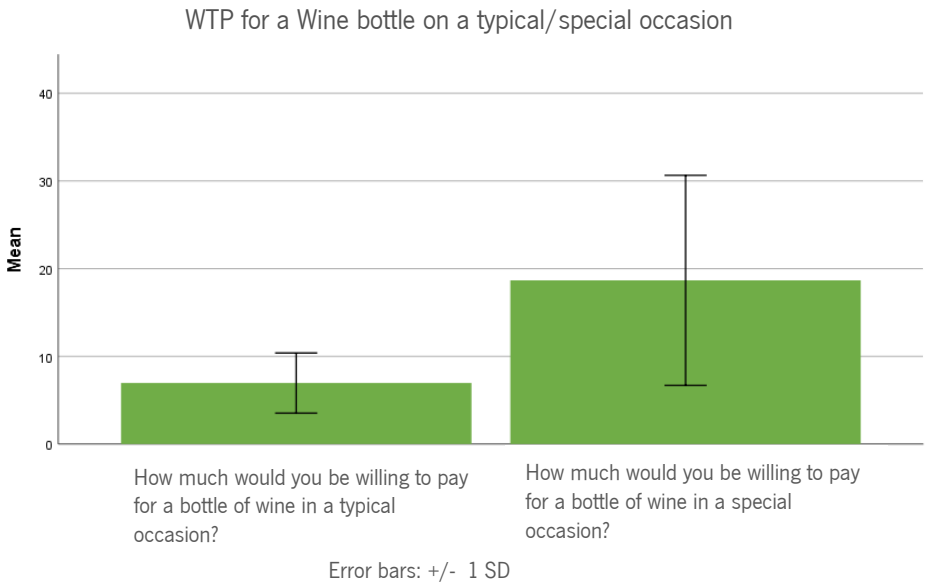
It was expected to understand what is their sensitivity in terms of wine prices, as well as their consumption habits regarding the amount invested in wine, in euros. Concerning the familiarization with the general prices of wine, the sample has a mean of 2,78 in a 5-point Likert scale starting in "Not at all familiar with the usual wine prices" and ending in "Very familiar with the usual wine prices" (*SD* =1,064) and it was answered by 100% of the sample. For this sample, the knowledge of the appropriate price of a 750mL bottle of wine shows a mean answer of 2,86 in a 5-point Likert scale starting in "I don't know what the appropriate price would be for a 750mL bottle of wine" and ending in "I know what the appropriate price would be for a 750ml bottle of wine" (*SD* =1,161) and the question was answered by 50 participants, as 1 person did not reply to it (see Figure 18).

Figure 18 Wine prices awareness



The participants were then asked how much they were willing to pay in a typical occasion and in a special occasion, in two short open-ended questions. The mean of the value that the sample is willing to pay in a typical occasion is €6,96 and the answers diverge among €2 and €15 (in a total of 51 replies) (*SD* =3,428). However, in a special occasion, there were 51 answers starting in €4 and ending in €50 and the mean is €18,67 (*SD* =11,976) (see Figure 19).

Figure 19 WTP for a wine bottle



5.2. Analysis of the model Constructs

As previously mentioned, the sample is made up of 51 people who completed the same questionnaires twice, once for wine 1 and once for wine 2, yielding 102 responses. We used PLS to test the constructs and hypotheses and bootstrapped with 5000 resamples to establish several pseudo-samples and an empirical sampling distribution (Hair, Ringle, & Sarstedt, 2011, p. 148). The resulting bootstrap distribution shows the variation in the model parameters that were calculated. We may approximate the standard error for each parameter by using the bootstrap standard deviation, which enables us to evaluate the significance and uncertainty of the calculated coefficients (Henseler, Ringle, & Sinkovic, 2009, as cited in Hair, Ringle, & Sarstedt, 2011, p. 148).

We examined each construct—Sight, Smell, Taste, Sensory Perception, Perception, Intentions, Positioning, and Willingness to Pay—using the participants' responses to the questions. Cronbach's alpha and Composite Reliability (CR) analysis of the model's constructs must be conducted in order to verify each construct's reliability, and both metrics must be higher than 0.70 to indicate that the constructs' reliability is sufficient (Vinzi, Trinchera, & Amato, 2010, p. 50). In addition, convergent validity is a criterion that must be measured to assess the construct's quality. The Average Variance Extracted (AVE) is used to determine it, and for the construct to be rated of excellent quality, the AVE must be more than .50 and lower than the CR (Fornell & Larcker, 1981, as cited in Alhaddad, 2015, p. 4). Also, it has been verified that the square root of the AVE was greater than the correlations with all the other construct in the model, which demonstrates evidence of discriminant validity (Vinzi, Trinchera, & Amato, 2010, p. 437). The summarized results of CR and AVE can be found in Table 5.1 and Table 5.2. Then, the values obtained indicate that the criteria for internal consistency, item reliability, convergent validity and discriminant validity were met for all constructs analysed.

The mean, standard deviation, skewness and kurtosis of all the items of the three first phases are discriminated in the Annex I, and of all the items of the fourth phase are depicted in Table 5.3. They allow the evaluation of the normality distribution of data. In a normal distribution, skewness should be between -2 and +2 and kurtosis should be between -7 and +7 (Abdullahi Hassan Gorondutse, 2014, p. 109).

5.3. Isolated Sensory Experiences

One of our first objectives was to evaluate which of the elements of each sense have more impact in its perception and also to elucidate about which attitude each sense influences the most. For that, we analysed the results of each sense (isolated experiences - phase 1 – only sight; phase 2 – only smell;

and phase 3 – only taste); and then we analysed the results of the integrated experience (phase 4 – all the senses at the same time).

The results of both wines were first examined, and we came to the conclusion that the appreciation of colour intensity (β=0.558; p<0.001) and effervescence appreciation (β=0.207; p<0.05) are the sensory inputs that have the greatest influence on how people perceive the wine through vision, followed by brightness intensity in a lesser degree (β=0.177; p<0.1) (Table 5.1).

Keeping with the study of each wine separately, the impression of wine 1 is mostly shaped by the appreciation of colour intensity (β=0.587; p<0.001), however fluidity also plays a larger effect (β=0.209; p<0.05). On the other hand, wine 2's sensory perception places higher weight on the brightness appreciation (β=0.504; p<0.05) and colour intensity appreciation (β=0.492; p<0.05).

The analysis of the impact of vision on the consumer's attitude toward the wine came after this evaluation and the following results are derived from the data of table 5.1. Taking into account the outcomes for both wines, the results show that vision had a greater influence on wine perception (β=0.794; p<0.01), followed by the wine positioning (β=0.656; p<0.01), intention to buy the wine (β=0.649; p<0.01), price perception of the wine (β=0.369; p<0.01), and then in WTP for the wine (β=0.326; p<0.01). Assessing each wine separately, we observed a greater influence of vision in wine 1 on wine perception (β=0.870; p<0.01), intention to buy the wine (β=0.761; p<0.01), wine positioning (β=0.744; p<0.01), price perception of the wine (β=0.309; p<0.01) and WTP for the wine (β=0.281; p<0.005). Yet we see that the wine 2 is the one where vision has the greatest influence on wine perception (β=0.739; p<0.01), wine positioning (β=0.576; p<0.01), intention to buy the wine (β=0.549; p<0.01), wine price perception (β=0.436; p<0.01) and WTP for the wine (β=0.372; p<0.01). Finally, according to our data and when analysed singly, the vision can explain 63,1% of the variance in wine perception; 43,1% of the variance in wine positioning; 42,2% in intention to buy the wine; 13,6% of price perception; and 10,6% of the variance of WTP.

As regards the smell, considering the wines together, the sensory inputs that have the most impact in smell perception are smell appreciation (β=0.512; p<0.01), followed by fruitiness (β=0.233; p<0.05) and intensity (β=0.231; p<0.05). When considering each wine separately, regarding the wine 1, smell appreciation (β=0.785; p<0.01) has more impact in smell perception, followed by woodiness (β=0.223; p<0.05), however, it's in wine 2 that smell intensity (β=0.387; p<0.01), pleasantness (β=0.308; p<0.1) and appreciation (β=0.304; p<0.1) have a bigger impact in smell perception (Table 5.1).

The analysis of the impact of smell on the consumer's attitude toward the wine came after this evaluation. As regards both wines' results, we could conclude that smell has a bigger impact in wine perception (β=0.848; p<0.01), followed by intention to buy the wine (β=0.724; p<0.01), wine positioning (β=0.711; p<0.01), price perception of the wine (β=0.363; p<0.01) and WTP for the wine (β=0.304; p<0.01). For the wine 1, smell is more responsible for wine perception (β=0.895; p<0.01), wine positioning (β=0.821; p<0.01), intention to buy the wine (β=0.707; p<0.01), wine price perception (β=0.341; p<0.01) and WTP for the wine (β=0.171; p<0.01). Yet, it is in wine 2 that wine perception (β=0.801; p<0.01), intention to buy the wine (β=0.772; p<0.01), positioning of the wine (β=0.634; p<0.01), WTP for the wine (β=0.442; p<0.01) and price perception of the wine (β=0.405; p<0.01) are more influenced by the sense of smell. Finally, according to our data and when analysed singly, the smell can explain 71,9% of the variance in wine perception; 52,4% in intention to buy the wine; 50,6% of the variance in wine positioning; 13,2% of price perception; and 9,2% of the variance of WTP (Table 5.1).

Considering taste, while evaluating all wines together, we realize that the sensory inputs that have the most impact in taste perception of the wine are the body (β=0.398; p<0.01), appreciation (β=0.387; p<0.01), pleasantness (β=0.337; p<0.05) and fruitiness (β=0.206; p<0.05). Testing each wine individually, the results show that for the wine 1, the body has more impact in taste perception (β=0.649; p<0.01), followed by pleasantness (β=0.363; p<0.1), appreciation (β=0.360; p<0.1) and intensity in a lower level (β= -0.243; p<0.1) – here we also constate that a lower level of intensity is more favourable to taste perception. For wine 2, the sensory inputs that have more impact in taste perception are appreciation (β=0.571; p<0.01), pleasantness (β=0.373; p<0.05) and the characteristic of being alcoholic (β=0.280; p<0.05) (Table 5.1).

As regards the impact of taste in consumer's attitude toward the wine, the data collected for both wines together shows that this sense has more impact in wine perception (β=0.904; p<0.01), then in intention to buy the wine (β=0.838; p<0.01), followed by positioning of the wine (β=719; p<0.01), WTP for the wine (β=0.433; p<0.01), and finally wine price perception (β=0.367; p<0.01). Then, evaluating each wine separately, the results are similar, as taste impacts mainly wine perception, especially for wine 1 (β=0.928; p<0.01) than for wine 2 (β=0.892; p<0.01), followed by intention to buy the wine, with lower results in wine 1 (β=0.832; p<0.01) than in wine 2 (β=0.866; p<0.01), then comes positioning of the wine, that suffers more impact from taste in wine 1 (β=0.769; p<0.01) than in wine 2 (β=0.742; p<0.01). In wine 1, the fourth variable most impacted by taste is WTP for the wine (β=0.713; p<0.01), followed by price perception of the wine (β=0.653; p<0.01). For wine 2, the fourth most influenced variable is

WTP for the wine (β=0.250; p<0.1). Finally, according to our data and when analysed singly, the smell can explain 81,8% of the variance in wine perception; 70,2% in intention to buy the wine; 51,7% of the variance in wine positioning; 18,7% of the variance of WTP for the wine; and 13,4% of wine price perception (Table 5.1).

Table 5.1 Structural Models – Isolated Sensory Experiences

Constructs	**Wine 1**	**Wine 2**	**Path Coef Diff.**	**Wines together**	
	Path Coef (β)	**Path Coef (β)**		**Path Coef (β)**	**R-square**
Only Sight					
Colour 1 -> Sight	-0.010	0.127	-0.136	0.140	
Colour 2 -> Sight	0.587***	0.492**	0.095	0.558***	
Fluidity 1 -> Sight	0.209**	0.097	0.112	0.141	
Fluidity 2 -> Sight	0.015	-0.184	0.199	-0.115	
Brightness 1 -> Sight	0.154	0.173	-0.019	0.177*	
Brightness 2 -> Sight	0.170	0.504**	-0.334	0.340	
Effervescence 1 -> Sight	0.144	-0.015	0.160	0.052	
Effervescence 2 -> Sight	0.208	0.144	0.065	0.207**	
Sight -> Wine perception	0.870***	0.739***	0.131**	0.794***	0.631
Sight -> Intention to buy	0.761***	0.549***	0.212*	0.649***	0.422
Sight -> Positioning	0.744***	0.576***	0.168	0.656***	0.431
Sight -> Price perception	0.309***	0.436***	-0.127	0.369***	0.136
Sight -> WTP	0.281**	0.372***	-0.091	0.326***	0.106
Regarding all reflective constructs: Cronbach's Alpha varied from 0.845 to 0.882; Factor loadings varied from 0.803 to 0.941; CR varied from 0.861 to 0.923; AVE varied from 0.737 to 0.809.					
Only Smell					
Intense -> Smell	0.080	0.387***	-0.306	0.231**	
Fruity -> Smell	0.246	0.171	0.075	0.233**	
Floral -> Smell	-0.033	0.099	-0.132	0.028	
Woody -> Smell	0.223**	0.003	0.219	0.117	
Pleasant -> Smell	-0.018	0.308*	-0.326	0.178	
Appreciation -> Smell	0.785***	0.304*	0.481	0.512***	
Smell -> Wine perception	0.895***	0.801***	0.094*	0.848***	0.719
Smell -> Intention to buy	0.707***	0.772***	-0.065	0.724***	0.524

Smell -> Positioning	0.821***	0.634***	0.188**	0.711***	0.506
Smell -> Price perception	0.341***	0.405***	-0.064	0.363***	0.132
Smell -> WTP	0.171***	0.442***	-0.272	0.304***	0.092
Regarding all reflective constructs: Cronbach's Alpha varied from 0.912 to 0.940; Factor loadings varied from 0.808 to 0.967; CR varied from 0.915 to 0.944; AVE varied from 0.847 to 0.879.					
Only Taste					
Intense -> Taste	-0.243*	-0.012	-0.231	-0.138	
Sweet -> Taste	-0.136	-0.069	-0.067	-0.102	
Acid -> Taste	0.033	0.002	0.032	-0.051	
Fruity -> Taste	0.202	0.278	-0.076	0.206**	
Woody -> Taste	-0.007	-0.016	0.009	-0.023	
Full-bodied -> Taste	0.649***	-0.140	0.789***	0.398***	
Alcoholic -> Taste	-0.193	0.280**	-0.474**	0.034	
Pleasant -> Taste	0.363*	0.373**	-0.010	0.337**	
Appreciation -> Taste	0.360*	0.571***	-0.211	0.387***	
Taste -> Wine perception	0.928***	0.892***	0.036	0.904***	0.818
Taste -> Intention to buy	0.832***	0.866***	-0.034	0.838***	0.702
Taste -> Positioning	0.769***	0.742***	0.027	0.719***	0.517
Taste -> Price perception	0.653***	0.219	0.434***	0.367***	0.134
Taste -> WTP	0.713***	0.250*	0.463***	0.433***	0.187
Regarding all reflective constructs: Cronbach's Alpha varied from 0.888 to 0.953; Factor loadings varied from 0.911 to 0.966; CR varied from 0.914 to 0.954; AVE varied from 0.817 to 0.910.					

***** p < 0.01 | ** P < 0.05 | * p < 0.10**

(Source: PLS)

5.4. INTEGRATED SENSORY EXPERIENCE

With the results of the phase number four, we were able to analyse the integrated impact of the sensory elements – sight; smell and taste - on consumer attitude towards the wine consumption, one experience with all senses at the same time.

While considering the results of sight in the integrated sensorial experience, and firstly viewing the numbers of both wines, the results show that the factors that mainly influence sight perception are effervescence (β=0.412; $p<0.01$), followed by the appreciation of brightness (β=0.380; $p<0.05$), colour

intensity perception (β=0.374; p<0.05), effervescence appreciation (β= -0.309; p<0.05) - which is negative, meaning that consumers have a better sight perception when the wine is less effervescent. The following input is, with less impact, the appreciation of fluidity (β=0.283; p<0.1) (Table 5.2). Then, we separated each wine to understand which parameters impacted sight the most. While in wine 1 the findings show that the factor that mainly influences wine visual perception is the appreciation of fluidity (β=0.537; p<0.01), followed by colour intensity (β=0.452; p<0.05) and brightness appreciation (β=0.443; p<0.05), in wine 2 the sensory elements that exert the most significant influence on visual perception of the wine are effervescence appreciation, and the value of β explains that consumers have a better sight perception when the wine is less effervescent (β= -0.719; p<0.01), then we see effervescence intensity (β=0.580; p<0.01) and in third position brightness appreciation, less significant (β=0.584; p<0.1).

Focusing on Smell results, the overall experience reveals that fruitiness is the key characteristics that influences wine perception (β=0.335; p<0.01), then comes appreciation (β=0.365; p<0.05) and pleasantness (β=0.326; p<0.05) (Table 5.2). In wine 1, smell is mostly influenced by fruitiness (β=0.467; p<0.05) and appreciation (β=0.407; p<0.1); on the other hand, wine 2 shows that smell perception is mainly influenced by pleasantness (β=0.422; p<0.1).

Taste results of both wines together explain that this sense's perception is mainly due to the characteristic of being full-bodied (β=0.313; p<0.01), followed by pleasantness (β=0.476; p<0.05), and appreciation (β=0.321; p<0.1) (Table 5.2). The wine 1 reveals that the main element is the body (β=0.388; p<0.05), followed by woodiness (β=0.322; p<0.1). For wine 2, the main taste factor is pleasantness (β=0.717; p<0.01), which is the only one with statistical significance.

After analysing each sense singly, this research aims to understand which of the sensory elements influence consumer's attitude towards the wine the most. Regarding wine perception, we looked firstly for the results of both wines together and the findings show that taste is the main influencing sense on wine perception (β=0.612; p<0.01), followed by sight (β=0.151; p<0.1) (Table 5.2). These results support H3a and H1a, respectively. Looking to each wine separately, sight influences more wine perception in wine 1 (β=0.382; p<0.05) than in wine 2; while taste has a higher influence in wine 2's wine perception (β=0.708; p<0.01) rather than in wine 1 (β=0.508; p<0.01).

The next attitudinal element evaluated is intention to buy the wine. The results show that, looking for the results of both wines, the sense that impacts more intention to buy is taste (β=0.519; p<0.01),

followed by sight (β=0.193; p<0.05), and smell (β=0.187; p<0.05), supporting H3b, H1b and H2b, respectively. The impact of taste on intention to buy is higher in wine 2 (β=0.593; p<0.01) than in wine 1 (β=0.420; p<0.01). In addition, sight is more significant in wine 1 (β=0.397; p<0.01) and smell's impact is only significant when analysing both wines together (Table 5.2).

The third element of attitude is wine positioning, and the results of both wines show that it is mainly impacted by taste (β=0.570; p<0.01) and then by sight (β=0.213; p<0.01), supporting H3c and H1c. Taste is more influencing in wine 2 (β=0.611; p<0.01), but also highly significant in wine 1 (β=0.529; p<0.01); sight impacts significantly only the wine 1 (β=0.282; p<0.05) (Table 5.2).

Then, we tested the effect of the senses in price perception and firstly concluded with the results of both wines that sight is the only sense that significantly influences price perception of the wine (β=0.234; p<0.01), supporting H1d. For wine 1, sight is not as much significant (β=0.321; p<0.1) as in wine 2 (β=0.367; p<0.01); and taste has a higher effect in wine 2's price perception too (β=0.489; p<0.05) (Table 5.2).

WTP was the last element of attitude analysed. From the results of both wines, we found that the only sense that has a significant influence in WTP is taste (β=0.436; p<0.01), supporting H3e; and this influence is stronger in wine 2 (β=0.657; p<0.01) than in wine 1 (β=0.339; p<0.1) (Table 5.2).

Table 5.2 Structural relationships – Integrated sensory experience

Constructs	Wine 1	Wine 2	Path Coef Diff.	Wines altogether	
	Path Coef (β)	Path Coef (β)		Path Coef (β)	R-square VD
Integrated Sensory Experience					
Colour 1 -> Sight	0.452**	0.336	0.116	0.374**	
Colour 2 -> Sight	-0.032	0.063	-0.095	0.113	
Fluidity 1 -> Sight	-0.218	0.243	-0.462*	0.027	
Fluidity 2 -> Sight	0.537***	-0.197	0.734***	0.283*	
Brightness 1 -> Sight	-0.108	0.199	-0.307	0.129	
Brightness 2 -> Sight	0.443**	0.584*	-0.141	0.380**	
Effervescence 1 -> Sight	0.167	0.580***	-0.413**	0.412***	
Effervescence 2 -> Sight	0.145	-0.719***	0.864***	-0.309**	
Intense -> Smell	0.052	0.155	-0.103	0.131	
Fruity -> Smell	0.467**	0.223	0.244	0.335***	
Floral -> Smell	0.053	0.097	-0.044	0.076	
Woody -> Smell	-0.020	0.097	-0.117	0.046	
Pleasant -> Smell	0.288	0.422*	-0.133	0.326**	
Appreciation -> Smell	0.407*	0.294	0.112	0.365**	
Intense -> Taste	0.092	-0.183	0.275	-0.112	

Sweet -> Taste	-0.049	0.157	-0.206	0.049	
Acid -> Taste	-0.237	-0.037	-0.200	-0.070	
Fruity -> Taste	-0.129	-0.006	-0.124	-0.008	
Woody -> Taste	0.322*	0.102	0.221	0.123	
Full-bodied -> Taste	0.388**	0.175	0.213	0.313***	
Alcoholic -> Taste	-0.027	0.056	-0.083	-0.002	
Pleasant -> Taste	0.320	0.717***	-0.396	0.476**	
Appreciation -> Taste	0.245	0.128	0.117	0.321*	
Sight -> Wine perception	0.382**	0.099	0.283	0.151*	
Sight -> Intention to buy	0.397***	0.126	0.271	0.193**	
Sight -> Positioning	0.282**	0.151	0.131	0.213***	
Sight -> Price perception	0.321*	0.367***	-0.046	0.234***	
Sight -> WTP	0.256	0.222	0.033	0.156	
Smell -> Wine perception	0.016	0.116	-0.100	0.137	
Smell -> Intention to buy	0.118	0.178	-0.060	0.187**	
Smell -> Positioning	0.165	0.134	0.032	0.146	
Smell -> Price perception	0.259	-0.159	0.419	0.198	
Smell -> WTP	0.026	-0.163	0.188	0.051	
Taste -> Wine perception	0.508***	0.708***	-0.200	0.612***	0.680
Taste -> Intention to buy	0.420***	0.593***	-0.173	0.519***	0.655
Taste -> Positioning	0.529***	0.611***	-0.082	0.570***	0.700
Taste -> Price perception	0.050	0.489**	-0.438	0.207	0.314
Taste -> WTP	0.339*	0.657***	-0.318	0.436***	0.340
Regarding all constructs: Cronbach's Alpha varied from 0.911 to 0.953; Factor loadings varied from 0.899 to 0.973; CR varied from 0.915 to 0.953; AVE varied from 0.849 to 0.914.					

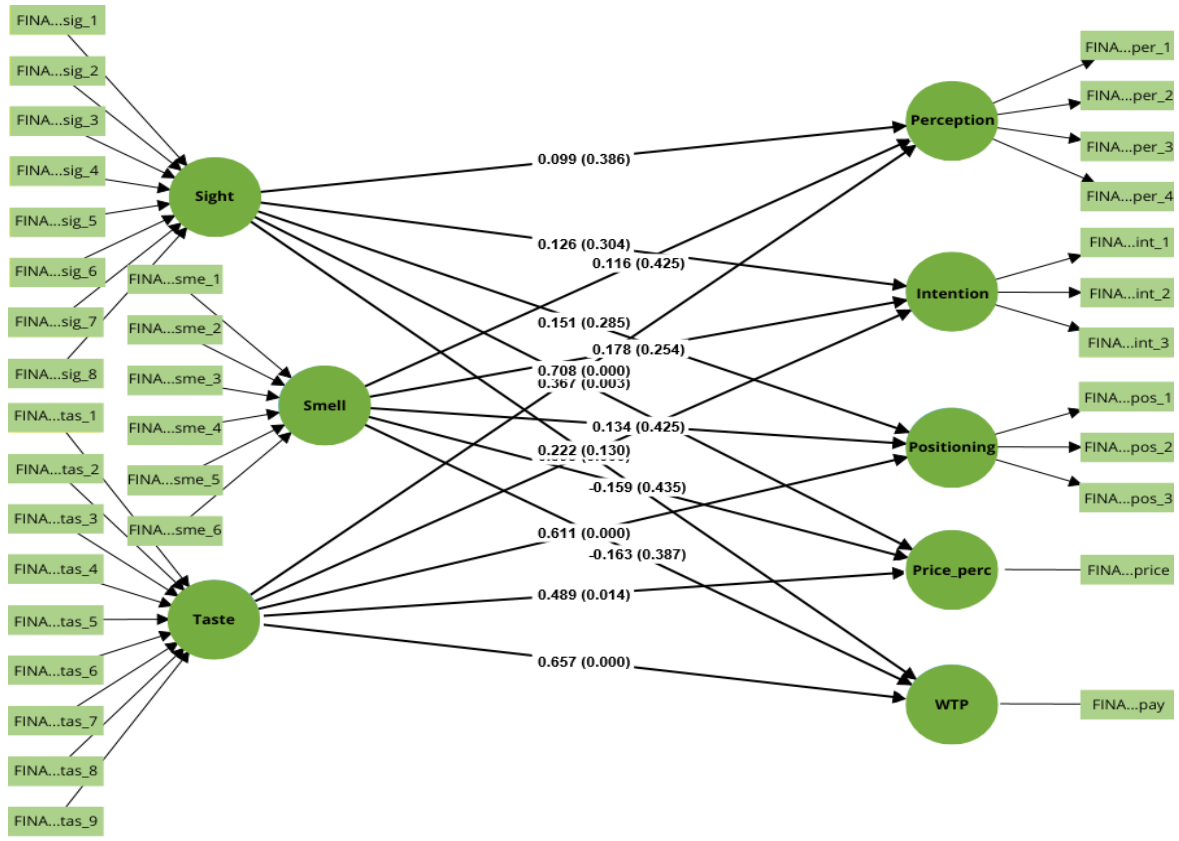
*** p < 0.01 | ** P < 0.05 | * p < 0.10

(Source: PLS)

Finally, according to our data, in an integrated sensory experience, sight, smell and taste together can explain 70% of the variance wine positioning; 68% in wine perception; 65,5% of the variance in intention to buy the wine; 34% of WTP for the wine; and 31,4% of the variance of wine price perception (Table 5.2).

The results of the experience are illustrated in the Figure 20.

Figure 20 Conceptual Model - Integrated sensory experience



The mean, standard deviation, skewness and kurtosis of all the items of the fourth phase, divided by wine 1 and wine 2, are depicted in Table 5.3.

Table 5.3 Descriptive Statistics of the items – Integrated Experience

	Wine 1				Wine 2			
Item	**Mean**	**SD**	**Skewness**	**Kurtosis**	**Mean**	**SD**	**Skewness**	**Kurtosis**
Sight								
Colour 1	2,86	1,132	,452	- ,508	3,75	1,093	- ,806	,04
Colour 2	3,34	1,069	,046	- ,825	3,94	,734	- ,587	,692
Fluidity 1	3,75	,796	- ,244	- ,247	3,31	,735	- ,576	- ,917
Fluidity 2	3,4	,893	- ,14	,132	3,57	,683	- ,494	,118
Brightness 1	3,65	,796	- ,258	- ,22	3,52	,909	- ,401	- ,686
Brightness 2	3,46	,849	,027	- ,52	3,6	,771	- ,931	1,894
Effervescence 1	2,18	1,034	,31	-1,107	2,25	1,074	,37	-1,091
Effervescence 2	2,77	1,077	- ,16	- ,476	2,74	1,226	,107	- ,898

Smell								
Intense	2,78	1,045	,125	-,703	3,27	1,002	-,712	,235
Fruity	2,76	,862	-,295	-,458	3,14	1,02	-,521	-,905
Floral	2,75	,891	,006	-,056	2,96	1,076	-,521	-,692
Woody	2,84	,925	-,308	-,031	2,86	1,069	-,023	-,411
Pleasant	3,12	,895	,112	-,221	3,29	,965	-,079	-,528
Appreciation	3,25	,977	-,007	-,003	3,50	1,055	-,707	,166
Taste								
Intense	3,24	,971	-,09	-,101	3,65	1,016	-,894	,932
Sweet	2,57	,944	-,206	-,792	2,71	1,006	-,104	-,58
Acid	3,02	,905	,129	-,619	2,88	,952	,098	-,327
Fruity	2,96	,947	-,369	-,286	3,06	,968	-,535	-,939
Woody	2,72	,991	-,317	-,873	2,92	1,074	-,141	-,864
Full-bodied	2,69	1,086	,18	-,748	3,33	1,033	-,269	-,934
Alcoholic	3,45	,783	,038	-,309	3,37	,871	,125	-,581
Pleasant	3,1	,985	-,072	-,038	3,1	1,1	-,107	-,599
Appreciation	3,1	,964	,076	-,191	3,22	1,119	-,357	-,657
Attitude								
Wine perception 1	2,78	,963	,329	-,301	3,12	1,118	-,154	-1,046
Wine perception 2	2,84	1,067	-,089	-,652	3,04	1,124	-,171	-1,066
Wine perception 3	2,9	,928	-,286	-,136	3,06	,965	-,587	-,807
Wine perception 4	2,82	,993	-,146	-,613	3,1	1,035	-,437	-,561
Intention to buy 1	2,63	1,055	,023	-,797	2,86	1,229	-,272	-1,202
Intention to buy 2	2,69	1,122	,367	-,695	2,92	1,243	-,242	-1,161
Intention to buy 3	2,65	1,128	,373	-,628	2,92	1,192	-,291	-1,141
Positioning 1	2,73	1,076	,246	-,407	3,1	,974	-,207	-,739
Positioning 2	2,63	1,035	,099	-,747	3,04	,925	-,404	-1,05
Positioning 3	3,04	1,098	-,083	-,696	3,15	,875	-,692	-,373
Price perception	€6,58	4,477	1,501	2,323	€7,98	5,943	1,967	4,946
WTP	€6,71	4,786	1,363	3,152	€8,04	5,722	1,214	1,739

(Source: SPSS)

According the conceptual model developed, this study tested the research hypotheses that the sensory elements of the wine (i.e., sight - H1; smell - H2; and taste - H3) positively influence consumer

attitude towards the wine, specifically wine perception (a); intention to buy the wine (b); wine positioning (c), price perception of the wine (d); and willingness to pay for the wine (e). Table 5.4 provides a synthesis about the hypotheses' decisions based on the finding of this research:

Table 5.4 Hypotheses acceptance/Discard

Sensory perception of wine	Attitude	Hypothesis	Accepted/ Discarded
H1	a)	Sight positively influences consumer perception of the wine.	☑
	b)	Sight positively influences consumer intention to buy the wine.	☑
	c)	Sight positively influences wine positioning.	☑
	d)	Sight positively influences price perception of the wine.	☑
	e)	Sight positively influences consumer Willingness to Pay for the wine.	☒
H2	a)	Smell positively influences consumer perception of the wine.	☒
	b)	Smell positively influences consumer intention to buy the wine.	☑
	c)	Smell positively influences wine positioning.	☒
	d)	Smell positively influences price perception of the wine.	☒
	e)	Smell positively influences consumer Willingness to Pay for the wine.	☒
H3	a)	Taste positively influences consumer perception of the wine.	☑
	b)	Taste positively influences consumer intention to buy the wine.	☑
	c)	Taste positively influences wine positioning.	☑
	d)	Taste positively influences price perception of the wine.	☒
	e)	Taste positively influences consumer Willingness to Pay for the wine.	☑

(Source: Researchers' own elaboration)

6. DISCUSSION

The aim of the present investigation was to analyse the impact of the visual, olfactory and taste sensory inputs, which are the main senses in a wine tasting experience, on consumers' attitude towards red wines. For that purpose, a field sensory experience of wine tasting was done. Based on the information provided by Wine & Spirit Education Trust (2018), to evaluate sight perception, we considered colour intensity, fluidity, brightness and effervescence and the level of appreciation of each of these elements in wine appearance perception; for smell we measured intensity, fruitiness, florality, woodiness, pleasantness and appreciation; taste has been evaluated through the characteristics of intensity, sweetness, acidity, fruitiness, body, alcohol, pleasantness and appreciation. Then the objectives were two-fold: to assess if these senses influence consumer experience of wine consumption; and to understand which of the senses have more impact on consumers' attitude towards the wine. To study the attitude towards the wine, we analysed wine perception, intention to buy the wine, wine positioning, wine price perception and WTP for the wine.

The results of this research reveal that, in an integrated experience of wine consumption, that is the typical situation in a normal tasting experience, overall, the sense that mainly influences consumer's attitude toward the wine is, still, taste. Previous research showed that taste is the main sense that influences consumer's decision making (Thach & Olsen, 2006, p. 313; Bruwer, Saliba, & Miller, 2011, p. 7; Keown & Casey, 1995, p. 17; Camillo, 2012, p. 80, 84; Goodman, 2009, p. 42; Chaney, 2000, p. 8; International Food Information Council, 2011). In addition, research on the role of taste in wine consumption depicted that taste was the "single most influential driver of wine consumption and also of wine choice" (MacDonald, Saliba, & Bruwer, 2013, p. 355). Another study showed that the taste phenotype appears to have an impact in wine liking, emphasising the importance of taste in wine consumption (Pickering & Hayes, 2017, pp. 154, 160). Imran Rahmana and Dennis Reynolds (2015, p. 7) defend, though, that the importance of taste for a wine consumer is higher when the consumer presents a lower involvement with wine, that said, a more involved consumer should give more importance to appearance and smell. The present investigation emphasises the importance of taste in wine consumption, however, as the sensory input has been deconstructed as an assembly of intensity, sweetness, acidity, fruitiness, woodiness, body, alcohol, pleasantness and general appreciation, it led to new conclusions to add to the previous researches: in an integrated experience, the element of taste that is the most responsible for its perception is the body, followed by appreciation and pleasantness.

Further, this research also showed that sight is still a very important sense in a wine experience, which should be strategically managed by the production and marketing professionals. Previous contributions assessing the role of sight focused mainly on the label and the bottle (Laeng, Suegami, & Aminihajibashi, 2016, p. 329), not evaluating the impact of the visual cues of wine itself. In studies that considered the appearance of the wine - the content of the bottle/glass - only considered its colour (Spence & Piqueras-Fiszman, 2014, pp. 196-199), ignoring the other sensory elements that can be assessed and that are considered in a professional drinking experience (Wine & Spirit Education Trust, 2018). This research advances on the separation of sight into its components – the perception of colour intensity, fluidity, brightness, effervescence and the respective level of appreciation of the perceived characteristics – and the findings on which of these elements have the most impact on this sense's perception: this investigation concludes that these elements are effervescence, appreciation of brightness, colour intensity perception, and effervescence appreciation - for this last one, we concluded that consumers have a better perception of the appearance of wine when it is less effervescent, which means that generally people don't like when the wine is too effervescent.

In addition, smell, however, appears to be the sense with the least impact on consumer attitude towards the wine, from the three senses studied. Nevertheless, when each sense was assessed in a single way, the results show that smell have also a significant impact in consumers' attitude towards the wine. This finding advances previous studies that emphasize taste and smell as major influencers of consumer decision making over vision (Swieger, Chambers, & Pretorius, 2005, p. 109). Further, this research unfolded the sense of smell into its components – intensity, fruitiness, florality, woodiness, pleasantness and appreciation. This study indicates that the elements of smell that most influence the wine consumption experience are fruitiness, appreciation and pleasantness.

The present investigation is innovative as it focuses on the three main senses used in a wine drinking experience, studying two red wines and considering the different inputs provided by these key senses - not considering only the wine colour nor smell and taste overall. Also, we were able to link the senses to the consumer's attitude towards the wine and concluded that while sight does not affect WTP for the wine, it does affect customer perception of the wine, intention to buy the wine, positioning of the wine, and price perception of the wine; Taste appears to have an impact on consumer perception of the wine, intention to buy the wine, wine positioning, price perception of the wine, and WTP for the wine but does not appear to have an impact on price perception. Smell only seems to have an impact on consumer intention to buy the wine. These findings contribute to advancing current knowledge on the comprehension of how the three more required senses in a wine consumption experience – taste, sight

and smell – are perceived by the consumer and how these senses impact the consumer's attitude toward the wine.

7. CONCLUSIONS, AND THEORETICAL AND PRACTICAL IMPLICATIONS

This master's thesis examined the role of sensory marketing on wine customer decision making. The study sought to close a research gap and offer insight on the value of sensory components in the wine business by examining the influence of visual, olfactory, and taste inputs on consumers' perceptions regarding red wines.

Wine producers struggle to distinguish out and effectively connect with customers as the global wine industry changes and grows more crowded, with consumers harder to please (Dodd, Laverie, Wilcox, & Duhan, 2005, p. 9; Galati, Crescimanno, Tinervia, & Fagnani, 2017, p. 41; Pucci, Casprini, Nosi, & Zanni, 2019, p. 41) A useful strategy in this situation is sensory marketing, which stresses the use of sensory inputs to sway customer emotions and behaviours (Rodrigues, 2015, p. 69).

Red wines with different visual, smell, and taste qualities were used in the research's sensory experience of wine tasting. According to the study's findings, taste continues to be the top factor influencing consumers' decision making about wine, as supported by previous research (Thach & Olsen, 2006, p. 313; Bruwer, Saliba, & Miller, 2011; Keown & Casey, 1995; Camillo, 2012; Goodman, 2009; Chaney, 2000; MacDonald, Saliba, & Bruwer, 2013, p. 7; International Food Information Council, 2011). However, sight also had a significant impact, refuting the idea that visual signals in wine consumption should be undervalued. In contrast, smell had the least impact on customer opinions. This investigation shows that sight influences consumer’s perception of the wine, intention to buy the wine, wine positioning and price perception of the wine, but does not influence WTP for the wine; smell, apparently only influences consumer’s intention to buy the wine, not influencing consumer’s perception of the wine, wine positioning and price perception of the wine, nor WTP for the wine; taste has an impact in consumer’s perception of the wine, intention to buy the wine, wine positioning and WTP for the wine, not revealing an impact on price perception.

It's essential to comprehend client preferences in order to match wine qualities to their expectations while developing marketing tactics (Nadanyiova, Kliestikova, & Kolencik, 2018, p. 103). While taste prevails the most important sense, visual signals shouldn't be disregarded. Producers may better adapt to consumer demands and expectations by carefully employing sensory inputs, which will improve the experience of drinking wine overall (Nadanyiova, Kliestikova, & Kolencik, 2018, p. 96). The results of this study can help wine producers, providing insights into the elements that must be taken into account at various stages of wine production in order to succeed in a crowded market (Nadanyiova, Kliestikova, & Kolencik, 2018, p. 103).

Additional consumer decision making and sensory marketing research will be necessary to stay up with shifting customer tastes and expectations as the wine market continues to develop.

The current study has advanced our understanding of how consumers make decisions about drinking wine and may give producers of wine important new information for developing appealing and distinctive goods in a saturated global market. This research provides valuable contributions to the academic investigation in the field as it starts by studying the sensory elements - that have, in previous research, been defined as the mainly claimed in a wine consumption experience - by isolating the different aspects of each of them. Thus, this investigation emphasizes that taste is the main responsible for wine consumers' attitude - and adds that it is followed by sight and, lastly, by smell – and complements by showing that their perception are, respectively and above all, influenced by the body, effervescence and fruitiness.

Hence, the findings of this study provide relevant insights for the professionals of the wine sector because wine sensory inputs can be intentionally generated through wine-making procedures. Furthermore, these sensory inputs may allow to influence the consumer and generate the desired decision making.

8. LIMITATIONS AND RECOMMENDATIONS FOR FURTHER WORK

This study presents three limitations that might bias our findings. The first limitation is the low number of participants of the field experiment, which could have been carried out with more research product and more time to do the experiment. The second limitation concerns the generalizability of the findings of this study due to the fact that the study sample was largely limited to the people that were informed of the event and could attend it, who might not be representative of the general population in the world as it is mainly constituted by Portuguese people living in Braga. The third one is the fact that the two wines are not from the same country, so the sample of the study was not very familiar with the sensory inputs of the New Zealand wine, which can introduce cultural bias in the evaluations.

For future work on the topic, it is recommended to repeat the experiment with more participants, from different nationalities and with different cultural backgrounds. Another recommendation is to perform the experiment with wines from the same region. Also, it could be relevant to go in depth on fluidity analysis, and to evaluate whether fluidity is a visual cue, or, in fact, a taste or tactile one. Finally, sensory measurement can benefit from the use of recent technological devices and a more biometric assessment of the senses.

9. BIBLIOGRAPHY

Abdullahi Hassan Gorondutse, H. H. (2014). Effect of Business Social Responsibility (BSR) on Performance of SMEs: Data Screening and Preliminary Analysis. *Asian Social Science, 10*(8), 109.

Achrol, R. S., & Kotler, P. (2012). Frontiers of the marketing paradigm in the third millennium. *Journal of the Academy of Marketing Science, 40*(1), pp. 35-52.

Afonso, D. A. (2016). *Marketing Sensorial Cheiro cor e palhinhas: influência no sabor.* Covilhã.

Afonso, J. (2013). *Curso de Vinho para Verdadeiros Apreciadores.* A esfera dos livros.

Aguardente. (2023, May 16). Retrieved from Lexicon: https://glossary.wein.plus/aguardente

Agyekum, C. K., Haifeng, H., & Agyeiwaa, A. (2015). Consumer Perception of Product Quality. *Microeconomics and Macroeconomics, 3*(2), pp. 25-29.

Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior.* New Jersey: Prentice-Hall.

Alhaddad, A. (2015). Perceived Quality, Brand Image and Brand Trust as Determinants of Brand Loyalty. *Journal of Research in Business and Management, 3*(4), pp. 1-8.

Almeida, J. N. (2017). *Competitividade e Estratégia de Internacionalização dos Vinhos Portugueses.* Instituto Superior Técnico de Lisboa. Retrieved from https://fenix.tecnico.ulisboa.pt/cursos/megi/dissertacao/1691203502342816

American Psychological Association. (2023, May 2). *Intention*. Retrieved from APA Dictionary of Psychology: https://dictionary.apa.org/intention

Angela. (2017, May 3). *The Difference You Need To Know Between Tannin And Acid*. Retrieved from Yao Family Wines: https://yaofamilywines.com/the-difference-you-need-to-know-between-tannin-and-acid/

Argyriou, E., & Melewar, T. (2011). Consumer Attitudes Revisited: A Review of Attitude Theory in Marketing Research. *International Journal of Management Reviews, 13*(4), pp. 431-451.

Bagozzi, R. P., Baumgartner, J., & Yi, Y. (1989). An Investigation Into The Role Of Intentions as Mediators Of The Attitude-behavior Relationship. *Journal of Economic Psychology, 10*(1), 35-62.

Balasingh, J. R., Israel, D., Sudhahar, J. C., & Japhynth, J. (2007). Involvement Measurement Models- A Retro Analysis. *Bi-annual Publication of Society For Advanced Management Studies, 2*(2), pp. 10-17.

Banks, G., & Overton, J. (2010). Old World, New World, Third World? Reconceptualising the Worlds of Wine. *Journal of Wine Research, 21*(1), pp. 37-41.

Birse, M. J. (2007). *The colour of red wine.* University of Adelaide , Faculty of Sciences, Adelaide.

Brata, A., Chiciudean, D., Brata, V., Popa, D., Chiciudean , G., & Muresan, I. (2022). Determinants of Choice and Wine Consumption Behaviour: A Comparative Analysis between Two Counties of Romania. *Foods, 11*(8), pp. 2-15.

Bruwer, J., Saliba, A., & Miller, B. (2011). Consumer behaviour and sensory preference differences: implications for wine product marketing. *Journal of Consumer Marketing, 28*(1), 5-18.

Cabrita, M. (2006). *Apontamentos de enologia.* Universidade de Évora.

Camillo, A. (2012). A strategic investigation of the determinants of wine consumption in China. *International Journal of Wine Business Research, 24*(1), 5-21.

Casales-Garcia, i., Gonzalez-Abril, L., Veflen, N., & Velasco, C. (2023). Assessing the influence of colour and glass type on beer expectations. *Food Quality and Preference, 103*, 1-12.

Cavanova. (2019, May 31). *The taste of wine depends on its temperature*. Retrieved from Cavanova: https://cavanova.com/en/the-taste-of-the-wine-depends-on-its-temperature/

Chaney, I. (2000). External search effort for wine. *International Journal of Wine Marketing, 12*(2), 5-21.

Charters, S., & Pettigrew, S. (2005). Is wine consumption an aesthetic experience? *Journal of Wine Research, 16*(2), pp. 37-52.

Cocolin, L., & Ercolini, D. (2008). *Molecular Techniques in the Microbial Ecology of Fermented Foods.* Springer.

Correia, C. (2013). *Vinhos de Portugal – Degustar, Adequar e Servir.* Lisboa: Mil Segredos de Portugal.

Danner, L., Ristic, R., Johnson, T. E., Meiselman, H. L., Hoek, A. C., Jeffery, D. W., & Bastian, S. E. (2016). Context and wine quality effects on consumers' mood, emotions, liking and willingness to pay for Australian Shiraz wines. *Food Research International, 89*(1), 254-265.

Darias-Martín, J., Díaz-González, D., & Díaz-Romero, C. (2004). Influence of two pressing processes on the quality of must in white wine production. *Journal of Food Engineering, 63*(3), pp. 335-340.

De Langhe, B., Fernbach, P. M., & Lichtenstein, D. R. (2016). "Navigating by the Stars: Investigating the Actual and Perceived Validity of Online User Ratings. *Journal of Consumer Research, 42*(6), 817-833.

Di Stefano, R., Bosso, A., Panero, L., & Follis, R. (2003). Nouvelles techniques de vinification dans les vins rouges. *Revue Internet Technique du Vin*(1), pp. 1-10.

Dodd, T., Laverie, D., Wilcox, J., & Duhan, D. (2005). Differential effects of experience, subjective knowledge, and objective knowledge on sources of information used in consumer. *Journal of Hospitality and Tourism Research, 29*(1), pp. 3-19.

Erenkol, A. D., & Merve, A. (2015). Sensory Marketing. *Journal of Administrative Sciences and Policy Studies, 3*(1), pp. 1-26.

Festa, G., Cuomo, M. T., Metallo, G., & Festa, A. (2016, May 5). The (r)evolution of wine marketing mix: From the 4Ps to the 4Es. *Journal of Business Research, 69*(5), pp. 1550-1555.

Fischer, U., Boulton, R. B., & Noble, A. C. (1994). Physiological factors contributing to the variability of sensory assessments: Relationship between salivary flow rate and temporal perception of gustatory stimuli. *Food Quality and Preference, 4*(1-2), pp. 55-64.

Fontoin, H., Saucier, C., Teissedre, P. L., & Glories, Y. (2008). Effect of pH, ethanol and acidity on astringency and bitterness of grape seed tannin oligomers in model wine solution. *Food Quality and Preference, 19*(3), pp. 286-291.

Fornell, C., & Bookstein, F. (1982). Two structural equation models: LISREL and PLS applied to consumer exit-voice theory. *Journal of Marketing Research, 19*(4), 440-452.

Fornell, C., & Larcker, D. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research, 18*(1), pp. 39-50.

Francis, I., & Williamson, P. (2015). Application of consumer sensory science in wine research. *Australian Journal of Grape and Wine Research, 21*, pp. 554-567.

Frost, S. C., Harbertson, J., & Heymanna, H. (2017). A full factorial study on the effect of tannins, acidity, and ethanol on temporal perception of taste and mouthfeel in red wine. *Food Quality and Preference, 62*, pp. 1-7.

Galati, A., Crescimanno, M., Tinervia, S., & Fagnani, F. (2017). Social media as a strategic marketing tool in the Sicilian wine industry: evidence from Facebook. *Wine Economics and Policy, 6*(1), pp. 40-47.

Gawel, R. (1998). Red wine astringency: a review. *Australian Journal of Grape and Wine Research, 4*(2), pp. 74-95.

Gawel, R., Van Sluyter, S. C., Smith, P. A., & Waters, E. J. (2013). Effect of pH and alcohol on perception of phenolic character in white wine. *American Journal of Enology and Viticulture, 64*(4), pp. 425-429.

Gilby, C. (2020, june 22). *Winemaking: The importance of the soil*. Retrieved from The Wine Society: https://www.thewinesociety.com/discover/explore/expertise/winemaking-the-importance-of-the-soil

Goncharuk, A. G., & Habil. (2017). Wine Value Chains: Challenges And Prospects. *Journal of Applied Management and Investments, 6*(1), pp. 11-27.

Goode, J. (2012, July 12). *The Visual Assessment of Wine*. Retrieved from GuildSomm: https://www.guildsomm.com/public_content/features/articles/b/jamie_goode/posts/the-visual-assessment-of-wine

Goode, J. (2018). *Flawless: Understanding Faults in Wine.* California: University of California Press.

Goodman, S. (2009). An international comparison of retail consumer wine choice. *International Journal of Wine Business Research, 21*(1), 41-49.

Grainger, K., & Tattersall, H. (2005). *Wine Production Vine to Bottle.* Oxford: Blackwell Publishing Ltd.

Grover, R., & Vriens, M. (2006). *The Handbook of Marketing Research: Uses, Misuses, and Future Advances.* United States of America: SAGE Publications.

Guerrini, L., Corti, F., Angeloni, G., Masella, P., Spadi, A., Calamai, L., & Parenti, A. (2022). The Effects of Destemming/Crushing and Pressing Conditions in Rosé Wine Production. *Australian Society of Viticulture and Oenology, 2022*, pp. 1-14.

Habel, J., Schons, L. M., Alavi, S., & Wieseke, J. (2016). Warm Glow or Extra Charge? The Ambivalent Effect of Corporate Social Responsibility Activities on Customers' Perceived Price Fairness. *Journal of Marketing, 80*(1), 84-105.

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a Silver Bullet. *Journal of Marketing Theory and Practice, 19*(2), 139-151.

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review, 31*(1), 2-24.

Hair, J., Hult, G., Ringle, C., Sarstedt, M., & Thiele, K. (2017). Mirror, Mirror on the wall: a comparative evaluation of composite-based structural equation modeling methods. *Journal of the Academy of Marketing Science, 45*(5), 616-632.

Hall, C. M., & Mitchell, R. (2010). *Wine Marketing a practical guide.* Massachusetts: Elsevier.

Henseler, J., Ringle, C. M., & Sinkovic, R. R. (2009). The Use of Partial Least Squares Path Modeling in International Marketing. *Advances in International Marketing, 20*, pp. 277-319.

Hollebeek, L. D., Jaeger, S. R., Brodie, R. J., & Balemi, A. (2007). The influence of involvement on purchase intention for new world wine. *Food Quality and Preference, 18*(8), pp. 1033-1049.

Hoyle, B. (2017). Red or white, drinking wine is an ideal workout for the grey matter. *The Times*. Retrieved from https://www.thetimes.co.uk/article/red-or-white-drinking-wine-is-an-ideal-workout-for-the-grey-matter-vl03z9j0f

Hughson, A., Ashman, H., De La Huerga, V., & Moskowitz, H. (2007). Mind-sets of the wine consumer. *Journal of Sensory Studies, 19*(2), 85-105.

Hult, T. M., Morgeson, F. V., Morgan, N. A., Mithas, S., & Fornell, C. (2017). Do Managers Know What Their Customers Think and Why? *Journal of the Academy of Marketing Science, 45*(1), 37-43.

Hung, Y., & Verbeke, W. (2018). Sensory attributes shaping consumers' willingness-to-pay for newly developed processed meat products with natural compounds and a reduced level of nitrite. *Food Quality and Preference, 70*, 21-31.

Hussain, S. (2018). Brand Image and Customer Loyalty Through Sensory Marketing Strategies - A Study on International Fast Food Chain Restaurants. *International Journal of Management Studies, 2*(7), pp. 32-39.

INE. (2023, 01 05). *Consumo humano de vinho per capita (l/ hab.).* Retrieved from INE: https://www.ine.pt/xportal/xmain?xpid=INE&xpgid=ine_indicadores&indOcorrCod=0000178&contexto=bd&selTab=tab2

Instituto do Vinho e da Vinha. (2022). *Evolução da Produção Nacional de Vinho por Região Vitivinícola.* Retrieved from Instituto do Vinho e da Vinha: https://www.ivv.gov.pt/np4/163.html

Instituto do Vinho e da Vinha. (2022). *Exportação / Expedição de Vinhos - Novembro 2022.* Retrieved from Instituto do Vinho e da Vinha: https://www.ivv.gov.pt/np4/10162.html

International Food Information Council. (2011). Food & health survey: consumer attitudes towards food safety, nutrition & health. *International Food Information Council*.

Jacob, D., & Neal, J. (2011). Efficacy of preservation methods used for wine by the glass programs in restaurants. *Journal ofCulinary Science and Technology, 9*(4), pp. 212-227.

Jaeger, S., Danaher, P., & Brodie, R. (2010). Consumption decisions made in restaurants: the case of wine selection. *Food Quality and Preference, 21*(4), pp. 439-442.

Joshi, V., & Kumar, V. (2011). Importance, Nutritive Value, Role, Present Status and Future Strategies in Fruit Wines in India. *Bio-Processing of Food*, pp. 39-62.

Jover, A. J., Montes, F. J., & Fuentes, M. d. (2004). Measuring perceptions of quality in food products: the case of red wine. *Food Quality and Preference, 15*, pp. 453-469.

Kalyanaram, G., & Winer, R. S. (1995). Empirical Generalizations from Reference Price Research. *Marketing Science, 14*(3), pp. 161-169.

Kennedy, J. A., Ferrier, J., Harbertson, J. F., & Gachons, C. P. (2006). Analysis of Tannins in Red Wine Using Multiple Methods: Correlation with Perceived Astringency. *American Journal of Enology and Viticulture, 57*(4), pp. 481-485.

Keown, C., & Casey, M. (1995). Purchasing behaviour in the Northern Ireland wine market. *British Food Journal, 97*(1), pp. 17-20.

Kothari, C. R. (2004). *Research Methodology Methods and Technics* (2 ed.). New Delhi: New Age International Publishers.

Kotler, P. (2000). *Marketing Management: The Millennium Edition* (Vol. 1). Upper Saddle River: Prentice Hall.

Kotler, P., & Keller, K. L. (2016). *Marketing Management* (15 ed.). New Jersey: Prentice Hall.

Kotler, P., Armstrong, G., Harris, L. C., & He, H. (2020). *Principles of Marketing.* London: Pearson.

Kotler, P., Armstrong, G., Saunders, J., & Wong, V. (2001). *Principles of marketing* (2 ed.). New Jersey: Prentice Hall.

Kraus, S. J. (1995). Attitudes and the prediction of behaviour: a meta-analysis of the empirical literature. *Personality and Social Psychology Bulletin, 21*(1), pp. 58-75.

La Placa, L., Tsitsigiannis, D., Camardo Leggieri, M., & Battilani, P. (2023). From Grapes to Wine: Impact of the Vinification Process on Ochratoxin A Contamination. *Foods 2023, 12*(2), pp. 1-16.

Laeng, B., Suegami, T., & Aminihajibashi, S. (2016). Wine labels: an eye-tracking and pupillometry study. *International Journal of Wine Business Research, 28*(4), 327-348.

Lance, C. E., & Michels, L. C. (2006). The Sources of Four Commonly Reported Cutoff Criteria: What Did They Really Say ? *Organizational Research Methods, 9*(2), 202-220.

Lehrer, K., & Lehrer, A. (2016). The language of taste. *Inquiry, 59*(6), pp. 752-765.

Lesschaeve, I. (2007). Sensory Evaluation of Wine and Commercial Realities: Review of Current Practices and Perspectives. *American Journal of Enology and Viticulture, 58*(2), pp. 252-258.

Lim, E. A., Lee, Y. H., & Foo, M.-D. (2017). Frontline Employees' Nonverbal Cues in Service Encounters: A Double-Edged Sword. *Journal of the Academy of Marketing Science, 45*(5), 657-676.

Linda F. Bisson, A. L. (2002). The present and future of the international wine industry. *Nature, 418*, 696-699.

Lintelle, P. (2014). Sensory Marketing Aspects: Priming, Expectations, Crossmodal Correspondences & More. *The Journal for Decision Makers, 41*(3), pp. 264-266.

Lockshin, L., Rasmussen, M., & Cleary, F. (2000). The nature and roles of a wine brand. *Australian and New Zealand Wine Industry Journal – The First International Wine Marketing Supplement, 4*, pp. 17-24.

Lockshin, L., Wade, J., d'Hauteville, F., & Perrouty, J. (2006). Using simulations from discrete choice experiments to measure consumer sensitivity to brand, region, price, and awards in wine choice. *Food Quality and Preference, 3-4*, pp. 166-178.

Lusa. (2023). Douro é Cidade Europeia do Vinho 2023 e já tem iniciativas planeadas. *Diário de Notícias*. Retrieved 01 03, 2023, from https://www.dn.pt/local/douro-e-cidade-europeia-do-vinho-2023-e-ja-tem-iniciativas-planeadas-15588817.html

MacDonald, J. B., Saliba, A. J., & Bruwer, J. (2013). Wine choice and drivers of consumption explored in relation to generational cohorts and methodology. *Journal of Retailing and Consumer Services, 20*(3), 349-357.

Maizza, A., & Rosato, P. (2008). Wine tourism and enhanced value: a comparison between Italian successful destinations. *4th International Conference of the Academy of Wine Business Research*, (pp. 1-14). Siena.

Malhotra, N. N. (2017). *Marketing Research: An Applied Approach* (5 ed.). Edinburgh: Pearson.

Markin, R., & Narayana, C. (1975). Behaviour Control: Are Consumers Beyond Freedom and Dignity? (W. Wilkie, & A. Arbor, Eds.) *Advances in Consumer Research, 3*, pp. 191-196.

Maxham III, J. G., & Netemeyer, R. G. (2002). "Modeling Customer Perceptions of Complaint Handling Over Time: The Effect of Perceived Justice on Satisfaction and Intent. *Journal of Retailing, 78*(4), pp. 239-252.

Mierczynska-Vasilev, A., & Smith, P. (2015). Current state of knowledge and challenges in wine clarification. *Australian Society of Viticulture and Oenology, 21*(S1), pp. 615-626.

Morrot, G., Brochet, F., & Dubourdieu, D. (2001). The Color of Odors. *Brain and Language, 79*(2), pp. 1-11.

Myers, D. (1993). *Social Psychology* (10 ed.). New York: McGraw-Hill.

Nadanyiova, M., Kliestikova, J., & Kolencik, J. (2018). Sensory Marketing From The Perspective Of a Support Tool For Building Brand Value. *Economics And Culture, 15*(1), pp. 96-104.

Oude Ophuis, P. A., & van Trijp, H. C. (1995). Perceived quality: A market driven and consumer oriented approach. *Food Quality and Preference, 6*, pp. 177-183.

Parr, W. V., White, K. G., & Heatherbell, D. A. (2003). The Nose Knows: Influence of Colour on Perception of Wine Aroma. *Journal of Wine Research, 14*(2-3), pp. 79-101.

Penn Museum. (n.d.). *The Earliest Alcoholic Beverage In The World*. Retrieved from Penn Museum: https://www.penn.museum/research/project.php?pid=12

Per, & Karlsson, B. (2019). Does It Make Any Difference If Wine Is Aged In Stainless Steel, Concrete, Wood Or Egg Tank? *Forbes*. Retrieved from https://www.forbes.com/sites/karlsson/2019/11/19/difference-wine-aged-in-stainless-steel-concrete-wood-egg-tank/?sh=6863261b563a

Pereira, A. I. (2022). Portugal já exporta mais vinho para os EUA do que para França. *Público*. Retrieved 01 04, 2023, from https://www.publico.pt/2022/11/25/terroir/noticia/portugal-ja-exporta-vinho-eua-franca-2029204

Petit, O., Cheok, A. D., Spence, C., Velasco, C., & Karunanayaka, K. T. (2015, 11 16). Sensory Marketing in Light of New Technologies. *In Proceedings of the 12th International Conference on Advances in Computer Entertainment Technology. 53*, pp. 1-4. New York: Association for Computing Machinery.

Petit, O., Velasco, C., Cheok, A. D., & Spence, C. (2015). Consumer Sensory Neuroscience in the Context of Food Marketing. *ACE '15: Proceedings of the 12th International Conference on Advances in Computer Entertainment Technology. 49*, pp. 1-4. New York: Association for Computing Machinery.

Pholvisrethkul, T. (2002). *A comparative study of consumer behavior and attitude towards Lancome and Shiseido.* Bangkok.

Pickering, G., & Hayes, J. (2017). Influence of biological, experiential and psychological factors in wine preference segmentation. *Australian Journal of Grape and Wine Research, 23*(2), 154-161.

Pinto, I. (2022). Exportações de vinho a caminho de novo ano recorde. *Dinheiro Vivo*. Retrieved 04 01, 2023, from https://www.dinheirovivo.pt/economia/exportacoes-de-vinho-a-caminho-de-novo-ano-recorde-15336926.html

Posteraro, F. (2021, March 14). *What is a Complex wine?* Retrieved from Finding.wine: https://finding.wine/blogs/blog-posts/what-is-a-complex-wine#:~:text=A%20complex%20wine%20is%20defined,various%20parts%20inside%20our%20mouth.

Pucci, T., Casprini, E., Nosi, C., & Zanni, L. (2019). Does social media usage affect online purchasing intention for wine? The moderating role of subjective and objective knowledge. *British Food Journal, 121*(2), 275-288.

Puckette, M. (n.d.). *Secrets Behind the Color Pigment in Red Wine*. Retrieved February 25, 2023, from Wine Folly: https://winefolly.com/deep-dive/know-a-wine-just-by-looking-at-the-color/

Puckette, M. (n.d.). *Tips on Tasting: Wine Bouquet vs Aroma*. Retrieved from Wine Folly: https://winefolly.com/tips/tips-on-tasting-wine-bouquet-vs-aroma/

Rahmana, I., & Reynolds, D. (2015). Wine: Intrinsic attributes and consumers' drinking frequency, experience, and involvement. *International Journal of Hospitality Management, 44*, 1-11.

Rapp, A. M. (1986). Wine aroma. *Experientia, 42*(1), pp. 873-884.

Reeves, C. A., & Bednar, D. A. (1994). Defining quality: Alternatives and implications. *Academy of Management Review, 19*(3), pp. 419-455.

Rodrigues, F. (2015). *Princípios de Neuromarketing: Neurociência cognitiva aplicada ao consumo, espaço e design.* Viseu: Psicosoma.

Rothschild, M. (1984). Perspectives on Involvement: Current Problems and Future Directions. *Advances in Consumer Research, 11*, pp. 216-217.

Rupio, J. A. (2017). *Importância dos estímulos do marketing na apreciação de um vinho.* Évora.

Russan, A. (2019, August 28). *The Science of Color in Wine*. Retrieved February 26, 2023, from SevenFiftyDaily: https://daily.sevenfifty.com/the-science-of-color-in-wine/

Rust, R. T., Inman, J. J., Jia, J., & Zahorik, A. (1999). What you don't know about customer-perceived quality: The role of customer expectation distributions. *Marketing Science, 18*(1), pp. 77-92.

Sáenz-Navajas, M.-P., Avizcuri, J.-M., Ballester, J., Fernández-Zurbano, P., Ferreira, V., Peyron, D., & Valentin, D. (2015). Sensory-active compounds influencing wine experts´ and consumers´ perception of red wine intrinsic quality. *LWT - Food Science and Technology, 60*(1), 400-411.

Sanchez, G. (2013). *PLS path modeling with R .* Berkeley: Trowchez Editions.

Sarstedt, M., Ringle, C., & Hair, J. (2017). Partial least squares structural equation modeling. In M. R. Sarstedt, J. Hair, C. Homburg, M. Klarmann, & A. Vomberg (Eds.), *Handbook of Market Research.* Springer, Heidelberg.

Sarstedt, M., Ringle, C., & Hair, J. F. (2020). Partial Least Squares Structural Equation Modeling. In C. Homburg, M. Klarmann, & A. Vomberg, *Handbook of Market Research.* Springer.

Schuster, M. (2002). *Essential Winetasting.* London: Mitchell Beazley.

Shannon B. Rinaldo, D. F. (2014). Evaluating tastes and aromas of wine: a peek inside the "black box". *International Journal of Wine Business Research, 26*(3), 208-223.

Sharma, B. (2015). "Viticulture and Vinification" Two Fundamentals in Promotion of Wine Tourism In India. *IJLTEMAS, 4*, pp. 1-5.

Shoemaker, J. (s.d.). *Your Best Crush and Press.* Retrieved from Wine Maker: https://winemakermag.com/article/crush-press-2

Smith, B. C. (2019). Getting More Out of Wine: wine experts, wine apps and sensory science. *Current Opinion in Food Science, 27*, pp. 123-129.

Smith, P. (2017). *Factors affecting wine texture, taste, clarity, stability and production efficiency.* Adelaide: The Australian Wine Research Institute.

Spawton, A. (1991). Of wines and live asses: An introduction to the wine economy and state of wine marketing. *European Journal of Marketing, 3*, pp. 6-48.

Spence, C. (2020). Wine psychology: basic & applied. *Cognitive Research: Principles and Implications, 5*(22).

Spence, C., & Piqueras-Fiszman, B. (2014). *The Perfect Meal: The Multisensory Science of Food and Dining.* Chichester, Oxford, and Hoboken: Wiley Blackwell.

Spence, C., Motoki, K., & Petit, O. (2022). Factors influencing the visual deliciousness / eye-appeal of food. *Food Quality and Preference, 102*, pp. 1-16.

Statista Research Department. (2022, 09 01). *Principaux pays exportateurs de vin dans le monde en 2021, en fonction du volume.* Retrieved from Statista: https://fr.statista.com/statistiques/491370/exportateurs-vin-monde/

Steenkamp, J., & M., B. E. (1990). Conceptual model of the quality perception process. *Journal of Business Research, 21*(4), pp. 309-333.

Sullivan, S. P. (2020, August 20). *Everything You Ever Wanted to Know About Cork Taint*. Retrieved from WineEnthusiast: https://www.winemag.com/2020/08/20/cork-taint-wine-fault-guide/

Swieger, J., Chambers, P., & Pretorius, I. (2005, July). Olfaction and taste: Human perception, physiology and genetics. *Australian Journal of Grape and Wine Research, 11*(2), pp. 109-113.

Thach, E., & Olsen, J. (2006). Market segment analysis to target young adult wine drinkers. *Agribusiness, 22*(3), pp. 307-322.

Thaler, R. (1985). Mental Accounting and Consumer Choice. *Marketing Science, 4*(3), 199-214.

Thanh, T., & Kirova, V. (2018). Wine tourism experience: a netnography study. *Journal of Business Research, 83*(C), pp. 30-37.

Tiu Wright, L., Nancarrow, C., & Kwok, P. (2001). Food taste preferences and cultural influences on consumption. *British Food Journal, 103*(5), pp. 348-357.

Trudel, R., Argo, J. J., & Meng, M. D. (2016). The Recycled Self: Consumers' Disposal Decisions of Identity-Linked Products. *Journal of Consumer Research, 43*(2), 246-264.

Velasco, C., Carvalho, F. R., Petit, O., & Nijholt, A. (2016). A Multisensory Approach for the Design of Food and Drink. (7), pp. 1-7.

Vidal, S., Francis, L., Guyot, S., Marnet, N., Kwiatkowski, M., Gawel, R., . . . Waters, E. (2003). The mouth-feel properties of grape and apple proanthocyanidins in a wine-like medium. *Journal of the Science of Food and Agriculture, 83*(6), pp. 564-573.

Vinho Verde. (n.d.). *The story goes that the wines of Vinho Verde*. Retrieved from Vinho Verde: https://www.vinhoverde.pt/en/history-of-vinho-verde

Vinzi, V. E., Trinchera, L., & Amato, S. (2010). PLS path modeling: from foundations to recent developments and open issues for model assessment and improvement. In V. Vinzi, W. Chin, J. Henseler, H. Wang, V. E. Vinzi, W. W. Chin, J. Henseler, & H. Wang (Eds.), *Handbook of Partial Least Squares: Concepts, Methods, and Applications.* Heidelberg: Springer.

Wagner, P., Olsen, J., & Thach, L. (2011). *Wine Marketing & Sales: Success Strategies for a Saturated Market* (2 ed.). São Francisco: Board and Bench Publishing.

Wearing, P. (2019, April 22). *Tannins explained: A guide to tannins in wine*. Retrieved from The Small WineMakers Collection: https://www.smallwinemakers.ca/wine-tannins/#:~:text=Describing%20Wine%20Tannins%20During%20A%20Tasting&text=For%20example%2C%20tannins%20that%20are,have%20no%20trace%20of%20bitterness.

White, K., Lin, L., Dahl, D. W., & Ritchie, R. J. (2016). When Do Consumers Avoid Imperfections? Superficial Packaging Damage as a Contamination Cue. *Journal of Marketing Research, 53*(1), 110-123.

Willaby, H., Costa, D., Burns, B., MacCann, C., & Roberts, R. (2015). Testing complex models with small sample sizes: a historical overview and empirical demonstration of what partial least squares (PLS) can offer differential psychology. *Personality and Individual Differences, 84*, 73-78.

Wine & Spirit Education Trust. (2018, August). WSET® Level 4 Diploma in Wines and Spirits: Candidate Assessment Guide Part 2: Tasting. London.

Wine Folly. (n.d.). *The Wine Color Chart*. Retrieved 12 19, 2022, from Wine Folly: https://winefolly.com/tips/wine-color-chart/

Wine Spectator. (n.d.). *Glossary*. Retrieved February 25, 2023, from Wine Spectator: https://www.winespectator.com/glossary/show/id/clarity

Wold, H. (1982). Soft modeling: the basic design and some extensions. In K. Joreskog, H. Wold, K. Jöreskog, & H. Wold (Eds.), *Systems under Indirect Observations: Part II* (Vol. II, pp. 1-54). Amsterdam: North-Holland.

Wolter, J. S., & Cronin Jr., J. J. (2016). Re-Conceptualizing Cognitive and Affective Customer–Company Identification: The Role of Self-Motives and Different Customer-Based Outcomes. *Journal of the Academy of Marketing Science, 44*(3), 397-413.

Yim, C., & Kannan, P. (1999). Consumer behavioral loyalty. *Journal of Business Research, 44*(2), pp. 75-92.

ANNEXES

ANNEX A. TECHNICAL FILE OF THE WINE "FRAMINGHAM MARLBOROUGH PINOT NOIR 2020".



SOURCE

REGION
Marlborough

SUB REGIONS
Conders Bend, Southern Valleys, Waihopai

VINEYARDS
Dry Hills, West View, Lawrence, Eversley

VINE AGE
Up to 20 years old

SOIL TYPE
Mostly Clay

ANALYSIS

ACID
6.0 g/l

pH
3.7

ALC
13.5% vol

RS
NIL

FRAMINGHAM

Marlborough Pinot Noir 2020

Framingham Pinot Noir leans towards a more savoury style displaying grace and charm with strong varietal character and structure to add interest.

WINEMAKING

Fruit comes from four sites in the Wairau Valley, with a mixture of clones being represented. Each parcel was hand – picked and vinified separately; the amount of whole bunch included and time on skins varied according to parcel. Overall, the wine has about 10% whole bunch content, an average of 20 days on skins and was aged in French oak barriques for 10 months, of which around 20% were new.

TASTE

Earthy nose, subtle oak, reminiscent of smoked meat, with light florals and vibrant red and blue fruits. Dark cherry and red berry flavors with savoury mineral/graphite-like notes. Fine, supple, well integrated tannin structure.

FOOD MATCH

Duck, lamb, charcuterie, smoked salmon.

ANNEX B. TECHNICAL FILE OF THE WINE "HERDADE DO PESO TRINCA BOLOTAS 2020".

HERDADE do PESO

HERDADE DO PESO TRINCA BOLOTAS RED 2020

TYPE: Still **COLOUR:** Red

DESIGNATION OF ORIGIN: DOC Alentejo **REGION:** Alentejo

COUNTRY OF ORIGIN: Portugal **SUSTAINABLE VITICULTURE:** Yes

THE WINE

Moving freely through the cork oak forests of the Alentejo, where it feeds on acorns among other things, the Alentejo pig, a species indigenous to Portugal, is Europe's only surviving pastoral pig. Due to the way in which it forms part of the landscape and preserves the region's Mediterranean forest, it is part of Alentejo's heritage. Named after this reputable pig, this wine combines two of Alentejo's biggest symbols.



TASTING NOTES

Intense ruby colour. This wine has an aroma of vibrant red fruit with floral notes, courtesy of the Touriga Nacional grape variety. On the palate, it is incredibly balanced with very smooth tannins and a refreshing acidity. An extremely gastronomic wine with a long finish.

HARVEST YEAR

2020 was characterised by a cold and relatively dry winter, a very rainy spring sometimes interrupted by very hot days. July was extremely hot and dry and August had slightly lower temperatures but cool nights, ideal for good maturation.

WINEMAKER: Luis Cabral de Almeida

VARIETIES: 44% Alicante Bouschet, 40% Touriga Nacional, 16% Aragonez

WINEMAKING

Vinified from selected batches of Alicante Bouschet, Touriga Nacional and Aragonez grapes. After destemming and soft-crushing, pre-fermentative maceration took place for 3-4 days to add further complexity. The wine fermented at 26ºC with gentle pumping-over to preserve the fruit and extract the smooth tannins that provide vital balance.

MATURATION

After malolactic fermentation, the wines aged for 6 months in stainless steel tanks. They were subject to light filtration prior to bottling.

STORE

This wine is ready for immediate consumption. However, if you wish to store it for some years, the bottle should be stored horizontally in a cool, dry place away from light.

SERVE

This wine should be served at 16ºC-18ºC.

ENJOY

With its smooth tannins and enormous balance, this wine pairs wonderfully with light dishes, such as poultry and pasta, as well as with sausages, ham and more sophisticated meat dishes.

TECHNICAL DETAILS

Alcohol: 14% ±0,5 |Total Acidity: 5,8 g/L (tartaric Acid) | Total Sugars: 1,4 g/L ±0,5 | pH: 3,7 ±0,5

NUTRITIONAL INFORMATION (TYPICAL VALUES FOR 100 mL)

Alcohol: 11,1 g | Sugars: 0,1 g | Energetic Value: 355 kJ/85 kcal | Suitable for Vegetarians: Yes | Suitable for Vegans: Yes | Gluten-Free

ALLERGENS:
Contains sulphites

BOTTLING DATE: 2021-11-16 **BOTTLES PRODUCED:** 1.050.000

AVAILABLE CAPACITIES: 3.000 mL, 1.500 mL, 750 mL

BOTTLER:
Bottled by: Sogrape Vinhos, S.A., Avintes, Portugal

INTEGRATED PRODUCTION

All the grapes used in this wine were produced in accordance with the Sustainable Agriculture Integrated Production guidelines as defined by the International Organisation for Biological and Integrated Control (OILB/IOBC): www.iobc-wprs.org/ip_ipm/IOBC_IP_principles.html. The rigorous compliance with these practices is certified by an independent organisation, recognized by the Portuguese State.

PART OF SOGRAPE
Sogrape Vinhos, S.A.
Rua 5 de Outubro, 4527, 4430-809 Avintes, Portugal
Phone: +351-227 838 104 Fax: +351-227 833 719
v1. 2021-11-17
Email: info@herdadedopeso.com
Website: www.herdadedopeso.pt

BE RESPONSIBLE. DRINK IN MODERATION.
WINE IN MODERATION CHOOSE | SHARE | CARE
wines of portugal

ANNEX C. QUESTIONNAIRE 1: OBSERVATION

Questionnaire Experience 1 – Observation

Regarding the appearance of the wine:

a. The **colour** of this wine is:

	1	2	3	4	5	
Not Intense	○	○	○	○	○	Very intense
I don't like the colour at all	○	○	○	○	○	I really like the colour

b. As for **fluidity**, this wine is:

	1	2	3	4	5	
Not fluid at all	○	○	○	○	○	Very fluid
I don't like fluidity at all	○	○	○	○	○	I really like the fluidity

c. As for **brightness**, this wine is:

	1	2	3	4	5	
Not bright	○	○	○	○	○	Very bright
I don't like the brightness at all	○	○	○	○	○	I really like the brightness

d. As for **effervescence**, this wine is:

	1	2	3	4	5	
Not effervescent at all	○	○	○	○	○	Very effervescent
I don't like the effervescence at all	○	○	○	○	○	I really like the effervescence

2. Indicate **your opinion** for each of the following statements:

	Strongly Disagree 1	2	3	4	Totally Agree 5
I like the look of this wine.	○	○	○	○	○
From this appearance, I have a desire to taste this wine.	○	○	○	○	○
For me, this wine has high quality.	○	○	○	○	○
I have high expectations for this wine.	○	○	○	○	○
In the next 3 months I intend to buy this wine.	○	○	○	○	○
I would buy this wine to give to a family member or friend.	○	○	○	○	○

I would recommend this wine to a family member or friend.	○	○	○	○	○

This wine will have a premium position.	○	○	○	○	○
This wine has a high price.	○	○	○	○	○
This wine has many sales.	○	○	○	○	○

How much do you think a 750mL bottle of this wine **costs?** A:_____ €	What is the **maximum amount you would be willing to pay** for a 750mL bottle of this wine? A:_____ €

ANNEX D. QUESTIONNAIRE 2: SMELL

Questionnaire Experience 2 – Smell

Regarding the smell of wine:

a. The **smell** of this wine is:

	1	2	3	4	5	
Not intense	○	○	○	○	○	Very intense
Not fruity	○	○	○	○	○	Very fruity
Not floral	○	○	○	○	○	Very floral
Not woody	○	○	○	○	○	Very woody
Not pleasant	○	○	○	○	○	Very nice
I don't like the smell at all	○	○	○	○	○	I really like the smell

2. Indicate **your opinion** for each of the following statements:

	Strongly Disagree 1	2	3	4	I totally agree 5
I like the smell of this wine.	○	○	○	○	○
From this smell, I want to taste this wine.	○	○	○	○	○
For me, this wine has high quality.	○	○	○	○	○
I have high expectations for this wine.	○	○	○	○	○
In the next 3 months I intend to buy this wine.	○	○	○	○	○
I would buy this wine to give to a family member or friend.	○	○	○	○	○
I would recommend this wine to a family member or friend.	○	○	○	○	○
This wine will have a premium position.	○	○	○	○	○
This wine has a high price.	○	○	○	○	○
This wine has many sales.	○	○	○	○	○

How much do you think a 750mL bottle of this wine **costs?**

A:_____ €

What is the **maximum amount you would be willing to pay** for a 750mL bottle of this wine?

A:_____ €

Questionnaire Experience 3 – Taste

1. Regarding the taste of the wine:

a. The **taste** of this wine is:

	1	2	3	4	5	
Not intense at all	○	○	○	○	○	Very intense
Not sweet at all	○	○	○	○	○	Very sweet
Not acidic at all	○	○	○	○	○	very acidic
Not fruity at all	○	○	○	○	○	very fruity
Not woody at all	○	○	○	○	○	very woody
Not full bodied	○	○	○	○	○	very full bodied
Not alcoholic	○	○	○	○	○	very alcoholic
Not pleasant	○	○	○	○	○	very nice
I don't like the taste at all	○	○	○	○	○	I really like the taste

2. Indicate **your opinion** for each of the following statements:

	Strongly Disagree 1	2	3	4	Totally Agree 5
I like the taste of this wine.	○	○	○	○	○
From this flavour, I want to taste this wine.	○	○	○	○	○
For me, this wine has high quality.	○	○	○	○	○
I have high expectations for this wine.	○	○	○	○	○
In the next 3 months I intend to buy this wine.	○	○	○	○	○
I would buy this wine to give to a family member or friend.	○	○	○	○	○
I would recommend this wine to a family member or friend.	○	○	○	○	○
This wine will have a premium position.	○	○	○	○	○
This wine has a high price.	○	○	○	○	○
This wine has many sales.	○	○	○	○	○

How much do you think a 750mL bottle of this wine **costs?**

A:_____ €

What is the **maximum amount you would be willing to pay** for a 750mL bottle of this wine?

A:_____ €

ANNEX F. QUESTIONNAIRE 4: INTEGRATED EXPERIENCE

Questionnaire Experience 4 – Wine tasting

a. The **colour** of this wine is:

	1	2	3	4	5	
Not Intense	○	○	○	○	○	Very intense
I don't like the colour at all	○	○	○	○	○	I really like the colour

b. As for **fluidity**, this wine is:

	1	2	3	4	5	
Not fluid	○	○	○	○	○	Very fluid
I don't like fluidity at all	○	○	○	○	○	I really like the fluidity

c. As for **brightness**, this wine is:

	1	2	3	4	5	
Not bright	○	○	○	○	○	Very bright
I don't like the brightness at all	○	○	○	○	○	I really like the brightness

d. As for **effervescence**, this wine is:

	1	2	3	4	5	
Not effervescent	○	○	○	○	○	Very effervescent
I don't like the effervescence at all	○	○	○	○	○	I really like the effervescence

e. The **smell** of this wine is:

	1	2	3	4	5	
Not intense	○	○	○	○	○	Very intense
Not fruity	○	○	○	○	○	Very fruity
Not floral	○	○	○	○	○	Very floral
Not woody	○	○	○	○	○	Very woody
Not pleasant	○	○	○	○	○	Very nice
I don't like the smell at all	○	○	○	○	○	I really like the smell

f. The **taste** of this wine is:

	1	2	3	4	5	
Not intense	○	○	○	○	○	Very intense
Not sweet	○	○	○	○	○	Very sweet
Not acidic	○	○	○	○	○	Very acidic
Not fruity	○	○	○	○	○	Very fruity
Not woody	○	○	○	○	○	Very woody
Not full bodied	○	○	○	○	○	Very full bodied
Not alcoholic	○	○	○	○	○	Very alcoholic
Not pleasant	○	○	○	○	○	Very nice
I don't like the taste at all	○	○	○	○	○	I really like the taste

2. Indicate **your opinion** for each of the following statements:

	Strongly Disagree 1	2	3	4	I totally agree 5
I like this wine.	○	○	○	○	○
From this experience, I want to consume more of this wine.	○	○	○	○	○
For me, this wine has high quality.	○	○	○	○	○
I have high expectations regarding the growth of this wine.	○	○	○	○	○
In the next 3 months I intend to buy this wine.	○	○	○	○	○
I would buy this wine to give to a family member or friend.	○	○	○	○	○
I would recommend this wine to a family member or friend.	○	○	○	○	○
This wine will have a premium position.	○	○	○	○	○
This wine has a high price.	○	○	○	○	○
This wine has many sales.	○	○	○	○	○

How much do you think a 750mL bottle of this wine **costs?**

A:_____ €

What is the **maximum amount you would be willing to pay** for a 750mL bottle of this wine?

A:_____ €

ANNEX G. QUESTIONNAIRE 5: SOCIODEMOGRAPHIC QUESTIONNAIRE

Brief questions about yourself:

1. Gender: Feminine ○0 / Masculine ○1

2. Age: _____

3. Literary abilities: (Highest degree completed)

4th grade	○1
6th grade	○2
9th grade	○3
High school	○4
Bachelor degree	○5
Master's degree	○6
PhD	○7

4. Marital status:

Single	○1
Married/De facto Union	○2
Divorced	○3
Widower	○4

5. District of residence: _____

6. Professional situation:

	○1
Employee	○2
Self-Employed Worker	○3
Retired/Pensioner	○4
Unemployed	○5

7. At what age did you start drinking alcohol? _____

8. On average, how often do you drink alcohol per week?

Never	○1
1 to 2 times a week	○2
3 to 5 times a week	○3
6 or more times a week	○4

9. At what age did you start drinking wine? _____

10. What is your favourite type of wine?

Verde White	○1	Rosé	○5
Verde Red	○2	I have no preference	○6
White	○3	I don't like wine	○7
Red	○4		

11. On average, how often do you drink wine per week?

Never	○1
1 to 2 times a week	○2
3 to 5 times a week	○3
6 or more times a week	○4

12. On average, how much wine do you consume per week?
(Note that a glass will be around 150mL and a 750mL bottle equals 5 glasses of wine.)

0 glasses	○1
1 to 4 glasses	○2
5 to 10 glasses	○3
11 to 20 glasses	○4
21 or more glasses	○5

13. Indicate how you evaluate the following characteristics regarding wine consumption:

	1	2	3	4	5	
Not appreciator	○	○	○	○	○	Very appreciator
Not familiar	○	○	○	○	○	Very familiar
Not informed	○	○	○	○	○	Very informed
Not expert	○	○	○	○	○	Very expert
Not at all familiar with the usual wine prices	○	○	○	○	○	Very familiar with the usual wine prices
I don't know what the appropriate price would be for a 750mL bottle of wine	○	○	○	○	○	I know what the appropriate price would be for a 750ml bottle of wine

14. How much are you willing to pay for a bottle of wine on a typical occasion? A: _____ €

15. How much are you willing to pay for a bottle of wine for a special occasion? A: _____ €

Thank you for your participation.

ANNEX H. ADVERTISING TEMPLATE OF THE EXPERIMENT[1]



[1] Translation from the authors:
"Sensory Experience
Wine Taste
within the framework of a master's research
1st of April 2023
D. Diogo de Sousa Museum
10h30 - 17h
Free"

Annex I. Descriptive statistic of the elements of the three first experiment phases

	Wine 1				Wine 2			
Item	**Mean**	**SD**	**Skewness**	**Kurtosis**	**Mean**	**SD**	**Skewness**	**Kurtosis**
Only Sight								
Colour 1	3,04	,916	- ,242	- ,654	4,20	,849	- ,598	- ,784
Colour 2	3,38	1,105	- ,345	- ,784	3,78	,815	- ,508	,043
Fluidity 1	3,78	,923	- ,659	,519	3,12	,887	- ,058	,043
Fluidity 2	3,43	1,061	- ,187	- ,372	3,34	,917	- ,414	,398
Brightness 1	3,55	1,006	- ,201	-1,003	3,39	,961	- ,314	- ,458
Brightness 2	3,67	1,008	- ,308	,340	3,52	,886	- ,704	1,216
Effervescence 1	1,78	,966	1,01	- ,037	1,94	1,047	,665	- ,891
Effervescence 2	2,73	1,204	,165	- ,706	2,67	1,191	,374	- ,403
Wine perception 1	3,45	,986	- ,249	- ,465	3,57	,913	- ,563	,253
Wine perception 2	3,63	1,166	- ,479	- ,706	3,63	1,019	- ,715	,254
Wine perception 3	3,12	1,092	- ,252	- ,605	3,26	,944	- ,251	,049
Wine perception 4	2,96	1,038	,081	- ,742	3,35	,855	- ,124	- ,729
Intention to buy 1	2,65	1,128	,227	- ,576	2,78	1,101	- ,02	- ,844
Intention to buy 2	2,86	1,077	- ,216	- ,623	3,16	1,017	- ,455	- ,122
Intention to buy 3	2,84	1,102	- ,05	- ,576	3,16	1,046	,001	- ,257
Positioning 1	2,84	1,076	,332	- ,891	3,00	,894	- ,349	- ,088
Positioning 2	2,84	,976	,197	- ,495	2,96	,781	- ,464	,027
Positioning 3	3,14	,816	- ,034	,285	3,23	,737	- ,417	,852
Price perception	€8,12	7,07	2,546	8,207	€8,72	7,151	2,472	7,410
WTP	€8,37	7,359	2,427	7,241	€8,82	8,177	3,013	12,589
Only Smell								
Intense	3,41	,963	- ,229	- ,393	3,16	1,102	- ,137	- ,828
Fruity	3,25	1,055	- ,326	- ,864	2,96	,871	- ,111	- ,323
Floral	2,78	1,119	- ,089	- ,856	2,66	,961	,170	,182
Woody	2,82	1,144	,194	- ,757	2,67	,973	- ,085	- ,980
Pleasant	3,55	1,119	- ,618	- ,207	3,39	,896	- ,356	- ,075
Appreciation	3,63	1,183	- ,582	- ,457	3,29	,965	- ,079	- ,528
Wine perception 1	3,56	1,091	- ,602	,026	3,22	,923	,341	- ,649
Wine perception 2	3,4	1,178	- ,531	- ,573	3,20	1,02	- ,176	- ,670

Wine perception 3	3,24	,929	- ,808	,102	3,06	,935	,033	- ,119
Wine perception 4	3,18	1,004	- ,377	- ,325	2,92	,966	- ,118	- ,787
Intention to buy 1	2,88	1,052	- ,186	- ,561	2,73	1,021	,235	- ,509
Intention to buy 2	3,04	1,058	- ,397	- ,610	3,00	1,02	- ,236	- ,603
Intention to buy 3	3,06	1,085	- ,414	- ,781	2,86	1,04	- ,048	- ,651
Positioning 1	3,04	,958	- ,364	- ,622	3,04	,871	- ,456	- ,683
Positioning 2	2,9	,964	- ,215	- ,565	2,96	,799	- ,173	- ,807
Positioning 3	3,18	,994	- ,370	,276	3,08	,868	- ,156	- ,722
Price perception	€7,97	4,384	,646	- ,364	€7,63	5,341	1,257	1,151
WTP	€8,01	4,299	,318	-1,064	€7,55	5,466	1,147	1,220
Only Taste								
Intense	3,36	1,102	- ,772	,073	3,26	1,192	- ,379	- ,68
Sweet	2,46	1,01	,377	- ,982	2,57	1,041	- ,083	-1,131
Acid	3,16	1,113	,041	- ,625	2,92	,986	- ,499	- ,782
Fruity	2,88	1,024	- ,237	-1,272	2,78	1,006	- ,294	- ,984
Woody	3,06	1,236	- ,253	- ,989	2,6	,99	- ,158	- ,954
Full-bodied	2,94	1,197	- ,106	- ,930	3,06	1,114	- ,215	- ,632
Alcoholic	3,48	,863	- ,333	,396	3,41	,888	- ,176	,149
Pleasant	3,18	1,131	- ,107	- ,483	3,2	1,143	- ,154	- ,932
Appreciation	3,1	1,111	- ,112	- ,647	3,1	1,074	,00	- ,597
Wine perception 1	2,9	1,159	,039	- ,815	2,94	1,096	,026	- ,918
Wine perception 2	2,9	1,266	,132	-1,078	2,86	1,195	,131	-1,062
Wine perception 3	2,88	1,130	,340	- ,653	2,94	1,077	,021	- ,79
Wine perception 4	2,74	1,121	,270	- ,765	2,8	1,069	,418	- ,797
Intention to buy 1	2,58	1,162	,245	- ,641	2,54	1,092	,433	- ,575
Intention to buy 2	2,66	1,255	,362	- ,828	2,74	1,103	,069	- ,838
Intention to buy 3	2,72	1,230	,221	- ,968	2,82	1,19	,136	- ,924
Positioning 1	2,7	1,074	,227	- ,314	2,74	1,065	,128	- ,691
Positioning 2	2,66	1,022	,263	- ,348	2,8	,833	- ,044	- ,759
Positioning 3	2,96	,947	- ,068	- ,231	2,96	,935	,403	- ,347
Price perception	€6,85	3,898	,570	- ,456	€7,81	5,166	1,385	1,722
WTP	€7,09	4,63	,626	- ,241	€7,71	5,752	1,853	4,847

(Source: SPSS)