AN EMPIRICAL STUDY OF

WINE-CONSUMERS' PREFERENCES

AND WILLINGNESS TO PAY

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PhD

The Hong Kong Polytechnic University

2019

The Hong Kong Polytechnic University

School of Hotel and Tourism Management

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A thesis submitted in partial fulfilment of the requirements

for the degree of

Doctor of Philosophy

July 2018

Certificate of Originality

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LISA YIP

Abstract

In the past two decades, researchers have investigated the relationship between the price of a wine and its quality. Numerous studies have been conducted on the influences of objective wine attributes on consumers' preferences. However, little attention has been paid to the sensory attributes of wine. In most cases, secondary data in the form of reviews, scores and tasting notes produced by wine experts and wine critics have been used to develop price-quality functions. Primary data generated by consumers have rarely been collected and analysed, and the relationship between consumers' sensory preferences and willingness to pay remains unclear.

Utility theory can be drawn on to describe how consumers' preferences affect the perceived value of wine because that value is determined not by its price, but by its attributes. This perceived value is also influenced by the consumer's background and his or her assessment of the situation. Hedonic-pricing models have been used in wine research for a number of years and its application has moved beyond the objective and sensory attributes of wine to include demographics and the circumstances of consumers. In addition, the hedonic function no longer includes market price but willingness to pay. Unlike previous studies, which have been based in a single country, this study constructs a hedonic-pricing model using data drawn from two countries: China and France. This study employs quantitative methods to examine similarities and differences between wine consumers from the two countries.

In this mixed-methods research the objective and sensory attributes of wine were first explored using a qualitative methodology in a pilot study conducted in May

and June 2016. The attributes identified were then fine-tuned to develop questionnaires designed to elicit rich quantitative insights in a larger study. Data collection was conducted in May to June 2017 in China in the cities of Chengdu, Shanghai and Shenzhen, and in June and September to December 2017 in France in Bordeaux, Burgundy and Paris. Participants were asked to state their preferred attributes of a wine before a tasting session and then to record their actual preference after trying a variety of wines.

The purpose of this study is to examine the similarities and differences between French and Chinese wine consumers through a hedonic-pricing analysis. Comparatively little research has been done on the social aspects of wine consumption.

Through an experimental examination of wine consumers' preferences and WTP for red wine, differences between the two cultures were assessed through hedonic-pricing models. Wine consumers from France were found to be willing to pay more for a wine with a well-known brand name but would not pay more for award-winning wines; they were willing to pay for the aroma, alcohol content and balance of the wine. Chinese consumers were willing to pay for the complexity and smoothness of a wine. Chinese wine consumers' willingness to pay was influenced by their gender, educational background, wine knowledge and age. Older Chinese women with a lower level of formal education had more knowledge about wine and were willing to pay more for it. In contrast, it was the younger French consumers who were willing to pay more for wines.

Overall, respondents' stated sensory preferences before they had tasted the wines were very different to the revealed sensory preferences after the tasting.

Additionally, more sensory attributes than objective attributes were statistically significant in the final hedonic-pricing models.

Key practical and theoretical implications of consumers' behavioural differences based upon their level of knowledge about wine are considered. A key marketing implication is that to increase Chinese consumers' willingness to pay, wine educators in China need to be involved in the selling of wine as consumers' knowledge of wine is correlated with willingness to pay. Wine educators will have to fill the gap that wineries traditionally fill because wineries are not widely available or accessible in China. For local or overseas wineries to target Chinese wine consumers, it is necessary to partner with wine educators to sell and distribute their high-quality wines.

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Acknowledgements

Coming to this check point, I am approaching the end of my PhD journey. As the first PhD in wine economics for the Hong Kong Polytechnic University, The School of Hotel and Tourism Management (SHTM), I feel excited, yet anxious about what this PhD will lead me into. I hope to be able to continue my research in the field of wine economics.

I feel I am in debt to SHTM on many fronts:

To Prof Haiyan Song from SHTM as my chief supervisor for providing guidance and extra attention all along. He understands that I am more mature and different to other fellow PhDs and has been mindful, and helped me to make decisions when I am at a cross road. I cannot recall how many times Prof Song has saved me from darkness. He generously provided me with the mental and physical support I needed. I am delighted to have the opportunity of being supervised by Prof Song, who is a renowned academic in field of Tourism and Wine economics. Therefore, the pressure is always high as I do not want to fail him;

To Prof Steve Charters, master of wine, as my co-supervisor from Burgundy School of Business (BSB), a master of wine for 18 years. I am inspired by his wine knowledge and his success in expanding his expertise into tourism. My three month attachments at BSB and various meetings with him have opened my horizons to meet new people and other wine economists through his network;

To Dr Murray Mackenzie from SHTM who gave me a door to knock on and to talk late in the evening. He famously said, 'A PhD is like a driving licence, not more or less.' He is my life coach and I thank him for his gracious sharing;

To Prof Nikos Georgantzis and Prof Lara Agnoli from BSB, with whom I shared numerous meals, casual discussions on ideas and fun when I was in Dijon;

To Dr Anyu Liu from SHTM, when I was dizzy headed at the time I first joined the school and I thank for him for patting my back;

To Prof Cathy Hsu as the chair professor; Prof Sam Kim and Dr Lorenzo Masiero as the committee members from SHTM, for their insights and feedback on my confirmation report;

To Dr Ksenia Kirillova from SHTM, who graciously let me learn from her and let me sit in on the wine marketing class. I feel I am in debt to her as she has also helped me to find a native French doctorate to review my French language questionnaire.

To Prof Gunter Schamel from Free University of Bozen-Bolzano and Dr Asli Tasci from Univesity of Central Florida as the external examiners; Dr Markus Schuckert as a board of examiner from SHTM for my oral defence. Your sharing of international insight and views as examiners has elevated my paper to a higher level. And last but not least,

Dean Kaye Chon from SHTM, who provided me with the opportunity to manage the study tour in Bordeaux and Burgundy with the Master in International Wine Management students.

I would like to take this opportunity to thank my wine sponsors, Tomy Wu from myicellar; Simon and Kelly Wong from Kampery Group; Guo Wanbo from Li's winery; Sam Hon from Grande Food and Wine; Amélie Touchais from Chateau Balac; Emma Gao from Silver Heights Winery; Ming and Michael Sze from Oriental Pearl; Hugues Dales from Chateau Pape Clement. And Matt Hui from

Sommelier who is my wine bag sponsor. Without their substantial support of 234 bottles of wines, and 80 wine bags, I would not have been able to complete my tasting research in the six regions. I would also like to extend my appreciation to all the venue sponsors, tasting respondents and pilot informants. All of them voluntarily joined my study and provided me with valuable insights to complete my research.

Returning to SHTM after 18 years of working in the field of education, I gained the latest research skills and methodology. I thank Prof Bob Mckercher, Dr Markus Schuckert, and Dr Lorenzo Masiero for their research subject teaching. I appreciate having known my best friends here, Dr Ksenia Kirillova, Dr Steve Pratt, Vanessa Yeung, Soey Lei and Ye Shun who was open to discuss any topic of interest.

With all these, I also have had the opportunity to be a wine judge for Wine100 Challenge in China; to help Jeannie Cho Lee, master of wine and professor of practice, with events and to participate in numerous events organised by SHTM. This has been a rewarding three years and I believe I have seized it all I can, all because of SHTM.

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List of Abbreviations

Objective Attributes

Code	Short form	Descriptions
A	AWARD	Award-winning
B	BRAND	Brand name
C	REPUT	Reputation
D	COO	Country of origin
E	ROO	Region of origin
F	FR & FAM	Friends and family recommendations
G	VARIETY	Grape variety
H	LABEL	Label and presentation, including bottle shape and cork design
I	PRICE	Price
K	CRITICS	Critics' score
L	VINTAGE	Vintage of wine

Sensory Attributes

Code	Short form	Descriptions
M	COLOR	Colour
N	AROMA	Aroma
O	ACID	Acidity
P	SWEET	Sweetness
Q	ALCO	Alcohol content
R	TANNIN	Tannin
S	WOOD	Wood taste
T	BAL	Balance (combination of sweetness, acidity and tannin)
U	LENGTH	Length
W	BODY	Mouthfeel / body
X	SMOOTH	Smoothness
Y	COMPX	Complexity / layered
Z	FDG	Flavour development in the glass

Chapter 1. Introduction

1.1 The Global Wine Market

In many countries today, the wine industry is growing and becoming a significant contributor to gross domestic product (GDP) and economic development. The European wine industry contributes substantially to global agricultural development, accounting for 45 percent of the world's wine-growing area, 65 percent of global wine production, 57 percent of international wine consumption, and 70 percent of global wine exports (European Commission, 2016)[1]. In France, the wine industry accounted for 15 percent of all agricultural and food revenue in 2015 (Business France, n.d.). In China, viticulture has gradually become a national phenomenon, and the total area devoted to grape production increased by 20 percent (141 k ha; see Table 1.1) from 2012 to 2016; by comparison, most countries experienced less or negative growth in the same period according to statistics from the International Organisation of Vine and Wine (OIV) (OIV, 2017). China also ranks high in the production of grapes globally; between 2012 and 2016 its total production has increased by 38 percent (to 14.5 million tons; see Table 1.1). In America, the increasing scale of wine and grape production has encouraged entrepreneurs to enter the wine business (MKF Research, 2010). Similar developments across the whole wine industry have benefited producers, wholesalers and distributors alike (Business France, n.d.).

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[1] 'Wine' in this thesis refers solely to fermented grape juice.

Table 1.1: Area under vine and grape production, selected countries, 2012 and 2016

Country	Area under vine (k ha)			Production of grapes (m tons)			Percentage production of wine grapes
	2012	2016	Difference	2012	2016	Difference	%
Spain	969	975	6	5.3	6.0	0.7	87%
China	706	847	141	10.5	14.5	4.0	12%
France	792	785	-7	5.4	6.4	1.0	99%
Italy	713	690	-22	6.9	7.9	1.0	85%
America	430	443	13	6.8	7.1	0.3	42%
Argentina	222	224	2	2.4	1.8	-0.6	77%
Chile	206	214	8	2.8	2.2	-0.6	52%
Australia	162	148	-14	1.7	1.8	0.1	78%
Germany	102	102	0	1.2	1.2	0	100%

Source: OIV (2017)
K ha: thousands of hectares; m tons: million tons

The trend of increasing wine consumption in Asia, especially in China and Hong Kong, is particularly noticeable in comparison with other regions worldwide (Table 1.2). Most countries experienced a decline in wine consumption in the five years from 2012 to 2016 after the financial crisis. America is the exception, with a 6 percent growth in consumption; China's consumption during this period remained constant. Since 2008, China, including Hong Kong, has overtaken United Kingdom to become the world's fifth largest wine-consuming nation, after America, France, Italy and Germany (OIV, 2017).

Table 1.2: Wine consumption and production, selected countries, 2012 and 2016

Country	Wine consumption (M hl)			Production of wine (M hl)		
	2012	2016	Difference	2012	2016	Difference
Spain	9.9	9.9	0	31.1	39.3	8.2
China	17.1	17.3	0.2	13.5	11.4	-2.1
France	28.0	27.0	-1.0	41.5	43.5	2.0
Italy	21.6	22.5	0.9	45.6	50.9	5.3
America	30.0	31.8	1.8	21.7	23.9	2.2
Argentina	10.1	9.4	-0.7	11.8	9.4	-2.4
Chile	3.2	2.2	-1.0	12.6	10.1	-2.5
Australia	5.4	5.4	0	12.3	13.0	0.7
Germany	20.3	19.5	0.8	9.0	9.0	0

Source: OIV (2017)
M hl: Millions of hectolitres

Notably, per-capita wine consumption in China and Hong Kong increased by 133 percent (Table 1.3) between 2005 and 2012 (OIV, 2016).

Table 1.3: Per capita wine consumption, selected countries, 2005 and 2012

Country	Wine consumption (litres per capita)		
	2005	2012	Difference
Australia	27.5	28.8	+4.7%
China	1.2	1.5	+25.0%
China + Hong Kong	2.1	4.9	+133.0%
France	67.0	53.6	-20.0%
Italy	53.6	43.2	-19.4%
Japan	2.3	2.8	+22.0%
United Kingdom	26.6	24.6	-7.5%
America	10.9	11.4	+4.5%

Source: OIV (2016)

The net exporting countries identified by OIV (2018) are France, Argentina, Portugal and Italy. These countries also have large domestic wine markets for their own products. Spain, Australia and New Zealand are primarily exporters, as they do not have similar domestic wine markets. Net importing countries, such as America, China, Germany, United Kingdom and Russia, also have sizeable domestic markets for the consumption of wine. China not only imports substantial volumes of wine; its population also consumes a considerable amount of domestic wine. Decanter China (2016) revealed that in 2014, 80 percent of all the wines consumed in China were domestic wines.

The business opportunities for European wine markets have shifted to emerging markets in Asia. As reported by Pernod Ricard, wine consumption has increased markedly in Asia since the global financial crisis, particularly in China, Thailand, India, Vietnam, Japan and Singapore. This trend is expected to continue, and China has achieved global recognition for its enormous potential for growth (Coutures, 2013).

A wine culture is developing in Asia, with an increase in the number of sommeliers, and with wine consumers expanding their knowledge and experience of wine. The growing tendency to consume alcohol without food has rapidly increased the consumption of wine globally, particularly in the female

segment of the market (Coutures, 2013). As wine has become more affordable for all consumers, consumption has increased further, especially among younger people (Coutures, 2013). In Japan, the combination of a high tariff on imported wine and a weak yen has promoted the consumption of domestic wines (Meiburg, 2015).

1.2 Research Purpose

In the past two decades, a significant number of researchers have investigated the relationship between the price and the quality of a wine. Numerous studies have been conducted on the objective attributes of wine and their influences on consumers' preferences (Angulo, Gil, Gracia, & Sánchez, 2000; Asgari, Woods, & Saghaian, 2016; Ashenfelter, Ashmore, & Lalonde, 1995; Byron & Ashenfelter, 1995; Combris, Lecocq, & Visser, 2000; Ginsburgh, Monzak, & Monzak, 2013; Huber & Weiss, 2010; Jones & Storchmann, 2001; Marchini, Riganelli, Diotallevi, & Paffarini, 2014; Oczkowski, 1994; Schamel, 2000; Schamel & Anderson, 2003; Steiner, 2004; Vittorio & Ginsburgh, 1996). However, little attention has been paid to the sensory attributes of wine.

A limited number of studies have focused on consumers when applying the hedonic-pricing theory to wine. In most cases, reviews, scores and tasting notes produced by wine experts and critics have been used to develop price-quality functions that represent experts' (Landon & Smith, 1997; Oczkowski, 2001) rather than consumers' preferences. Lecocq and Visser (2006) analysed data drawn from Bordeaux and Burgundy wine-tasting notes, and so focused on the preferences of wine experts, not of consumers. Oczkowski and Doucouliagos (2014) reviewed more than 180 papers based on the hedonic-pricing theory, and found that the correlation between the price of wine and its sensory quality rating

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was only partial at +0.30. Their result does not offer conclusive insights into consumers' willingness to pay, because wine is an experience good (Tozer, Galinato, Ross, Miles, & McCluskey, 2015; Verdu Jover, Montes, & Fuentes, 2004). As little research has been conducted on consumers' personal tasting experience of wine, the relationship between consumers' sensory preferences and willingness to pay remains unclear. One of the few empirical studies to investigate consumers' preferences and willingness to pay using the hedonic-pricing model and tasting data was conducted in France by Combris, Lecocq and Visser (1997), who investigated Bordeaux wine. However, the tasting data were drawn primarily from experts. Lange, Martin, Chabanet, Combris and Issanchou (2002) investigated the preferences and willingness to pay of French wine consumers, but focused on Champagne rather than still wine. Lockshin (2015) and Marks (2015) observed that the preferences of general wine consumers are being neglected, as a knowledge gap exists between industry individuals and knowledgeable consumers, and general wine consumers. The demographic characteristics of the 'knowledgeable' and 'general' groups of consumers differ, as do their satisfaction with, and perceptions of, wine attributes (Li, Jia, Taylor, Bruwer, & Li, 2011; Lockshin & Corsi, 2012; Lockshin, 2015; Song, Gartner, Hsu, & Gao, 2015).

The application of hedonic-pricing models to wine has received considerable attention from Western scholars. In contrast, the preferences of wine consumers in Eastern cultures have rarely been studied (see Table 2.5 and Table 2.7), yet the increase in wine consumption in Asia has gained international recognition. Vinexpo (2014) reported a 420 percent growth in the consumption of wine in Asia, from 4.2 million hectolitres in 1995 to 22 million hectolitres in 2011.

European consumption declined by 21 percent in the same period, from 72 million hectolitres to 57 million hectolitres. China, including Hong Kong, has become an important wine-consuming nation, with an average of 17 million hectolitres consumed per year. This is comparable to the equivalent figures for America (32 million hectolitres), France (27 million hectolitres), Italy (23 million hectolitres) and Germany (20 million hectolitres) (OIV, 2017). With its dramatic increase in consumption and substantial potential for growth, China has emerged as a powerful platform for wine sales and consumption. It is thus crucial for Western wine industry stakeholders to explore the preferences of Chinese wine consumers and to learn how the appreciation of wine differs between China and the Western world. Relatively little econometric research has been conducted on the Chinese wine market. Exceptions include a study of Chinese consumers in Hong Kong (Song et al., 2015), research on Chinese auction behaviour (Wang & McCluskey, 2010; Wang, 2011), and the use of conjoint analysis in a Chinese context (Xu, Zeng, Song, & Lone, 2014). There is clearly a large research gap to be filled by investigating Chinese wine consumers.

The aim of this study is to understand the similarities and differences between French and Chinese wine consumers and what attributes affect their willingness to pay. A few researchers have investigated variables such as a wine's country of origin (Asgari, Woods, & Saghaian, 2016; Combris et al., 2009; Song et al., 2015; Veale & Quester, 2009) or have compared consumers from two or more countries (Combris et al., 2009; Gergaud & Livat, 2007; Lewis, Lecat, & Zalan, 2015; Song et al., 2015). However, consumers' behavioural differences were not considered in these studies, and the hedonic-pricing theory was applied solely on a single-country basis. In addition, the respondent samples used in some of

these studies were small, and information on the respondents' countries of origin was unclear. Consequently, inconclusive results were obtained on preferences and willingness to pay. Several scholars have called for research focusing on the differences between consumers from different cultures (Jimena, Orrego, Defrancesco, & Gennari, 2012; Lockshin & Corsi, 2012).

In this present study, the hedonic-pricing model is applied to data drawn from two countries. In a previous study, theories of hedonic-pricing and willingness to pay were applied to empirical data from consumers' tasting notes to investigate consumers' preferences and willingness to pay (Lange et al., 2002); however, this research was conducted solely in France and addressed Champagne rather than still wine. French wine ranks number one among China's wine imports in terms of both volume and value (Ng, 2016a). France is one of the world's biggest wine-consuming nations (OIV, 2017): it exhibits consistently high production and consumption and leads the world as both a net exporter and a net importer. In comparison, China has experienced the world's greatest growth in wine consumption (Table 1.3), with a significant area under vine (Table 1.1); the country leads the world in importing wine (OIV, 2017). In this study, the country that ranks second globally in wine consumption, France, is compared with a country with significant potential for future consumption, China.

1.3 Research Background

1.3.1 China and Wine

China is the world's largest nation by population, with 1.40 billion inhabitants (United Nations, 2017), and the fourth largest nation by area, at 9.6 million square kilometres (Moran, Abramson, & Moran, 2014). The size of its tier-one cities is substantial: Shanghai, the fifth largest city in the world, has a population of 20.9 million; Beijing, China's capital, has 17.3 million inhabitants; and Guangzhou has a population of 16.8 million (Moran et al., 2014).

China has a long history in consuming and producing fermented products, mainly from rice. Along the Yellow River basin, rice wine can be found as long ago as 6000 BC. In the last three decades, China has experienced enormous economic growth as a result of policy reforms and the country's gradual opening up to the world (Li & Bardaji, 2016). The Chinese wine market has benefited from these policy reforms. The growth of domestic wine production is reflected in the substantial increase in grape production. Currently, there are 11 wine-producing regions (Figure 1.1) in China (Wine Folly, 2012). With its vineyards now covering 847,000 hectares, China has overtaken France (785,000 hectares) to become the country with the second largest area under vine, after Spain (OIV, 2017; Trotman, 2015). Ningxia leads the growth in production volume. In 1983, there was only one winery in Ningxia; by 2016, the region boasted more than 200 wineries (Phillips, 2016).

Figure 1.1: The Wine Regions of China

There has been a significant increase in wine consumption in China and Hong Kong in recent years, as seen in the volume of wine imported. Together, China and Hong Kong rank fifth in the world in terms of national wine consumption, after America, France, Italy and Germany (OIV, 2017). In China today, 20 percent of the wine consumed is imported, which means that 80 percent of the wine consumed is produced domestically (Decanter China, 2016). According to Ng (2018), in 2017, the volume of wine imported reached 552 million litres (Table 1.4), which represented a 14 percent increase since 2016 and a 513 percent increase since 2009. This indicates an enormous market for imported wine in China, despite import tariffs and consumption taxes that make imported wine much more expensive than domestic wine (NZ Trade and Enterprise, 2015). Although the Chinese consume a significant amount of domestic wine, Chinese wine is still perceived to be of a low quality. In an interview with *The Guardian* (Phillips, 2016), Chinese vintners revealed that Chinese consumers do not trust

the quality of Chinese domestic wine and in general, the Chinese prefer imported products. China's wine industry is relatively new, and Lee, Huang, Rozelle and Sumner (2009) believe imported wine will continue to dominate the Chinese wine market until higher-quality grapes are produced domestically.

Table 1.4: Volume of bottled wines, imported in China, 2009-2017

Year	Million litres
2009	90
2010	145
2011	240
2012	265
2013	275
2014	288
2015	395
2016	481
2017	552

Source: Ng (2016a, 2018)

It has been predicted that in the near future, all tariffs on wine in China will be reduced or eliminated altogether. Under the China-Australia Free-Trade Agreement (ChAFTA) signed in May 2015, the tariff on bottled wine from Australia has already been gradually reduced (Boyce, 2012). ChAFTA led to a 33 percent increase in the volume, to 105 million litres, and a 26 percent increase in the value, to US$682 million, of Australian wines imported into China (Ng, 2018; see Table 1.5). However, Chile was the first country to benefit from free-trade with China, following an agreement enacted in 2005. Similar free-trade agreements may be made with other countries, such as France, Italy and Spain, as China opens up further to the world.

Table 1.5: Top nine sources of bottled wines, by volume and value imported in China, 2016

Rank	Country	Volume (million litre)	Value (million USD)
1	France	217	1,051
2	Australia	105	682
3	Chile	74	266
4	Spain	67	149
5	Italy	29	139
6	USA	10	75
7	South Africa	8	24
8	Portugal	7	22
9	Argentina	5	22

Source: Ng (2018)

The slump in luxury consumption in China due to policy changes (Connor, 2015) has not affected the country's importation of wine. In 2016, China imported 217 million litres of French wine, representing an increase of 15 percent in a single year (Table 1.5). The value of its wine imports increased by 9 percent in the same year, reaching US$1,051 million. French wine represented 39 percent of the volume and 41 percent of the value of China's wine imports in 2016 (Ng, 2018).

The leading position of French wine in China may be shaken by the importation of wines from Australia and Chile. Sales of Chilean wine increased by 43 percent in China between 2012 to 2016, probably as a result of a tariff reduction (ChinaAg, 2016). The importation of Australian wine has also benefited from the bottle labels being written in English, a language spoken much more widely in China than other European languages; the labels are thus easy to understand, and the grape variety, for instance, is likely to be readily identified (Austrade, 2016).

There is a lack of brand awareness and limited promotion of imported wines in China. Foreign wineries use agents to sell wine in China. Most wine agents in China represent many brands, and are thus unwilling or unable to help individual brands to establish themselves. As a result, awareness of foreign brands is generally low (NZ Trade and Enterprise, 2015).

Red wine has a large market share in China, at around 75 percent of the market. According to the China Wine Report produced by the Mintel Group, 95 percent of China's wine consumers drank red wine in the 12 months prior to June 2015. Red wine has been found to be a starting point for many wine consumers in China (Ruisha, 2016) and is of higher status than other wines (Fountain & Zhu, 2017). With a consumption volume as high as 1.86 billion bottles, China is now the world's largest red wine market (Branigan, 2014).

Chinese entrepreneurs have not only invested in domestic vineyards but also acquired châteaux in France. Currently, more than 100 châteaux in Bordeaux are believed to have Chinese owners (Samuel, 2015). For example, Jack Ma of Alibaba acquired the Château de Sours and the Château Perenne in 2016 (Anson, 2016).

This study is designed to expand knowledge of wine consumers' willingness to pay beyond price preferences by determining the factors that influence demand. While other researchers have used conjoint analysis to study price preferences, this study applies experimental research methods to study consumers' preferences and WTP. It is important for wine makers to understand Chinese and French consumers' preferences in relation to the sensory attributes of wine and styles of wine (Bruwer, Saliba, & Miller, 2011) to ensure that supply meets demand, given both the growth in Chinese wine consumption and the oversupply of wine in mature wine-producing countries. China is now one of the world's most important consumers of red wine, and the aim of this research is to identify the factors that determine Chinese wine consumers' preferences. To provide a basis for examination of the influences of cultural differences on Chinese and

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Western consumers' preferences and willingness to pay, French consumers are chosen for comparison with Chinese consumers.

1.3.2 France and Wine

Asians first developed a preference for red wine, predominantly red wine from France (Meiburg, 2015). France is the most important wine-producing nation worldwide in terms of wine traditions, volume, grape style and quality (Marks, 2015). France represents a mature market for wine-making, and the French have a culture of wine consumption. France is also one of the world's biggest wine exporters, and has a long history of producing and consuming wine. French wine dates back nearly 2,500 years, when the Greeks spread wine cultivation knowledge and practices across Bordeaux, Bourgogne, Alsace, Champagne, Languedoc, the Loire Valley and the Rhône region (Charters & Gallo, 2014; Vins de France, n.d.). France represents a mature market for wine-making, and is a signature Old World[2] wine country (Lorey, 2014). The French have a culture of wine consumption and are leading the world by consumption per capita (OIV, 2016). France has long had an international reputation for high-quality wine (Campbell & Guibert, 2007). Napoleon III established the famous Bordeaux classification of wine in 1855 to showcase the strong industry base of France in the Paris World Exposition, which lasted six-month(Markham, 1998). France also has a quality system, established for over 80 years, with Appellation d'Origine Protégée (AOP) to recognise and to protect production origin by *Institut national de l'origine et de la qualite* (INAO) (Institut national de l'origine et de la qualité, 2016). French wine is also famous for reflecting the

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[2] 'Old World' denotes the traditional wine-producing countries (i.e. those with a long history in wine-making), which notably include France, Italy, Portugal, Germany and Spain. Source: Lock (2017); Robinson and Harding (2015).

terroir[3]. There are 50 wine regions in France (Institut national de l'origine et de la qualité, 2016), and over 10 of them are major growing regions, including Alsace, Bordeaux, Bourgogne, Beaujolais, Champagne, Cotes du Rhones, Jura, Languedoc, Loire Valley, Medoc, Provence and South West of France (Rossiter, 2016). The Bordeaux region has been producing and exporting wine for a long time. Bordeaux wine has dominated both in United Kingdom and elsewhere in Europe since 1154 (Campbell, 2007). The popularity of Bordeaux wine in China is remarkable. Between 2013 and 2015, Cohen (2016) conducted a marketing study, called the 'China Wine Barometer' (Table 1.6), with a sample of 5,000 Chinese consumers aged 18 to 49 in nine tier-one and tier-two cities: Shanghai, Beijing, Guangzhou, Shenzhen, Chengdu, Chongqing, Wuhan, Hangzhou and Shenyang. In terms of grape variety, Chinese wine consumers were found to favour Cabernet Sauvignon, followed by Pinot Noir and Merlot; in terms of country of origin, they preferred French, Chinese, Italian and then Australian wine; and in terms of region of origin, they preferred Bordeaux wine, followed by wine from Ningxia and Burgundy.

Table 1.6: Results of the 'China Wine Barometer' study, 2013-2015

Areas of wine	Preference	% (out of 100)
Grape variety	Cabernet sauvignon	72
	Pinot Noir	50
	Merlot	46
	Shiraz	28
Wine country of origin	France	90
	China	81
	Italy	69
	Australia	66
Wine region of origin	Bordeaux, France	85
	Ningxia, China	83
	Burgundy, France	59
	Barossa Valley, Australia	48
	Napa Valley, America	48
	Tuscany, Italy	45

Source: Cohen (2016)

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[3] 'Terroir' is a combination of favourable natural climate and soil, benefiting the growth of wine grapes. Source: Chapuis (2017), p.2; Robinson & Harding (2015) and Ulin (2007).

In the wake of the 2008 global financial crisis, France's consumption volume decreased from 34 million hectolitres to 28 million hectolitres. China is one of the few countries to have exhibited a growth in wine consumption following the economic downturn. According to the OIV (2016), Chinese consumption increased from 6 million hectolitres in 2002 to 7 million hectolitres in 2012 (Table 1.7). Although the total area under vine in China is similar to that in France, China's production volume of 13.5 million hectolitres lags well behind France's 41.5 million hectolitres.

Table 1.7: A comparison of Chinese and French wine production and consumption, 2002 and 2012

Country	Statistics	2002	2012	Difference
China	Exports in k hl	35	216	+517%
France		15541	15006	-3%
China	Imports k hl	495	4684	+846%
France		4588	5433	+18%
China	Production k hl	11200	13511	+21%
France		50353	41548	-17%
China	Consumption k hl	6428	7321	+14%
France		34820	28022	-20%
China	Consumption per person litres	1	2	+100%
France		71	54	-24%

Source: OIV (2016)
k hl: thousands of hectolitres

This study compares the willingness to pay for wine of Chinese and French wine consumers because both countries are big importers of wine (Table 1.7). France is a world leader in terms of both the consumption and the production of wine while China leads the growth in the consumption and production of wine. Section 1.2 demonstrated that there is lack of research taking a cultural perspective on consumption behaviour by means of hedonic-pricing

analysis. With this in mind, it is of interest to compare France, which has a long history in red wine consumption, with China, which has not. French respondents can be taken to represent Western behaviour, and Chinese respondents Eastern behaviour. Last but not least, the product-related factors for wine - the sensory and objective characteristics of a wine - are perceived differently by French and Chinese consumers.

1.4 Statement of Intent and Research Questions

The goal of this research is to identify the attributes of wine that affect wine consumers' preferences and willingness to pay. To determine which attributes are valued by wine consumers, a hedonic-pricing function is formulated.

The research question is:

> RQ: What are the price determinants perceived by Chinese and French wine consumers, and what affects their willingness to pay for wine, in an experimental setting?

1.5 Research Objectives

There are four objectives to this research:

1. To determine which objective and sensory wine attributes determine consumers' willingness to pay;

2. To identify the preferences of Chinese and French wine consumers and their willingness to pay for domestic and imported wine;

3. To investigate the influences of consumers' demographic characteristics on their willingness to pay; and

4. To compare Chinese with French consumers to evaluate the influences of consumers' self-evaluated knowledge on their willingness to pay.

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1.6 Research Contributions

1.6.1 Theoretical Contributions

Hedonic-pricing theory has historically been applied to a single country. The present study aims to extend the use of hedonic-pricing theory to its application in two countries, to compare willingness to pay between Chinese and French wine consumers with the same selection of Chinese and French red wines.

Using an empirical approach, the preference data of Chinese and French wine consumers on wine selection are collected in three progressive stages of information release and tasting: a blind tasting where sensory attributes are key; a semi-blind tasting, where the wine consumers are told the country of origin and region of origin of the wine; and in a natural setting, where consumers are provided with full information on the wines they are tasting. This enables the research to gauge consumers' willingness to pay for each wine in different information conditions, to reflect consumers' evaluation of sensory attributes; to assess how the country of origin influences their evaluation of sensory attributes; and to assess how the provision of objective attributes influences the consumers' evaluation of sensory attributes. Also, the stated willingness to pay will be determined by Chinese and French respondents' assessments of the sensory and objective attributes of the wines, which in turn will depend on the knowledge levels of the respondents and their demographic background.

Through a pilot study, a new sensory attribute 'flavour development in the glass' is introduced, and later used in the hedonic-pricing model. One aim of the main

study is to discover whether this newly added attribute is of statistical significance to Chinese and/or French wine consumers.

Finally, consumers' self-evaluated knowledge level, may help to explain any similarities and differences in the preferences of French and Chinese wine consumers, and this variable is included in the main study. Table 1.8 lists all the independent variable included in this study.

Table 1.8: A list of all the independent variables examined in this study

Independent Variables	Descriptions
Revealed sensory preferences	
COLOR	Colour
AROMA	Aroma
ACID	Acidity
SWEET	Sweetness
ALCO	Alcohol content
TANNIN	Tannin
WOOD	Wood taste
BAL	Balance
LENGTH	Length
BODY	Body
SMOOTH	Smoothness
COMPX	Complexity
FDG	Flavour development in the glass
Stated sensory preferences	
IMP COLOR	Importance of colour
IMP AROMA	Importance of aroma
IMP ACID	Importance of acidity
IMP SWEET	Importance of sweetness
IMP ALCO	Importance of alcohol content
IMP TANNIN	Importance of tannin
IMP WOOD	Importance of wood taste
IMP BAL	Importance of balance
IMP LENGTH	Importance of length
IMP BODY	Importance of body
IMP SMOOTH	Importance of smoothness
IMP COMPX	Importance of complexity
IMP FDG	Importance of flavour development in the glass
Interaction terms	
INT COLOR	Interaction - colour
INT AROMA	Interaction - aroma
INT ACID	Interaction - acidity
INT SWEET	Interaction - sweetness
INT ALCO	Interaction - alcohol content
INT TANNIN	Interaction - tannin

Independent Variables	Descriptions
INT WOOD	Interaction - wood taste
INT BAL	Interaction - balance
INT LENGTH	Interaction - length
INT BODY	Interaction - body
INT SMOOTH	Interaction - smoothness
INT COMPX	Interaction - complexity
INT FDG	Interaction - flavour development in the glass
Objective preferences	
AWARD	Award-winning
BRAND	Brand name
REPUT	Reputation
COO	Country of origin
ROO	Region of origin
FR & FAM	Friends and family recommendations
VARIETY	Grape variety
LABEL	Label and presentation
PRICE	Price
CRITICS	Critics' score
VINTAGE	Vintage of wine
Demographic variables	
GENDER	Gender
AGE	Age category
EDU	Education level
INCOME	Annual household income
DUMMY (FULL COND)	Dummy (condition of tasting)
DUMMY (CHINESE WINES)	Dummy (wine origin)
KNOWLEDGE	Consumers' knowledge

1.6.2 Practical Contributions

The study also makes practical contributions at an organisational level by expanding the existing understanding of the price determinants of Chinese and French wine consumers. Firstly, China is a developing country new to wine production, but has experienced a significant growth in wine consumption. Therefore, it is important for overseas wine producers to understand Chinese wine consumers' preferences (Wang, 2011). Gibbs, Tapia and Warzynski (2009) found that higher-quality wines have higher rates of exportation than lower-quality wines. Therefore, the findings of this research could help wine producers and marketers to determine export strategies and portfolios appropriate to consumers' preferences and willingness to pay. Specifically, as there is an increase in the quality and volume of wine production in China, this study will

also benefit exporters of Chinese wine by offering insights into the preferences of French consumers.

Secondly, consumption-based research traditionally relates high-involvement consumers to high volumes of wine consumption. This study examines the level of knowledge within the framework of hedonic-pricing analysis. It is believed that the knowledgeable consumers consume based on the perceived utility of objective and sensory attributes. Studying the relationship between the various sensory and objective attributes of wine and wine consumers' willingness to pay can help managers to improve their companies' competitiveness by increasing consumers' willingness to pay (Lewis & Zalan, 2014) and creating brand value through strategies designed to enhance the attributes valued by wine consumers in China and France.

Finally, due to globalisation and intense competition, wineries and wine agents rarely work within a single country. A lack of cross-country research has reduced the utility of information for producers and wine promotion agencies. The present study attempts to contribute to the wine industry, especially to wine producers and brands, wine retailers and distributors, and wine promotion agencies, by identifying and exploring the variables that affect consumers' preferences regarding wine.

Chapter 2. Literature Review

2.1 Introduction

In line with the recommendation of Creswell (2014), the literature review is presented in four sections: a review of utility theory; a description of the independent variables, including a review of models of wine consumers' food and beverage choices and 'involvement'; then an account of the dependent variable, willingness to pay (WTP); and an examination of hedonic-pricing theory. This is followed by an overview of the methods used to estimate WTP. Finally, the conclusion to the chapter describes the research gaps to be filled.

2.2 Utility Theory

Utility can be used to describe a consumer's satisfaction with a product. That is, satisfaction is not described by either the product or its price, but by the utility a consumer' perceives from the bundle of product attributes. Consumers have different perceptions of the value conferred by different product attributes. Utility theory is a description of consumers' preferences as affected by the perceived value of the product's bundle of attributes; the perceived value is also influenced by the consumer's background and his or her assessment of the situation (Bernoulli, 1738, 1954). Discovery of the utility, as Bernoulli discussed, is by observing consumers' WTP for different products. In this study, it is wine consumers' WTP for different wines that is observed.

Fishburn (1968) used utility theory to analyse the choice behaviour of consumers. Fishburn argued that consumers' preferences are affected by the combination of goods available. Price, income, and demographic background guide consumer choice. Utility theory, as further explained by Fishburn, discusses how

consumers' preferences can be affected by their perceived value of a product. Consumers will perceive value differently due to the utility of the attributes. Rational consumers, *ceteris paribas*, will have differing WTP for different products. A higher WTP signifies greater consumer satisfaction with the product's attributes.

Lancaster's theory of consumer preference (Lancaster, 1966) explains how consumers value sets of product attributes, rather than the product per se. Different products obviously have different sets of attributes. The assumption behind Lancaster's concept of preference can reveal the order of behaviour. When a consumer is observed to prefer attribute A over B, and B over C, the consumer has revealed a preference for A over C. Lancaster's rational choice theory, as an extension to his study on utility and consumer preference, suggests further that when making a comparison between products, it should be made between products with similar characteristics. While it is irrational to compare products with totally different characteristics, like wine and water, it is rational to compare wines. Such comparison will reflect the different quality attributes of wines as perceived by consumers.

Demand theory (Lancaster, 1966) addresses the influences on consumers' demand for a product, the cost of the product, the price of related goods, the income and preferences of the buyer, and the expected future price of the product. An experimental setting that eliminates income factors, *ceteris paribus*, should be used to enable analysis of the consumers' WTP for an individual product, and the consumers' WTP for related goods.

It is important to note that demand is affected by the nature of products. To understand how wine is categorised in the literature, Pan, Fang and Malaga (2006)

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studied the classification of beer, wine and wine coolers in China. Beer and wine coolers were found to be 'normal' goods, whereas wine was regarded as a luxury product. As a result, wine had a greater price elasticity at the time of the study. However, Cuellar and Huffman (2008) studied the demand for wine and concluded that wine is a normal good across variations in colour, varietal and price of wine.

2.3 Factors Influencing Wine Preferences

2.3.1 Shepherd and Sparks' Food and Beverage Preference Model

Shepherd and Sparks (1994) constructed a framework for analysis of consumers' food and beverage preferences and choices, and the factors that influence these preferences (Figure 2.1). Preferences for different products are found to be inter-related. Product-related factors are the sensory and objective characteristics of a product which affect consumers' perceptions of the product. Consumer-related factors (termed 'personal factors' henceforth) include demographic characteristics, education level, socio-economic status and cultural background, and the meaning of the product to consumers.
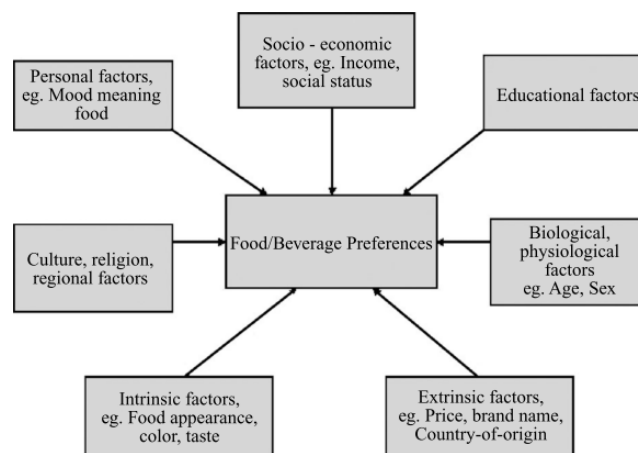
Source: Shepherd & Sparks (1994)

Figure 2.1: Food and Beverage Preference Model

2.3.2 Product-Related Factors

Over the years, ample research on wine attributes has been conducted in Western contexts. Like other food and beverage products, as defined by Shepherd and Sparks (1994), wine products have different sensory and objective characteristics that affect consumers' preferences. Goldstein et al. (2008) explored the American wine consumers' behaviour in a study of 6,000 observations from 17 blind tastings, and concluded that wine consumers use both sensory attributes, particularly taste and smell, and objective attributes, especially price and presentation, to evaluate wine. However, the review below (Tables 2.1 and 2.2) reveals that significantly more studies have investigated the objective characteristics of wine than its sensory characteristics.

Table 2.1: Sensory preferences, literature reviewed

Preference of consumers	Sensory	Sources	Key findings
American	Red (colour)	Cuellar & Huffman (2008)	Red wines are more price elastic than white wine.
American	Taste and smell of wine	Goldstein et al. (2008)	Sensory (taste and smell) are important
Australian	Sensory	Bruwer et al. (2011)	Female prefer sweeter and medium body wine at younger age. Fruit taste and aroma are important. Male prefer age characteristic of wine
Chinese	Alcohol content	Yu, Sun, Goodman, Chen, & Ma (2009)	High alcohol content is not preferred
Chinese	Sweet red	Li, Jia, Taylor, Bruwer, & Li, (2011); Liu & Murphy (2007); Somogyi, Li, Johnson, Bruwer, & Bastian (2011); Williamson, Robichaud, & Francis (2012)	Red wine, particularly sweet red wine is preferred. Red wine is the traditional Eastern preference of wine for the flavour, colour and the perceived health benefits. Red is a symbol of happiness and luck.
Chinese	Sensory	Camillo (2012)	Chinese's preference as sensory over country of origin, brand, wine style, price and accessibility, packaging then vintage.
Chinese	Sensory liking	Williamson et al. (2012)	Sensory liking is positively associated with sweetness, red and dark fruit, low acidity, peppery, low tannin, high alcohol, fruity aftertaste red wines
French	Alcohol content	Lecocq & Visser (2001)	High alcohol content is unnecessary
General	Acidity and alcohol content	Lockshin (2015)	High-involvement consumers prefer high acidity and low-alcohol wine products.

Table 2.2: Objective preferences, literature reviewed

Preference of consumers	Objective	Sources	Key findings
American	Award winning	Lima (2006)	Examined the relationship of award location to price and quality, by regression and estimate hedonic price function using data from tasting experiment with award-winning California wines, it is found that winning a medal is associated with high price and quality
American	Brand	Goldstein et al. (2008)	A recognised brand affects taste
American	Price	Goldstein et al. (2008)	Inexpensive wine are preferred more in blind taste
American	Price and presentation	Goldstein et al. (2008)	Objective factors (price and presentation) are important
Australian	Price	Bruwer et al. (2011)	Female preference of high-price wine
Australian	Price	Almenberg & Dreber (2011); Lewis & Zalan (2014)	WTP is affected by price for low-involvement consumers.
Chinese	Brands	NZ Trade and Enterprise (2015)	Brands are barely recognisable in China for consumption-grade wine
Chinese	Brand for high price wine	Liu & Murphy (2007)	Consumers are brand conscious, particularly towards high price they will look for recognisable brands
Chinese	Country of origin	Hu, Li, Xie, & Zhou (2008); Liu & Murphy (2007); Wang & McCluskey (2010)	Country of origin is most important factor to Chinese consumers, as indicator for wine consumption
Chinese	Price	Liu, McCarthy, Chen, Guo, & Song (2014)	There is also a growing trend for Chinese consumers in buying expensive wines for self-consumptions
Chinese	Price and Brands	Liu & Murphy (2007); Liu et al. (2014)	Distinguish behaviour of consumers towards non-luxury wine consumption, that they found it consumers prefer inexpensive wine to achieve highest value for money; while for consumers seeing wine as luxurious image product, they will prefer high-price and recognisable brands.
Chinese	Recommendations by friends and family	Liu et al. (2014)	Chinese wine consumers will also seek product reviews through recommendations by friends and family.

Preference of consumers	Objective	Sources	Key findings
Italy	Brands	Grazia, Malorgio, & Hertzberg (2008)	Brand is an indicator on quality
			No frills, private labels are not appreciated by wine consumers in Italy, as a mature Old World market wine consumers in Italy will look at other attribute like brandname
Japanese	Country of origin	Bruwer, Buller, John Saliba, & Li (2014)	Study explore the brand loyalty of wine consumers in Japan in relations to the country of origin, believe country of origin can signify product quality and portrait premium image to consumers.
Spain	Vintage	Mtimet & Albisu (2007)	Reserva wines, are found to have high utility due to wine's aging potential
General	Complexity	Groves, Charters, & Reynolds (2000); Wang & Spence (2018)	Complexity is important to consumer in evaluation of quality.
General	Price	Bagwell & Riordan (1991)	High prices means high quality
General	Price	Plassmann, O'Doherty, Shiv, & Rangel (2008)	Affect neural representations of experienced pleasantness.
General	Reputation	Landon & Smith (1997)	They studied how reputation and brands related to quality, that influence consumers' WTP for Bordeaux wines. Reputation will significantly affect consumers' WTP, and it also takes a much longer time for consumers to be aware about the change in product quality.
			Collective reputation of the region is equally important as the individual firm reputation
General	Reputation	Gibbs et al. (2009)	Study the influences of reputation on price - it concluded that naïve consumers are in strong sensitivity of price, to rating of quality

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In this section, the literature on product attributes that affect consumer preferences is presented. Price, quality and reputation are the most extensively studied attributes. Substantially more literature has been produced on objective than on sensory attributes. Numerous studies have investigated the influence on consumers' preferences of objective attributes such as country of origin, grape variety, price, brand, reputation, awards, friends and family recommendations, vintage and presentation.

2.3.3 Level of Involvement

A considerable body of literature has been produced on the classification of wine consumers. Spawton (1991) defined four categories of wine consumers by consumption pattern: first, wine connoisseurs, experienced wine consumers who drink frequently and enjoy different types of wine; second, aspirational drinkers, who enjoy learning about wine and socialising with wine; third, beverage wine consumers, who are loyal to particular brands and styles; and fourth, new wine drinkers, who have only just begun to learn about wine, and who drink primarily on social occasions. Seghieri, Casini and Torrisi (2007) surveyed 400 Italian wine consumers, examining their involvement with the product, their habit sensitivity and their price sensitivity. Four wine consumer segments were identified (Table 2.3): interested buyers, who seek high-quality wine; professionals of promotion, who are price sensitive and ready to try different wines; rational consumers, who seek information, quality and value for money; and usual buyers, who are loyal to particular styles and brands.

Table 2.3: Results of a segmentation study of Italian wine consumers

Segment	Mean age	Product involvement	Habits sensitivity	Price sensitivity
The usual buyers	Over 60	No	Positive	Negative
The rational consumers	About 43	Yes	Positive	Positive
The professionals of promotion	Youngest and female	No	Negative	Positive
The interested buyers	About 45	Yes	Negative	Negative

Source: Seghieri et al. (2007)

There are numerous studies from across the world on 'consumer involvement' in wine. A summary is included below (Table 2.4). In a study of the New Zealand wine market, Thomas and Pickering (2003) quoted McKinna's (1987) argument that the preferences of wine consumers can be categorised according to significant differences in their consumption behaviour. Four categories were identified: connoisseurs, occupying 25 percent of the consumer group under study; aspirational drinkers, occupying 51 percent of the consumer group; cask-wine drinkers, occupying 14 percent of the consumer group; and new wine drinkers, occupying 10 percent of the consumer group. Camillo (2012) categorised Chinese wine consumers by their age, income and consumption characteristics: 'young royals' are in their 30s, with the highest disposable income; 'aspirationals' are brand-conscious consumers who seek out affordable wine; 'established-money' consumers have an above-average income, are more mature than the members of the other groups and prefer exclusive wine products; and 'patriots' are mid-income, risk-averse consumers who are loyal to long-established brands. Liu et al. (2014) suggested three rather than four categories of consumer, defined in terms of what it is they seek from a wine: objective attributes, sensory attributes or a certain (usually high) alcohol content. Mtimet and Albisu (2007) showed that, in Spain, consumption frequency depends on consumers' level of involvement (discussed below). Connoisseurs and aspirational drinkers are high-involvement consumers, willing to pay high prices

for wines. Low-involvement consumers comprise beverage wine consumers and new wine drinkers, and prefer recognised brands and wines that have won awards. In a study of United Kingdom consumers, Bruwer et al. (2013) found that low-involvement consumers were brand conscious and tended to spend less on wine than their high-involvement counterparts. The latter were shown not to be brand conscious, and instead to be willing to explore different wines and look for information on wines in designated wine publications and magazines and on the Internet. Higher-involvement consumers were also found to spend more on wine.

Table 2.4: Summary of studies on consumer involvement in wine

Sources	High-involvement	Low-involvement
Charters (2006); Spawton (1991)	wine connoisseurs; aspirational drinkers	beverage wine consumers; new wine drinkers
Mtimet & Albisu (2007)	Connoisseurs; aspirational drinkers	beverage wine consumers; new wine drinkers
Thomas & Pickering (2003)	Connoisseurs; aspirational drinkers	cask wine drinkers; new wine drinkers
Camillo (2012)	established money; aspirationals	Patriots; young royals
Seghieri, Casini, & Torrisi (2007)	interested buyers; rational consumers	usual buyers; professionals of promotion
Liu et al. (2014)	Sensory attribute seeking customers	objective attribute seeking customers; alcohol level attribute seeking customers

Involvement is defined by psychologists as the extent to which a person is motivated and stimulated by an experience, event or product (Zaichkowsky, 1986). In this context, involvement is defined as the degree of interest consumers exhibit in a specific attribute of a wine relative to other attributes, and their willingness to invest time and effort in interpreting and understanding messages relating to wine (Lockshin, 2015; Schiffman, Kanuk, & Hansen, 2012). As observed by Lockshin (2015), categories of consumer preference can be established on the basis of level of involvement. In the current research,

consumers' involvement is combined with Shepherd and Sparks' (1994) food and beverage preference model; it is believed that consumers with different levels of involvement vary in their consumption pattern.

According to a study conducted in Australia, high-involvement wine consumers are knowledgeable about wine, regions and brands. Some are consumers only; others are in the trade or have a connection with the trade. High-involvement wine consumers think deeply about wine and its historical, philosophical and cultural significance (Lockshin, 2015). As observed by Charters (2006), high-involvement wine consumers are sensitive to the sensory features of a product. They prefer high-acidity and low-alcohol wines (Lockshin, 2015). Although they do not consider objective attributes to be important, they are concerned about a wine's region of origin and tend to establish relationships with retail outlets, whether online or offline (Lockshin, 2015). High-involvement consumers spend time studying, reading about and buying wine.

In contrast, low-involvement wine consumers are sensitive to objective product-related factors, particularly grape variety, product presentation, labels and colour (Charters, 2006). Low-involvement wine consumers do not possess much knowledge about wine; even those with a long history of drinking wine continue to rely on the recommendations of friends and family. They are sensitive to sweet wine, wine with a high alcohol content, and wine whose meaning is linked with special occasions. Region of origin or country of origin is not important to low-involvement consumers, who shop for convenience in supermarkets or other easily accessible locations (Grazia et al., 2008; Li et al., 2011; Liu et al., 2014; Lockshin & Corsi, 2012). Low-involvement consumers are sensitive to the information provided on the label on the back of a wine bottle (Balestrini &

Gamble, 2006; Bruwer et al., 2013; Grazia et al., 2008; Lockshin, Jarvis, D'Hauteville, & Perrouty, 2006; Yu et al., 2009).

Lockshin (2015) noted that low-involvement consumers are not clearly understood by the market, and are being ignored. This is because wine is generally made and marketed in line with the preferences of winemakers and wine marketers, who are high-involvement consumers. Lockshin's view of involvement is related to the individual's objective industry involvement in wine. On the other hand, Frøst and Noble's (2002) view of involvement is related to the subjective, consumers' self-evaluated knowledge level.

The degree of economic development of consumers' environment is believed to influence their WTP and price perceptions (Tse, Belk, & Zhou, 1989). Zhou and Nakamoto (2001) compared the price behaviour of young Chinese and young Americans. The behaviour of the Chinese respondents was not found to be consistent with Maslow's (1954) hierarchy of needs, the traditional model developed in the Western world, because China has a different value system. In contrast to the Western emphasis on satisfying basic needs and habitually negative price perceptions, Chinese people are motivated by the desire for social status, prestige and self-actualisation, and are willing to pay high prices to satisfy these needs (Belk, 1997; Zhou & Nakamoto, 2001). Therefore, although wine is always bought to satisfy consumers' desires (Amerine, 1966), the extent to which different attributes meet particular needs is a subject of further study in this thesis.

2.4 Willingness to Pay

2.4.1 Principles of WTP

When investigating price determinants, cost is a widely used indicator of supply. WTP has been commonly used in econometric studies to assess the utility of product attributes to consumers. It also has a long history in tourism research and economics (Kim & Crompton, 2001). WTP is defined as the maximum amount consumers are willing to pay for a product or service (Breidert, Hahsler, & Reutterer, 2006; Breidert, 2006; Varian, 1992; Wang & McCluskey, 2010). In the context of this study, WTP is the maximum amount consumers are willing to pay for a bottle of wine. This is the same as the minimum price at which a seller or producer is willing to sell a bottle of wine. At this price point, the consumer is equally likely to buy or not to buy, so this also represents a point of equilibrium. The underlying motivation for such buying and selling activities is how the utility bearing product attributes are valued and perceived by consumers (Yang, 2010; Yang, McCluskey, & Ross, 2009). WTP is also a form of circumstance-driven behaviour (Bernoulli, 1738, 1954). As documented by Breidert (2006), consumers' WTP for water differs between those buying water to drink at the beach and those buying water from a nearby shop on a hot summer's day; and WTP differs between students living on and off campus, depending on their perceived convenience and needs. WTP is also a valuation technique, and is extensively used to study auction and bidding behaviour (Yang, 2010). WTP, or the maximum amount a consumer is willing to pay for a product, is revealed during bidding, and can be analysed to identify the factors that affect consumers' perceptions. For three decades, WTP has been a popular valuation method due

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to its user-friendly experimental design and flexibility (Stabler, Papatheodorou, & Sinclair, 2009).

2.4.2 Studies of WTP

Camillo (2012) administered indirect questionnaires to 438 respondents in Guangzhou, China. He used strategic environmental scanning to investigate the Chinese wine market and consumer behaviour, and found that 59 percent of Chinese consumers are willing to pay up to RMB200/ €26.4 for a bottle of wine. Country of origin, sensory characteristics and word of mouth were found to be the most important factors affecting the WTP for a bottle of wine. Wang (2011) conducted a study with 423 Chinese wine consumers from Beijing and Shanghai on the influence of objective information on the decision to bid for wine from four countries: France, America, Australia and China. The study was designed to test the influence of different information conditions on WTP during a wine auction. Students reported a greater WTP than non-students, and French wine was preferred over wine from China, Australia and America. However, the results of this study shed no light on the influence of sensory attributes on Chinese consumers' preferences, as no tasting data were collected. As wine is an experience good (Tozer et al., 2015; Verdu Jover et al., 2004) any meaningful study of wine consumers' preferences must be based on respondents' empirical experience of wine. As neither Camillo (2012) nor Wang (2011) examined tasting data, their studies do not provide comprehensive insights into Chinese consumers' preferences.

Blind tasting enables sensory attributes to be separated from objective attributes (Tozer et al., 2015). Bazoche, Deola and Soler (2008) selected 139 respondents in Paris to take part in a tasting experiment to determine the relationship between

their WTP and environmental characteristics. The respondents were wine consumers who worked in wine sales but had not taken part in a consumer study in the previous three months. They were asked to evaluate French wine under three information conditions: a blind tasting of four wines; visual appraisal to six labels; and a tasting with full information on four wines. The second condition, visual appraisal, led to the highest WTP, followed by the full information condition, and then the blind tasting. Objective characteristics were found to affect consumers' WTP most. Although the aim of Bazoche, Deola and Soler's (2008) research was to study consumers' WTP for environmentally friendly, non-pesticide containing and organic wines, the organic certified wines were correlated with the lowest WTP values in the label-only assessment, suggesting that other factors affected the consumers' WTP. The reasons why these objective and sensory characteristics received high or low WTP values were not explored. There was also a considerable difference between the respondents' WTP for wine in the experiment (€2.3 /RMB17.4) and their average spending on wine in their daily lives (€5.3 /RMB40.1). Their finding signalled a low ratio of WTP in the experiment to their average WTP in real life. Conjoint analysis of 223 wine consumers from America yielded similar results. Appleby, Costanigro, Thilmany and Menke (2012) found that the presence of the phrase 'no sulphites added' on a wine label did not greatly enhance consumers' WTP, in that consumers were found to be willing to pay only €0.6 /RMB4.2 more for wine with no added sulphites.

Yang et al. (2009) argued that sensory attributes such as astringency, bitterness, aroma and flavour have a major influence on WTP. They studied the sensory preferences of consumers relative to those of a trained panel with three red wines

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produced in Washington State. They compared the influences of sensory attributes on the WTP of 60 respondents, and examined the influences of the intensity of these sensory attributes on the WTP of the same 60 respondents; they also studied the responses of a group of 11 trained experts. Consumers' preferred attributes, rather than the intensity of those attributes, were found to predict the WTP; attributes were not predictive for the panel of experts. The results of the intensity scoring also indicated that consumers favour less bitter wine with a high flavour intensity. In addition, the WTP of the consumers from America was higher for high-acidity wine but not for bitter wine. However, these findings are not conclusive, as the study did not provide a like-for-like comparison. The panel members were trained to rate astringency and bitterness, but were not required to rate the other sensory attributes evaluated by the consumer panel, namely aroma and flavour. The relative sizes of the expert panel and the consumer sample – the latter five times that of the former – may have skewed the results towards the consumer panel.

Gustafson, Lybbert and Sumner (2011) applied the WTP model to the responses of 236 American wine consumers to four Californian Cabernet Sauvignon wines. During the first stage of the study, the respondents were given appellation information; during the second stage, they received two expert critic scores; and during the third stage, they were given three winery names. The fourth stage was the wine tasting. The consumers' perceived objective preference for expert rating (WTP = €7.1 /RMB53.7) and that for winery of origin (WTP = €7.5 /RMB56.6) were greater than their sensory preferences (WTP = €6.8 /RMB51.8). Consumers' usual wine consumption expenditure and wine club membership were found to be positively related to WTP, suggesting that the respondents' sociocultural

background affected their WTP. However, the experimental design did not allow sensory preferences to be distinguished from objective preferences, as the information on appellation, expert scores and wineries was received prior to tasting.

In a study by Combris et al. (2009), sensory attributes and labels were found to be positively related to WTP. The WTP for Pinot Noir of 119 respondents from Paris and Munich was examined. Information was released in three stages, from a blind tasting to a label and presentation tasting, to full information tasting. Combris et al. is one of the few studies to have investigated the WTP of consumers from two Old World countries, and heterogeneous results were obtained, with no behavioural preference conclusively identified. WTP was found to be lower after blind tasting alone than under the full information condition. Therefore, a different grape variety, Chardonnay, was chosen for a second experiment: 64 wine consumers from Munich and 23 sensory experts from Dijon undertook the same three-stage tasting process. The results for WTP and wine ranking indicated that the sensory-expert respondents in France were sensitive to sensory evaluation of the Chardonnay wines. There was a significant increase in ranking when label information was released. The respondents from Munich were found to have a clear preference for the Bourgogne Chardonnay based on rank, although their WTP for the Bourgogne Chardonnay was lowest for all three information conditions. However, their study lacked detail, as sensory characteristics were presented only in terms of ranked preference, and the main objective characteristic under study was label information.

Yang (2010) claimed that a consumer preference model more accurately predicts consumers' WTP than an intensity model, a trained panel model, or an

instrumental measurement model. The two main factors that influence wine consumers' preferences and WTP are related to their personal characteristics. Consumers' preferences have been shown to be affected by their social and cultural background, economic status, education level, biological characteristics and personal experiences. Their preferences are also related to both the sensory and the objective features of wine.

2.4.3 Problems with WTP

Although a significant number of researchers have used WTP to study consumer preferences, WTP has tended to be a nominal value given by respondents, and the product or service attributes related to consumers' WTP have not been examined (Bazoche et al., 2008; Combris et al., 2009; Misra, Huang, & Ott, 1991). The use of WTP as an indicator of preferences has also been criticised by economists for its limited comparability (Reynisdottir, Song, & Agrusa, 2008), as WTP studies are conducted in varying contexts. The use of this indicator can cause over-estimation by consumers (Stabler et al., 2009; Tribe, 2015); for example, Balestrini and Gamble (2006) measured a 30 percent over-estimation of WTP among Chinese respondents. Some scholars have argued that WTP accurately indicates consumers' stated preferences within an experimental design that allows the highest bidder to win the product or service. However, such a stated preference model neither represents the real situation nor predicts future behaviour; it cannot be assumed that the same WTP is given by the same consumers on two or more occasions (Stabler et al., 2009; Tribe, 2015). In addition, a number of researchers have used conjoint analysis (Appleby et al., 2012; Breidert, 2006; Breidert et al., 2006; Veale & Quester, 2008, 2009) to investigate consumer preference in response to different price settings over a few

quality attributes. Veale and Quester (2008) conducted a conjoint experiment with three wines with different countries of origin, three price settings and three acidity levels. Conjoint analysis is not suitable for use with a large number of attributes, as Breidert et al. (2006) and Gustafson, Lybbert and Sumner (2016) argued, as under-estimation increases with the number of attributes analysed. It is important for a model to facilitate investigation of consumers' preferences over a range of sensory and objective wine attributes without over-simplification.

Hedonic-pricing models are another method used to evaluate the implicit price of product components. This method has been applied predominantly in single-country research and is discussed below.

2.5 Hedonic-Pricing Theory

Hedonic-pricing models can break down products by attribute, enabling researchers to identify the most important attributes affecting consumers' WTP, in short, to deconstruct WTP (Gustafson et al., 2016; Oczkowski & Doucouliagos, 2014).

2.5.1 History of Hedonic-Pricing

Court (1939), the leading proponent of hedonic-pricing, established a price valuation index. Through correlation and regression analysis of horsepower, automobile weight, and tyre size, the index was used to investigate the desirability and usefulness of passenger cars. This enabled comparison between hedonic-pricing models at different times. Before Court, Haas (1922) studied land prices. He established relationships between land price as a function of depreciation value, land classification, productivity of land, and distance. Wallace (1926) studied farm land value in Iowa, and formulated a coefficient to

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assess land value in Polk County. In Massachusetts, Waugh (1928) studied aspects of consumer demand to statistically assess the influence of quality on consumers' WTP. Waugh established relationships between consumers' WTP and crop size, vegetable variety, and marketing. Prior to Waugh's (1928) study, all research in this field had been conducted on the supply side. However, Waugh discussed consumers' WTP and indicated the benefits to farmers of controlling crop quality. Secondary data on price and consumers' preference for vegetables from Boston wholesale markets were collected and analysed. The results suggested that consumers were willing to pay more for greener asparagus and firmer and more neatly packed tomatoes, although the bargaining power of consumers – how consumers' preference affects price – was not investigated. Waugh's (1928) research established a firm foundation for later hedonic-pricing studies, especially in expanding the use of hedonic-pricing from the study of product attributes to the study of consumer characteristics.

2.5.2 Principles of Hedonic-Pricing

In the 1970s, Rosen (1974) modelled a hedonic-pricing function that connected consumers' value perception of the product attributes to consumers' WTP. Utility of these attributes is perceived differently by consumers. Each product, x, such as wine in this study, can be explained by a vector of N attributes, $z = (z_1, z_2, z_3.... z_N)$, and has an associated utility level, which can be represented by $U(z,x)$; i.e. consumers' preference for wine x by their preference of a bundle of wine attributes, z, that maximise utility. The value, as perceived by an individual consumer, is reflected by the WTP revealed. When similar classed goods (in the present study it is bottles of wine) are ranked side by side by consumers, a higher revealed WTP means a higher utility perceived by the consumers in the wine

attributes. Rosen's hedonic-pricing concept has been widely incorporated into wine research because the hedonic-pricing function is particularly suitable for use with attributes that cannot be easily unbundled: and WTP variation from one bottle to another, is comparable to the utility of the attributes perceived by consumers. Wine is a good example of a heterogeneous good, as it is impossible to completely separate its characteristics (such as sweetness, tannin, acidity, and balance). In contrast to the bundled characteristics of wine, the attributes of a mobile telephone (memory, colour, camera resolution, etc.), for example, can be separated. Therefore, wine consumers' preference demonstrates the maximum utility (*U*) of the product, i.e. *MAX U(z), subject to p(z) < K. K* is income, which signifies consumers' budget constraints. In a study of wine consumers' preferences, Veale and Quester (2008, 2009) also noted that consumers do not evaluate utility based on a single attribute, but evaluate each product according to its utility bearing characteristics.

Schamel (2000) established a hedonic-pricing model to investigate premium wines (costing more than €6.1 /RMB46.0) from North America, Australia, South Africa and Chile. He concluded that consumers' WTP for premium wine is affected by both implicit attributes - grape variety and sensory rating, and explicit attributes - reputation, region and scarcity of the wine. He found that, in general, a 1 percent increase in sensory quality led to a 2.9 percent increase in price, and that Cabernet Sauvignon had a higher premium than Chardonnay.

Golan and Shalit (1993) established a pricing model to examine the quality-related characteristics of grapes from Israel and wines from California. Blind tasting data were collected from expert respondents on the physical and chemical characteristics of the grapes and wines. The results were weighted by visual

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appearance (12 percent), aroma (24 percent), taste (40 percent) and general balance (24 percent). A non-linear relationship was observed between price and quality related characteristics, and an increase of one unit in the quality index raised the wholesale price by €1.2/RMB8.7 per bottle of wine.

Similarly to Golan and Shalit (1993), who included a range of variables influencing consumers' perceptions of utility in their hedonic-price function, Oczkowski (1994b) focused on the attributes of wine consumers rather than those of wine makers and grape growers. He studied Australia's wine industry, and established a hedonic-pricing model based on six attributes: quality, cellar potential, grape, region, vintage, and size of producer.

2.5.3 Debate in the 1990s and the 2000s

Although Rosen's (1974) hedonic-pricing framework has been widely applied in econometric research, it has also been subject to considerable debate in the last two decades. Unwin (1999) questioned the application of hedonic-pricing models in studies in the 1990s, especially those of Golan and Shalit (1993), Oczkowski (1994b) and Combris, Lecocq and Visser (1997). Unwin noted that analysis of the selected hedonic wine characteristics was impeded by limited data. In addition, as the researchers focused on different attributes and did not implement a stable hedonic-pricing framework, the results of their studies were not comparable. Unwin also suggested that researchers should target only repeat users, as first timers' lack of knowledge may distort the results of a hedonic-pricing model. Countering Unwin's criticism, Thrane (2004) argued that hedonic-pricing is the most robust method of evaluating product attributes. Thrane suggested that subsequent researchers should find ways to expand the range of independent variables used in hedonic-pricing studies to increase their

reliability. He also recommended that different hedonic models be used with different styles of wine to reflect the individuality of products in terms of their bundle of characteristics. Whilst conceding that data drawn from first-timers may not be relevant, Thrane suggested linking academic research more closely with business research to make the findings more readable and accessible to the general public. In addition, Thrane called for more primary research investigating wine attributes from the bottom up, from a consumers' perspective and under competitive conditions.

2.5.4 Hedonic-Pricing Applications

To determine which characteristics of a wine significantly affect its price, wine price is typically regressed on a set of experimentally collected sensory and objective characteristics. Lecocq and Visser (2006) used a hedonic-pricing function with a combination of experts' quality scores for three wines: two from Bordeaux and one from Burgundy. The sensory attributes tested were aromatic intensity, finesse of aroma, complexity, firmness of attack, acidity, suppleness, flatness, fattiness, concentration, harmony, finesse of tannin, finish, alcohol, staleness, reduction, and need for keeping. The objective attributes tested were region of origin, ranking and appellation, colour and vintage. This enabled the researchers to examine a wide range of objective and sensory wine attributes through hedonic-pricing estimation.

The leading hedonic-pricing researchers have always focused on the relationship between quality and price (Asgari et al., 2016; Huber & Weiss, 2010; Landon & Smith, 1998). For decades, hedonic-pricing models have been applied to objective qualities, due to the ease of data collection (Huber & Weiss, 2010; Oczkowski, 1994). The link between price and quality, in terms of reputation,

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critics' score, producer and brand, has been widely studied in the fields of economics and marketing (Balestrini & Gamble, 2006; Bruwer et al., 2013; Camillo, 2012; Grazia et al., 2008; Hu et al., 2008; Li et al., 2011; Lima, 2006; Liu & Murphy, 2007; Plassmann et al., 2008; Roberts & Reagans, 2007; Somogyi et al., 2011; Veale & Quester, 2008; Yang & Paladino, 2015). Huber & Weiss (2010) used a hedonic-pricing model to study the quality, reputation, and price of premium domestic Austrian wine. Based on secondary data, they found that an increase of one point in the critics' score (on a 100-point scale) increased wine price by 15 percent. Reputation was also found to be highly valued, with a one-unit increase in reputation increasing price by 21 percent; while age of wine, vintage and jury scaling were found to positively affect price. However, production volume was found to be negatively correlated with price. It is important to note that critics' and juries' score do not represent the preferences of real consumers, due to differences in information availability and in knowledge between experts and ordinary consumers. And even critics are found to produce inconsistent scores from time to time (Oczkowski & Doucouliagos, 2014).

Following Rosen, Oczkowski (1994b) investigated 1,600 wine samples to determine the relationship between price and quality. Oczkowski's hedonic-pricing function included the interaction terms *region*variety*, *vintage*variety* and *vintage*region* to capture the highest level of flexibility of attributes to price. He identified six major price determinants, all of which were objective attributes: quality, cellar potential, grape variety, region, vintage, and size of producer. In Oczkowski's account of a method of identifying wine bargains, he indicated the need to identify all of the attributes important to consumers. One major shortfall

of this paper was its experimental design, which did not involve tasting. The price determinants identified were thus based on a subjective review of secondary data from a consumer wine guide, and did not represent consumers' actual preferences.

Sensory and objective attributes have been investigated separately in a few studies. Combris et al. (1997) estimated a hedonic-pricing model with reference to both sensory and objective attributes. Seven objective variables were found to be particularly significant determinants of the price of wine, but only two sensory variables were found to be significant. However, the study did not give the respondents the opportunity to visually examine the 519 wines to determine their objective characteristics. Therefore, the study provided only an indirect interpretation of objective variables, without scientific validity. Furthermore, the wines were tasted by a jury panel, which did not represent real consumers. Although both Combris et al. (1997) and Oczkowski (1994b) concluded that objective characteristics are more significant than sensory characteristics, it is argued here that they provided insufficient evidence to rule out the contribution of sensory characteristics to consumers' price determination, due to the limited experimental design of both studies.

2.5.5 Combining Hedonic-Pricing Theory and WTP

Tribe (2015) described WTP and hedonic-pricing as distinct price valuation methods. He measured individuals' WTP to preserve an environmental asset by collecting data on the numbers of people who visited and used the asset, and those who cared about the asset but had not visited it. Total WTP was calculated by multiplying the average WTP by the number of people found to enjoy using the asset. According to Tribe's definition of hedonic-pricing, given the price-

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quality relationship, information on price and any factors that affect price should be collected for analysis. For example, Tribe identified several price determinants for house-buyers: features of house, condition of house, number of rooms, garden size, convenience for commuting, and proximity of shops. In comparisons of WTP with market price, hedonic-pricing models can aid the prediction of future price. This is especially useful in defining the quality of product features and thus identifying future opportunities.

Lange, Martin, Chabanet, Combris and Issanchou (2002) conducted a comparative study of the hedonic-pricing scores and WTP of two groups of consumers asked to assess Champagne. A three-stage information release process was implemented: stage one was a blind tasting; stage two was tasting with label and bottle presentation; and stage three was tasting with full information. This incremental release of information revealed a significant increase in WTP for Champagne when label information was disclosed. Consistent with the findings of hedonic and WTP studies in the Old World, this indicated that external information has a far more significant influence on consumers' preferences than sensory characteristics. A detailed examination of the results revealed differences in the consumers' hedonic scores and WTP. First, fewer high prices (WTP) than high hedonic scores were reported; as noted by the researchers, it is widely believed that it costs nothing merely to give a high score. This study's findings indicated that WTP is a good way of gaining insights into consumers' behaviour under normal economic constraints. The assessment of WTP and hedonic scores was made possible by the stage-by-stage provision of information. Another important contribution of this research was the finding that hedonic-pricing methods provide a sensitive means of analysing consumers'

sensory preferences. Although this comparative study involved two separate groups of consumers – one for each method under study – and investigated their respective behaviours, it demonstrated the value of combining the two methods (WTP and hedonic scoring) in one setting.

In a recent study, Gustafson et al. (2016) expanded their 2011 WTP research by combining hedonic-pricing and WTP methods to assess 250 consumers' WTP for wine available in California. A hedonic-pricing function was constructed with consumers' demographics, including gender, age and education level. The regression parameter estimates demonstrated that grape variety (WTP = €3.0/RMB22.6) had a more significant influence on consumer preference than appellation (WTP = €1.2/RMB9.3). Their study also demonstrated an increased reliability by using WTP, instead of market price, as a dependent variable in valuating estimates for wine attributes. However, their study focused only on objective attributes (wine age, appellation, grape variety and brand) without considering the sensory attributes. Survey data were collected in a supermarket without tasting, and so it seems that purchase behaviour instead of consumption behaviour was investigated.

A study by Song et al. (2015) of WTP and hedonic-pricing among visitors to Hong Kong inspired the current research on cultural differences. Tasting experiments were conducted at Hotel Icon, with 616 hotel guests as respondents. Three stages of information provision were used to separate the respondents into three groups: group one, blind tasting of six wines; group two, tasting of six wines with information on country of origin; and group three, tasting of six wines with full information. Hong Kong Chinese respondents made up 49 percent of the sample, other Asian respondents 11 percent, American respondents 10

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percent, European respondents 22 percent and other respondents 7 percent. The researchers concluded that consumers' WTP for wine was significantly affected by the country of origin of the wine, wine grape variety, consumer ethnic group, consumer age and consumer gender. Regarding the last two factors, younger respondents and male respondents were willing to pay more for wine than other respondents. There was no statistically significant interaction between respondents' stated importance of the sensory quality and the revealed preference of the sensory quality. In contrast with earlier WTP studies, the respondents in group one, who tasted the wine blind, indicated the greatest WTP. This result indicates that Asian consumers' preferences are driven by the sensory characteristics of wine, as long as they can taste the wine before buying. However, the experimental setting did not yield enough evidence to determine the factors that discouraged the second and third groups of consumers, for whom objective information was available. Although the Asian and Hong Kong Chinese respondents were found to be willing to pay more than the respondents from other ethnic backgrounds, 'Hong Kong Chinese' was not defined, as no distinction was made between Hong Kong respondents and mainland Chinese respondents. Therefore, the results for nationality were not conclusive. The study investigated a limited number of sensory attributes, and the seven chosen attributes were similar to those used in wine critics' weighted average scoring systems.

2.5.6 Cross-Country Hedonic-Pricing Applications

In an extensive review of the application of hedonic-pricing models to wine from 1994 to 2011, Jimena et al. (2012) found that 16 studies investigated New World[4] wine in the New World, 11 studies addressed Old World wine in the Old World and two investigated Old World wine in the New World. Most researchers analysed secondary market prices of wine using data collected from surveys, wine tastings, wine spectators and critics' score. Objective preferences were found to have been widely studied. A summary of the existing literature in this field, categorised by attribute focus, is provided in Table 2.5.

Table 2.5: Studies of WTP: country investigated and categories of attributes (sensory or objective) examined

Sources	Country	Categories of attributes studies
Oczkowski (1994b)	Australia	Objective
Ginsburgh et al. (2013)	France	Objective
Ashenfelter et al. (1995)	France	Objective
Byron & Ashenfelter (1995)	Australia	Objective
Nerlove (1995)	Sweden	Sensory
Vittorio & Ginsburgh (1996)	France	Objective
Combris et al. (1997)	France	Sensory and objective
Gergaud (1998)	France	Sensory and objective
Landon and Smith (1988)	France	Objective
Lima (2006)	USA	Sensory and objective
Combris, Lecocq, & Visser, (2000)	France	Objective
Angulo et al. (2000)	Spain	Objective
Schamel (2000)	America	Objective
Oczkowski (2001)	Australia	Sensory and objective
Schamel & Anderson (2001)	**Australia & New Zealand (New world)**	Objective
Jones & Storchmann (2001)	France	Objective
Lange et al. (2002)	France	Sensory and objective
Huber & Weiss (2010)	Australia	Objective
Steiner (2004)	UK	Objective
Lecocq & Visser (2006)	France	Sensory and objective
Combris et al. (2009)	**France & Germany (Old World)**	Sensory
Marchini et al. (2014)	Italy	Objective
Asgari, Woods, Saghaian (2016)	America	Objective

To date, insufficiently comprehensive insights have been gained into consumers' preferences for sensory and objective characteristics, particularly their sensory preferences. In the last 20 years, little research has been conducted on Chinese

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[4] 'New World' denotes those wine-producing countries with a relatively short history of wine-making, which notably include America (the USA as well as South American countries), Australia and New Zealand, and more recently countries in Asia (including China). Source: Lock (2017); Robinson and Harding (2015).

consumers' WTP, or on the reception of New World wine in the Old World (see Table 2.5).

Despite investigating consumers in two locations, Combris et al. (2009) focused on WTP only, without considering hedonic-pricing. There is a gap in the research on the application of cross-country hedonic-pricing models. Numerous studies have investigated secondary critics' scores and sensory preferences without consumer tasting data (Schamel & Anderson, 2001). Lima (2006) explored the relationship between price and quality at a California wine competition, which again failed to represent real consumers. As wine is an experience good, of which full knowledge can be gained only through consumption (Verdu Jover et al., 2004), it is concluded in this research that the gap in the literature can be filled by conducting tasting experiments to obtain information on wine consumers' WTP and hedonic scores. WTP is measured in terms of the maximum price consumers are willing to pay for a product, and hedonic-pricing breaks down the attributes important to price determination.

2.6 Cultural Differences in WTP

2.6.1 Cultural Differences

One of the weakness of WTP models is the lack of parameters to measure non-product specific characteristics, such as the influences of cultural and demographic characteristics on consumers' preferences.

In the book *Culture's Consequences: Comparing Values, Behaviours, Institutions and Organizations Across Nations* (Hofstede & Hofstede, 2001), Hofstede identified a set of universal dimensions of culture. He defined culture

as 'the collective programming of the mind, distinguishing the members of one group or category of people from others' (Hofstede, 2001, p.9).

Table 2.6: Hofstede's (2001) key dimensions of national culture and key scores on his 'combined index' among IBM staff in selected countries, including China and France, together with country rankings for wine consumption and production

Country (New / Old World)	Power distance (score)	Uncertainty avoidance (score)	Individualism (score)	Masculinity (score)	Long-term orientation (score)	Wine consumption (rank, 2016)	Wine production (rank,2016)
Australia (New)	36	51	46	56	31	10	5
Britain (Old)	35	35	89	66	25	6	-
Chile (New)	63	86	23	28	-	-	8
China (New)	**80**	**30**	**20**	**66**	**118**	**5**	**6**
France (Old)	**68**	**86**	**71**	**43**	**39**	**2**	**2**
Germany (Old)	35	65	67	66	31	4	10
Italy (Old)	50	75	76	70	34	3	1
Spain (Old)	57	86	51	42	19	7	3
America (New)	40	46	91	62	29	1	4

Source: Campbell & Guibert (2007); Hofstede (2001), p.500; OIV (2017)

In Hofstede's (2001) survey of the attitudes of 116,000 IBM staff from 1967 to 1978, different countries were defined by the key dimensions of national culture: power distance, uncertainty avoidance, long-term orientation, individualism versus collectivism, and masculinity versus femininity. A list of scores by dimension for different countries is presented in Table 2.6. Wine production and consumption rankings in 2016 are included for comparison. From this table, China and France are shown to be very different, especially on individualism.

Hofstede (2001) investigated individualism. A culture can be defined by the relationships between individuals. One of Hofstede's dimensions is to compare consumer behaviour in collectivist and individualist societies. People in the West have been shown to seek pleasure, reflecting their hedonic nature. They live freely and independently, spend a significant amount of time eating and drinking

(Tian, Hilton, & Becker, 2016) and engage in social gatherings as part of their daily lives. Matching wine with food is a distinctly Western activity, intended to maximise enjoyment. Wine consumers in the East enjoy networking and sharing wine with their friends, and value their friends' comments and recommendations. Wine is also regarded as a means of improving health by consumers in the East (Koo, 1984). Whereas people from collectivist countries have been found to favour products with a good reputation and those recommended by others; people from individualist countries, particularly European countries, tend to rely on their individual taste rather than objective attributes such as region of origin or friends and family recommendations (Gergaud & Livat, 2007).

According to Hofstede (2001), the degree of masculinity in a society has significant influence on purchasing behaviour, as it defines social norms and gender roles and thus governs the meaning of consumption, determining choice of food, preference for domestic or imported goods and reasons to buy. A preference for high-tannin and high-alcohol content wines is believed to symbolise masculinity, while sweetness and elegance are traditionally feminine tastes. In psychological terms, therefore, wine consumers in the East might be expected to prefer wine with more tannin and a higher alcohol content, although research indicates that they tend to prefer sweeter wine (Li, Jia, Taylor, Bruwer, & Li, 2011; Liu & Murphy, 2007; Somogyi, Li, Johnson, Bruwer, & Bastian, 2011; Williamson, Robichaud, & Francis, 2012). Cultural preferences apply to products and people. Products produced in developed countries are generally preferred to products from developing countries (Chao, 1993; Veale & Quester, 2009).

Table 2.7, as an extension to Table 2.5, summarises a review of 20 articles on consumer preferences and tabulates the characteristics of wine consumers as well as their preferences for particular objective and sensory attributes of a wine.

Table 2.7: The preferences and WTP of consumers from various countries: literature reviewed

	Sources	Demographic, socio-economic factors	Culture /economic theory	Country	Wine source	Consumer preference	
						Sensory	Objective
1	Yang et al. (2009)	Younger, positive correlated to WTP	-	American	American	Aroma, flavour, Astringency positively correlated to WTP	-
2.	Bazoche et al. (2008)	Environmental characteristics – non pesticides wine is partial correlated to WTP Visual WTP > full info WTP > blind taste WTP	-	French	French	-	-
3.	Combris et al. (1997)	Quality of Bordeaux wine is defined by Sensory characteristics market price is determined by objective characteristics	-	French	French	Concentration - positively correlated to WTP	Ranking in classification positively correlated to WTP Vintage positively correlated to WTP Region, appellation positively correlated to WTP
4.	Combris et al. (2009)	French preference for French wine when wine is known, but under blind situation is indifferent Munich WTP > Paris WTP	Masculinity Hofstede (2001)	French	French & American	-	-
5.	Cardebat & Figuet (2004)	Competition and information govern price (hedonic)	-	French	French	Aroma and flavour positively correlated to price	Appellation positively correlated to price Reputation is an important attribute for quality and price
6.	Gustafson et al. (2011)	Wine club membership positively correlated to WTP	Endowment effect Thaler (1980)	American	American	-	Appellation, grape variety positively correlated to WTP
7.	Gustafson et al. (2016)	-	-	American	American	-	Vintage, grape variety, winery positively correlated to WTP Appellation is not significant

	Sources	Demographic, socio-economic factors	Culture /economic theory	Country	Wine source	Consumer preference	
						Sensory	Objective
8.	Oczkowski (1994b)	-	-	-	Australian	-	Critics' score, vintage, grape variety, grape region, and producer size are important
9.	Schamel (2000)	Information model	-	American	American, Australian, Chilean, South African	-	Critics' score (sensory quality rating), positively correlated to WTP
10.	Schamel & Anderson (2001)	Income, wine production history and law of the country is positively correlated to WTP Regional reputations have become increasingly differentiated through time	-	-	Australian, New Zealander	-	Vintage, critics' score (sensory quality rating), winery rating and reputation of region, positively correlated to WTP.
11.	Lecocq & Visser (2006) Lecocq & Visser (2001) Combris et al. (2000) Combris et al. (1997)	Out of 15 sensory characteristics, only 2-3 have significant influence to the hedonic-pricing function	-	French	French	-	Ranking, vintage, appellation are important quality attribute for price
12.	Xu et al. (2014)	-	-	Chinese	Chinese, American, French	-	COO, Price influence on consumer sensory preference and WTP
13.	Wang & McCluskey (2010)	Household number, income, younger, male, well educated and employed - positively correlated to WTP Influence of information and role (student or resident)	-	Chinese	Chinese, American, French, Australian	-	COO influence consumer preference

	Sources	Demographic, socio-economic factors	Culture /economic theory	Country	Wine source	Consumer preference	
						Sensory	Objective
Pricing study, not WTP nor Hedonic							
14.	Gergaud & Livat (2007)	Connoisseur vs non connoisseur	Cross culture Individualism Hofstede (2001)	European Belgian, Danes, German, French, Netherlands, Swiss, British.	French	-	Price as quality indicator, influence consumer preference, more than umbrella branding, goodwill, past consumption
15.	Outreville (2012)	No Information vs full information Choice behaviour	Uncertainty avoidance Hofstede (2001)	European Canadian, French, Danes, Czechs	-	-	-
16.	Veale & Quester (2008)	-	-	Australian	French, American, Chilean	Acidity level didn't influence consumers' preference	COO, price influence on consumer sensory preference
17.	Landon & Smith (1998)	-	-	-	French	-	Reputation is an important attribute for quality and WTP.
18.	Oczkowski & Doucouliagos (2014)	Full information provision is important to consumers	-	-	-	-	Wine and producer reputation is an important attribute for quality and price
19.	Oczkowski (2001)	-	-	-	Australian	-	Reputation is an important attribute for quality and price.
20.	Dimara, Baourakis, & Kalogeras (2001)	Younger positively correlated to consume quality wine Male positively correlated to consume quality wine Education positively correlated to consume quality wine	Masculinity Hofstede (2001)	Greek	Greek	Aroma positively correlated to higher education, not married	Certification positively correlated to higher education, not married Packaging positively correlated to lower education and married

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Wines and consumers from a range of countries of origin have been analysed (Table 2.7). However, the review indicates that hedonic-pricing has never been used to study differences between two cultures. There is a lack of WTP and hedonic-pricing research in which consumers' evaluation of wine is compared between countries. One exception is a study by Combris et al. (2009) of French and German consumers' responses to French and American wine. There were distinctive differences between them. Under different tasting conditions, the French consumers reported a greater WTP when the country of origin of the wine was known, and indicated a preference for French wine. However, under the blind tasting conditions, there was little WTP difference between the French and the German consumers in their WTP for either the French or the American wine. A gap remains in the knowledge of French wine consumers' behaviour.

2.6.2 Cultural and Physical Distance

Wine can represent the culture and history of a nation. In locations in which consumers are more frequently exposed to wine, consumers' knowledge of the product – and consequently their familiarity with and expertise in wine – is greater (Alba & Hutchinson, 1987). Gergaud and Livat (2007) explained that with more knowledge of a product, one is better able to judge its sensory attributes. In this situation, consumers are less reliant on objective attributes. Knowledge accumulation may be related to the cultural and physical distance between consumers and products (Ghemawat, 2001). A domestic wine is physically closer to a wine consumer than an imported wine, increasing both the availability of the product and the consumer's understanding of it. In countries with a longer history of wine production and consumption, wine is culturally closer to consumers due to shorter physical distance and cultural distance.

Therefore, it is expected that French consumers will prefer domestic wine and Chinese consumers will prefer imported wines.

2.6.3 Exceptions to Economic Theory – Rational Expectations

Although the discussion above provides a holistic view of the behavioural preferences associated with different cultures, irrational behaviour can also be caused by rational expectations. Muth (1961) proposed the rational expectations theory of price movement, according to which price movements in most economic situations can, in part, be explained by people's expectations. For example, the prices of agricultural products fluctuate as a result of the expectations of farmers. Sargent (2008) argued that the rational expectations theory applies to both supply and demand, and that the value of a currency and its rate of depreciation depend on people's expectations of value and depreciation rate. This was demonstrated by the immediate currency depreciation following the UK's referendum on European Union membership in 2016 (Rovnick, 2016): the expectation that the pound would lose value contributed to its actual loss of value. According to Yao, Luo and Loh (2013), Chinese people tend to be irrational and speculative. If the government tightens monetary policy, Chinese investors will continue to acquire long-term or medium-term assets like houses and shares rather than leaving the market. Yao et al. (2013) identified the root cause of this behaviour as a lack of investment channels in China. Accompanied by an imperfect market, this leads investors to acquire assets continually to secure future profits.

Because of this, it is believed that Chinese consumers have high expectations of the future value of Chinese wine; therefore, it is expected that Chinese consumers will have a high WTP for Chinese wine.

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2.7 Methods of Estimating WTP

Breidert et al. (2006) and Breidert (2006) reviewed the methods used in previous studies to collect data on WTP. The main two approaches were the stated preference method, which involves surveys and/or questionnaires, and the revealed preference method, based on actual or simulated responses through market analysis or laboratory experiments. Both methods can be used to collect either primary or secondary data. Depending on the research objective, different results can be obtained.

2.7.1 Stated Preference Estimation

Conjoint analysis and discrete choice experiment have been widely used to analyse the relationship between product price and product features, such as mobile telephones with varying storage capacity, camera resolution and colour, and golf balls with varying driving distance, ball life and weight. Conjoint analysis and discrete choice experiments are used to study consumer preferences in a range of scenarios by measuring variation in product features against variation in price. Although results can be obtained rapidly from conjoint analysis, neither conjoint analysis nor discrete choice experiment can fully account for consumer behaviour, as both approaches are hypothetical. This reduces the validity of the results. Furthermore, in the context of wine, conjoint analysis and discrete choice experiments cast light on purchase behaviour only, not consumption behaviour. Consequently, neither conjoint analysis nor discrete choice experiments were considered to be suitable for the current research.

To gain insights into consumer preferences, a direct survey can be administered to a group of consumers. The respondents are asked to state the amount they

would be willing to pay for each product under study. This method requires a certain level of knowledge from consumers. In addition, it depends on whether the product can be objectively assessed.

2.7.2 Revealed Preference Estimation

Market data generally comprise historical purchase data, from which demand is commonly derived by regression. Although this method can be used to identify a trend in purchase behaviour, consumption behaviour is neglected. It is vital to stress that different members of the household may be responsible for consuming and purchasing goods, and that purchase behaviour is thus not equivalent to consumption behaviour. Therefore, the results of this approach to WTP and hedonic-pricing value do not represent consumers' real preferences.

An experimental approach is believed to offer researchers a means of accurately observing and recording consumers' preferences through the latter's direct experience of a product. This is particularly advantageous for experience goods (Tozer et al., 2015; Verdu Jover et al., 2004), whose attributes are not easily separated.

Table 2.8: Quantitative consumer preferences: literature reviewed

	Sources	Experimental design	Data analysis methods used
1.	Song et al. (2015)	Revealed preference Primary research (consumers) Instrument – questionnaire Tasting of wine	WTP, hedonic-pricing Regression
2.	Combris et al. (1997)	Revealed preference - scoring Primary research (expert / jury) Instrument – expert technical comment Tasting of wine	Hedonic-pricing Regression (no WTP)
3.	Cardebat & Figuet (2004)	Revealed preference - scoring Primary research (jury) Blind tasting only, wine	Hedonic-pricing (no WTP)
4.	Bazoche, Combris, Giraud-Heraud, & Traversac (2008) Combris et al. (2009)	Stated preference - auction (Becker-DeGroot-Marschak) Primary research (consumer) Instrument - questionnaire Tasting of wine – in three information conditions (blind, label only, taste and label)	WTP by information condition Regression (no hedonic-pricing)
5.	Gustafson et al. (2016)	Stated preference - auction (Becker-DeGroot-Marschak) Primary research (consumer) Instrument - questionnaire No tasting of wine	WTP, hedonic-pricing Regression
6.	Lange et al. (2002)	Stated preference – vickery auction Primary research (two separate group to bid (auction) and to score (hedonic)) Instrument - questionnaire Tasting of Champagne	WTP, hedonic-pricing results compared with vickery auction Regression
7.	Xu et al. (2014)	Stated preference Primary (consumer) interview Instrument - researcher No tasting of wine	WTP by conjoint analysis Utility by conditional logit model Regression

A summary of previous studies of WTP and hedonic-pricing with a focus on primary consumer research is provided in Table 2.8. In the present study, a revealed preference method is used to estimate WTP (Combris et al., 1997; Song et al., 2015). In addition, consumers' stated preference and their historic purchase behaviour are captured.

2.7.3 Experimental Design

Levitt & List (2007b) highlighted features of an experiment to be considered for study of consumer behaviour. These include mechanisms to anticipate bias due to weakness in the experiment setting and to ensure the collection of high-quality data, such as randomisation of both the location of data collection and the respondents.

A mindful experimental design will include mechanisms to closely monitor the respondents, to avoid spillover effects between different individuals in the tasting room (Charness et al., 2013).

A meta-analysis of hypothetical bias in a stated preference survey of WTP suggested that economic value may be over-estimated if it is derived from WTP (Murphy et al., 2005). This meta-analysis suggested that one should be cautious when generalising from WTP studies in which the samples have been drawn purely from a student population. Loomis (2011) conducted another meta-analysis addressing hypothetical bias and suggested that incorporation of a "cheap talk" method can reduce hypothetical bias. Loomis found that WTP results are more reliable than WTA results; he, in line with Murphy et al., concluded that the use of students as study subjects in experiments will reduce WTP ratings and hence increase the hypothetical bias.

Levitt & List (2007a) reinforced the significance consumer behaviour studies in stating that even where the results cannot be generalised for better understanding of consumer behaviour, the results still provide ideas for better interpretation of the consumer behaviour. Full details of the experimental design and data analysis are discussed in Chapters 3-6.

2.8 Research Gap

Further to the development of the utility theory and review of the latest hedonic-pricing applications, wine consumers' preferences are found to relate to the sensory and objective attributes of wine, and the consumers' demographics and related circumstances (Grazia et al., 2008; Gustafson et al., 2016; Song et al., 2015; Stefani, Romano, & Cavicchi, 2006). Numerous researchers have focused on objective attributes and their influence on consumers' price behaviour and WTP (Angulo et al., 2000; Asgari et al., 2016; Ashenfelter et al., 1995; Byron & Ashenfelter, 1995; Combris et al., 2000; Ginsburgh et al., 2013; Huber & Weiss, 2010; Jones & Storchmann, 2001; Marchini et al., 2014; Oczkowski, 1994; Schamel, 2000; Schamel & Anderson, 2003; Steiner, 2004; Vittorio & Ginsburgh, 1996); however, few have focused on sensory attributes. It is equally rare for both sensory and objective attributes to be investigated in studies of wine consumers' preferences and WTP. An extensive body of research has been conducted on consumers' price perceptions as represented by a small consumer focus group or jury of experts; however, the relationship between consumers' preferences and WTP has rarely been studied, particularly among low-involvement wine consumers. No comprehensive insights have been gained into consumers' sensory preference and WTP. As wine is an experience good (Tozer et al., 2015; Verdu Jover et al., 2004), experimental tasting research is required

to interpret consumers' preferences. In addition, few studies have investigated the determinants of WTP among Chinese consumers; exceptions include a study of Chinese consumers in Hong Kong (Song et al., 2015), research on Chinese auction behaviour (Wang & McCluskey, 2010; Wang, 2011). and the use of conjoint analysis in a Chinese context (Xu et al., 2014). Many researchers have used the hedonic-pricing theory and measures of WTP to study the relationships between price, quality and reputation. However, similarities and differences between two cultures have been neglected in the literature.

In the next chapter, the hypotheses for testing in the hedonic-pricing analysis are presented.

Chapter 3. Research Design

3.1 Hypothesis Development

3.1.1 Objective Factors

In numerous studies reviewed in the literature, scholars have attempted to explain how consumers' valuation of the wine is affected by objective attributes. Combris et al. (1997) used hedonic-pricing to study French consumers' responses to Bordeaux wine, and found that of nine important attributes affecting WTP, seven were objective characteristics. French consumers' WTP was found to be particularly affected by the ranking of wine in a classification system, vintage, region, and appellation. Lecocq, Magnac, Pichery and Visser (2005) studied French behaviour without tasting in an auction environment, and found that sensory attributes had a less significant influence on WTP once consumers had read labels and wine guides. Cardebat and Figuet (2004) demonstrated that French consumers are sensitive to the appellation and reputation of wine brands. In a condition without tasting, Landon and Smith (1997, 1998) found that reputation had an important influence on French consumers' evaluation of wine. Wine ranking, vintage, and appellation were found to be the most important factors determining French consumers' valuation of wine (Combris et al., 2000; Lecocq & Visser, 2001, 2006). In a tasting experiment by Combris et al. (2009), French consumers' preference for a wine increased substantially when they discovered that the wine was from France.

Few researchers have studied price determinants among Chinese wine consumers. Song et al. (2015) discovered that the WTP of Hong Kong Chinese consumers was sensitive to wine style, grape variety, and country of origin. As

revealed by marketing research, Chinese consumers use objective characteristics to evaluate wine quality due to their lack of wine knowledge (Balestrini & Gamble, 2006; Hu et al., 2008; Li & Bardaji, 2016).

WTP has been investigated in several Asia Pacific studies. In a study conducted in Australia, WTP was found to increase substantially between a blind tasting and the provision of objective information (Bruwer et al., 2011). Lewis and Zalan (2014) studied the relationship between WTP and price among 107 MBA students of an Australian business school, and found that WTP is affected by price for less knowledgeable consumers. Oczkowski (1994b) found that quality, cellar potential, grape variety and style, region, vintage and producer have a significant influence on consumers' valuation of a wine. In a study of Hong Kong Chinese consumers, Pettigrew and Charters (2010) in their earlier qualitative study suggested that sensory characteristics were irrelevant.

Although objective characteristics have been widely explored in studies based on hedonic-pricing analysis, few researchers have addressed the preferences and WTP of consumers based on both objective and sensory characteristics in full information tasting. To fill this gap, the following hypotheses are proposed:

Hypothesis H1: Wine consumers' WTP is influenced by the objective characteristics of wine when respondents are provided with full information on a wine during tasting.

Hypothesis H2: Wine consumers' WTP is influenced by the revealed quality of the sensory characteristics when respondents are provided with full information on a wine during tasting.

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3.1.2 Sensory Factors

Blind tasting has been found to be an essential method of assessing consumers' sensory preferences (Bruwer et al., 2011). Although few researchers have investigated Chinese preferences, Song et al. (2015) found that body and mouthfeel, flavour, after-taste, and overall quality affect Chinese consumers' WTP. The marketing literature has also documented that Chinese consumers prefer red wine to white wine and wine with a low acidity, dark colour, peppery taste, low tannin and high alcohol content (Williamson et al., 2012).

Studies of French consumers have had mixed results. The findings of three papers (Combris et al., 2000; Lecocq & Visser, 2001, 2006) investigating 15 sensory and objective characteristics suggest that French consumers value sensory characteristics less than objective characteristics. Cardebat and Figuet (2004) investigated French consumers' responses to French wine and found that aroma and flavour were highly correlated with price. Combris et al. (2009) suggested that sensory attributes and labels are positively related to WTP.

In a study of WTP in America, Goldstein et al. (2008) found in a blind tasting experiment that there was a negative correlation between price and enjoyment for low-involvement wine consumers but not for high-involvement consumers.

In light of the above, the following hypothesis is proposed.

Hypothesis H3: Wine consumers' WTP is influenced by the revealed quality of the sensory characteristics when respondents are asked to taste a wine without access to objective information.

3.1.3 The Effect of Interactions Between Sensory and Objective Factors and WTP

It is assumed that the explanatory variables are independent, but that the differential effects of certain factors may not be independent. 'Interaction' in statistical contexts describes the differential effects of experimental factors, and can reflect the relationships between them (Amerine & Roessler, 1976). According to Amerine and Roessler, wine judges rank wine differently at different times of the day, due to fatigue or sampling error, or seemingly arbitrarily. The significance of an interaction is determined by comparing the findings of analysis of variance with experimental error. A non-significant interaction signifies that factors are independent of each other. A significant interaction may indicate that other factors are affecting the experimental setting, such as respondents' personal circumstances, the location of the experiment or temperature in the experimental setting.

Another product-related factor that may indicate consumers' preferences is their ranking of the importance of wine attributes. Information on the relative importance of attributes as indicated by consumers has been shown by information integration theorists to enhance the assessment of consumer preferences. Lockshin (2015) found that the interaction between the stated importance of the wine attributes and the revealed preferences differed between low- and high-involvement wine consumers. In a study by Song et al. (2015) of Hong Kong Chinese, Asian, American and European, interaction was explored by measuring the relative importance of sensory attributes as ranked by the respondents. Interaction was found to have only a weak significance in the relationship between wine sensory attributes and WTP. However, it is argued

here that, as demonstrated in the pilot study (see section 4.2), consumers' assessment of the importance of their stated sensory attributes is found to affect their WTP. It is therefore suggested that the interaction between the stated importance of the sensory wine attributes before tasting, and their revealed preference for these sensory wine attributes should be studied. Therefore, the following hypothesis is proposed.

Hypothesis H4: Wine consumers' WTP is influenced by the interaction between their perceived importance of the sensory attributes and the revealed quality of the sensory attributes.

3.1.4 The Effect of Favouritism

A number of factors may affect consumers' preferences for wine; one is country of origin. Wang and McCluskey (2010) demonstrated that Chinese consumers' WTP for wine is affected by the wine's country of origin. The responses of students and wine consumers from Beijing and Shanghai to wines from China, France, America and Australia were studied in an auction setting (without tasting). Xu et al. (2014) demonstrated similar WTP behaviour among Chinese consumers with information on the country of origin of wine. The 'About Brands' study, conducted by NZ Trade and Enterprise (2015), suggested that wine brands are not widely recognised in China. Most foreign wineries hire local agents to represent their brands. As these agents represent several brands, they are unlikely to invest enough in any one brand to make it recognisable. Therefore, there is a lack of reputable brands of consumption-grade wine in China.

Whilst Hu et al. (2008) demonstrated that Chinese consumers prefer imported wine to domestic wine, Yang and Paladino (2015) argued that due to tax and price advantage, as well as enhanced perceived quality, Chinese consumers

prefer domestic wines. Yang and Paladino's finding that Chinese consumers prefer domestic wine is different to other studies of Chinese consumers, which generally indicate a preference for imported wine. Bordeaux is the biggest production region in France, with 25 percent of the total market production (CIVB, 2016). Forty-two percent of the wine produced in Bordeaux was exported, while 58 percent was consumed domestically in 2013-2014 (CIVB, 2016). French consumers respect their own wine culture and tradition. They are loyal to their domestic wines. Burgundians and the Bordelais prefer domestic wines and do not appreciate wines from other regions (Yip, Song, & Charters, 2017).

Liu et al. (2014) argued that as China's wine market matures, Chinese consumers are gaining more and more knowledge of growing regions, grape varieties, and food matching. In their study, Yu et al. (2009) found that consumers in Beijing mostly purchased domestic wines, followed by French wines. Country of origin has been found to be the most important objective attribute determining wine consumption decisions in China (Lockshin & Corsi, 2012). It is believed that country of origin will gradually become less important as an indicator of quality as the Chinese wine market matures. Chinese consumers are expected to become less reliant on objective attributes and more reliant on sensory attributes when evaluating wine. Chinese wine development is still in an early phase, and scholars' views on the Chinese preference for domestic or imported wine are polarised. Meanwhile, France has a mature wine-importing and wine-exporting market, and a recognised domestic wine culture. Therefore, the following hypotheses are derived.

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Hypothesis H5: Country of origin influences wine consumers' WTP.

Hypothesis H5a: Domestic wine has a positive influence on Chinese WTP; imported wine has a negative influence on Chinese WTP.
Hypothesis H5b: Domestic wine has a negative influence on Chinese WTP; imported wine has a positive influence on Chinese WTP.
Hypothesis H5c: Imported wine has a negative influence on French WTP; domestic wine has a positive influence on French WTP.
Hypothesis H5d: Imported wine has a positive influence on French WTP; domestic wine has a negative influence on French WTP.

3.1.5 The Effect of Demographic Factors

Millennial wine consumers across all countries have become the target segment for most retailers due to their increasing frequency of consumption, volume of consumption, willingness to pay for more expensive wines, and open minded attitude towards imported wines (Fountain & Lamb, 2011; Mueller & Charters, 2011). Song et al. (2015) found that the WTP for wine of Hong Kong Chinese and other Asian consumers, and that of American and European consumers, was highest among young consumers, who were inexperienced and infrequent wine consumers. The connection between youth and high consumption has been widely studied in America, but little research on younger people's wine behaviour has been conducted in China or Hong Kong (Lockshin, 2015). Millennial consumers represent an important group in terms of both size and value of consumption. Millennials in Australia and in emerging countries are also fond of spending money on wine and consuming wine excessively (Lockshin & Corsi, 2012). With greater purchasing power, they are willing to pay for bottled wine rather than bulk wine, and, in restaurants and bars, to pay for wine by the glass rather than by the bottles. The situation in France is different: millennials drink much less than their parents, leading to a wine surplus. Millennials in their early 20s have been found to be willing to try a range

of alcoholic beverages; that is, they are not loyal to any particular type of beverage (Lockshin, 2015). Several studies concluded that millennials are newcomers to the wine market, although they generally lack of knowledge and experience of wine (de Magistris, Groot, Gracia, & Albisu, 2011; J. Li et al., 2011).

The aging potential of wine is found to have a greater influence on older Chinese consumers than on young Chinese consumers (Li et al., 2011). Due to the *ganbei* culture, Chinese males – especially members of older generations – habitually drink rapidly and empty their glasses in one swallow. They also drink wine with a high alcohol content (Liu et al., 2014).

In studies of wine knowledge and drinking behaviour, Chinese women are expected to drink more wine than men in the future (Li et al., 2011; Liu et al., 2014). Although Chinese women consume less wine than males, they tend to consume higher-priced wine to compensate, and their drinking frequency has been found to increase with age (Bruwer et al., 2011). In a Japanese study, Bruwer et al. (2014) advised wine exporters to target females instead of males and provide them with wine-specific education. Lecocq et al. (2005) found that gender, income and consumption habits of French consumers have significant influences on their WTP for wine. However, age and nationality were not found to affect WTP.

Regarding level of education, Dimara et al. (2001) found that there is a positive correlation between quality of wine consumed and level of education. A sensory preference for aroma is positively associated with a higher level of education; and an objective preference for label and presentation is positively associated with a lower level of education. Contrasting views on the effect of level of

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education was noted from Gustafston's hedonic-pricing study, which found that, without tasting, a higher WTP was associated with a higher income and a lower level of education, while with tasting, a higher WTP was associated with higher income and a higher level of education. Wang and McCluskey (2010) for their study of 432 respondents, found that a higher level of education and a larger income affect Chinese consumers' WTP. In a study of French consumers, level of education was found to affect the WTP for one type of wine but not for another (Aumont, 2017).

These studies reveal that there is a relationship between wine consumers' demographic characteristics and WTP. Therefore, the following hypothesis is proposed.

Hypothesis H6: Wine consumers' WTP is influenced by their demographic characteristics.

3.1.6 The Effect of Consumers' Level of Knowledge

Level of knowledge of wine consumers, as discussed in the literature review, can be used to categorise wine consumers. Liu and Murphy (2007), in one of the first studies of Chinese wine consumption and purchase behaviour, found that, due to lack of knowledge, Guangzhou Chinese consumers rely on price as an objective factor when making purchase decisions. They will purchase at a high price for gifts, and a low price for personal consumption. After Liu and Murphy, a few others who studied Chinese wine consumers categorised them by their wine consumption and purchase habits and patterns (Camillo, 2012; Liu et al., 2014).

Research studies conducted by academics in a variety of disciplines have investigated cultural differences in food and beverage consumption. For instance, Tian et al. (2016) discuss beef consumers' preferences, while Grunert (1997)

studied the preferences (quality attributes and purchase habits) of French, British, German and Spanish consumers when purchasing steak. In the area of nursing, health and psychology, Lee, Jones, Mineyama and Zhang (2002) studied cultural differences between Chinese, Japanese and American samples in relation to Hofstede's (2001) cultural dimensions (as well as demographic differences). In the field of political science, Colman (2003) studied trends in policy on wine production, storage and consumption over the past 100 years and noted the relationship of wine consumption to social structure in America.

In relation more specifically to cultural differences in wine consumption, Yoo, Saliba, MacDonald, Prenzler, and Ryan (2013) studied consumers from Australia and Korea and compared their wine knowledge, purchase habits and consumption patterns. Bruwer et al. (2011), Charters (2006), McKinna (1987), Seghieri et al. (2007) and Spawton (1991) categorised wine consumers by their consumption preferences, purchasing behaviours and passion for learning about wine.

In China today, wine is not bought regularly; consumption remains very low (Liu et al., 2014; Yang & Paladino, 2015). Li et al. (2011) studied the frequency of drinking of young Chinese respondents, and found that fewer than 16 percent drank wine once a month or more; the majority (59 percent) drank wine only once a year. However, more than 97 percent of the respondents reported that they planned to drink more wine in the future, predicting a considerable increase in consumption in China. Song et al. (2015) found that the WTP of infrequent drinkers was higher than that of frequent drinkers. A study in Spain found that consumption frequency was closely linked to the knowledge level of wine consumers (Mtimet & Albisu, 2007).

Gergaud and Livat (2007) studied 6,000 European wine consumers, and explained that with more knowledge of a product, one is better able to judge its sensory attributes. In this situation, consumers are less reliant on objective attributes. Knowledge accumulation is closely related to the cultural and physical distance between consumers and product (Ghemawat, 2001). In countries with a longer history of wine production and consumption, wine is culturally closer to consumers due to shorter physical distance and cultural distance.

There is a view that cultural differences between French and Chinese consumers can be demonstrated by their level of knowledge about wine. Gustafson (2011) used a wine quiz to categorise wine consumers by their knowledge levels. In this study the self-evaluated knowledge level devised by Frøst and Noble (2002) has been used to assess how wine knowledge will affect consumers' WTP. The following hypotheses are proposed.

Hypothesis H7: Chinese consumers' WTP is influenced by their level of knowledge of wine.

Hypothesis H8: French consumers WTP is influenced by their level of knowledge of wine.

3.2 Experimental Design

An experimental design consistent with the research objectives was adopted. To address objective (1), to understand the influence of objective and sensory attributes on WTP, and objective (2), to investigate wine consumers' preferences and WTP for domestic and imported wine, an experiment with three information conditions (blind tasting; country of origin plus tasting; full information plus tasting) was conducted. This provided a means of evaluating the reactions of the

same group of wine consumers to three levels of information in a single experiment.

For the past ten years, scholars have made suggestions for experimental designs to evaluate wine consumers' preferences. Based on Thrane's (2004) and Unwin's (1999) review and recommendations, the WTP and hedonic-pricing tasting experiments have a three-stage tasting and information-release structure.

Combris et al. (2009) and Lange et al. (2002) began with a blind tasting, followed by bottle viewing then full information release; Song et al. (2015) followed a blind tasting with the provision of information on country of origin and subsequently full information release; and Bazoche et al. (2008) began with visual information, followed by full information and then a blind tasting. The timing of information release has been found to significantly affect the results (Goldstein et al., 2008). In this research, stated preference of the sensory attributes and objective attributes are first investigated; then at the tasting the actual preferences for particular sensory attributes are revealed. A three-stage tasting process was implemented: the same consumers first blind-tasted the wine, then tasted the wine with information on the wine's country of origin and region of origin; and finally tasted the wine with full information.

To address research objective (2), a tasting of six wines from China and France – two for each of the three-stage of the tasting process – was conducted in China and France.

In this study, it was assumed that when consumers perceived a higher satisfaction from the attributes, the utility of the product is higher, giving rise to a higher WTP for a particular bottle of wine. It is assumed there is no diminishing

marginal utility when more units of wine are consumed; and that there are no economic constraints due to income that will hinder consumers' preferences and choices.

3.2.1 Stage One – Blind Tasting

Blind tasting has been shown to be an invaluable means of assessing consumers' preferences (Bruwer et al., 2011). In the blind tasting conducted in this study, respondents were asked to taste two wines blind and score each listed attribute on a Likert scale from 7 (more desirable) to 1 (less desirable). The consumers were then asked to indicate how much they would be willing to pay for each of the wines in a retail store or online. Finally, the consumers indicated their preference by ranking the wines from 7 (more desirable) to 1 (less desirable). Reference was made to the 10-level Likert scale used in Song, Gartner, and Marlowe (2016). Table 3.1 displays the 10-levels used for the study.

Table 3.1: The 10 levels of WTP on the Likert scale used in the present study

France: WTP in euros	China WTP in RMB
53 or more	371 or more
45-49.9	336-370
40-44.9	301-335
35-39.9	261-300
30-34.9	226-260
25-29.9	181-225
20-24.9	151-185
15-19.9	111-150
10-14.9	75-110
Under 10	Under 75

The first part of the experiment was designed to investigate sensory characteristics only. Factors that encourage the expression of both conscious and subconscious preferences, rather than simply providing an indication of consumers' subconscious behaviour, were avoided. First, the taste experiment in stage one was designed to ensure that objective attributes do not affect consumers' preference or WTP. Second, the objective attribute of price was

found to have the greatest influence on both the conscious and the unconscious behaviour of wine consumers (Lockshin, 2015). The first stage of the experiment was designed to exclude the influence of price.

3.2.2 Stage Two – Blind Tasting with Country of Origin of Wine

This stage was designed to assess the influence of a wine's country of origin on the WTP of consumers from different nations. Hu et al. (2008) and Wang and McCluskey (2010) showed that country of origin is the most important feature of wine for Chinese consumers, and Yu et al. (2009) demonstrated a significant preference for French wine among Chinese consumers.

In the second stage of the experiment, respondents were provided information on country of origin and region of origin for wines three to four, and again asked to rate the wines' sensory attributes and indicate their WTP for each wine. Finally, the consumers were asked to rank wines three to four on a scale from 7 (more desirable) to 1 (less desirable).

3.2.3 Stage Three – Tasting with Provision of Full Information

The information provided on labels on the back of wine bottles has been found to be a crucial determinant of consumers' preferences, particularly those of low-involvement consumers (Balestrini & Gamble, 2006; Bruwer et al., 2013; Grazia et al., 2008; Lockshin et al., 2006; Yu et al., 2009). Objective attributes are influential once consumers have been provided with both sensory and objective information (Lecocq et al., 2005). Balestrini and Gamble (2006) and Li and Bardaji (2016) demonstrated that Chinese consumers tend to use objective attributes rather than sensory attributes to evaluate wine quality, due to their lack of wine knowledge. Bruwer et al. (2011) in their study concluded that consumers'

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WTP increases when objective information is provided after a blind tasting.

Lewis and Zalan (2014) studied the relationship between price and WTP with a sample of 107 MBA students at an Australian business school. Similarly to Almenberg and Dreber (2011), who sampled 135 students and researchers in Boston, US, Lewis and Zalan (2014) found that the WTP of low-involvement consumers is affected by price. One of their most important findings was that evaluation is more easily directed downwards by low prices than directed upwards by high prices; that is, consumers are more easily 'talked down' than 'talked up'(Almenberg & Dreber, 2011).

In the third stage of the experiment, consumers were provided with full information on wines five to six, as available in a natural setting. Consumers were again asked to rate the sensory attributes of the wines and note their WTP for each wine. Finally, the consumers ranked wines five to six on a scale from 7 (more desirable) to 1 (less desirable).

The six wines chosen for the experiment are from China and France (Table 3.2). Wines one, three and five are red wines from China (wines three and five differ by brand but have a similar retail price). Wines two, four and six are red wines from France (wine four and wine six differ by brand).

Table 3.2: Wines used in the present study, by order of tasting

Stages and information provision	Wine	Country of origin of wine	Region of origin of wine
Stage one – Blind taste	1	China	Yunnan
	2	French	Bergerac
Stage two – Taste with COO & ROO information	3	China	Ningxia
	4	French	Bordeaux
Stage three – Taste with full information provision	5	China	Ningxia
	6	French	Bordeaux

3.3 Conceptual Framework – Proposed Hedonic-Pricing Function

The Rosen (1974) hedonic-pricing model has been applied to wine-related research for a number of years and its application has moved beyond the objective and sensory attributes of wine, to include consumer demographics and circumstances. In addition, the hedonic-pricing function has extended beyond market price, to WTP (Gustafson et al., 2016; Lecocq & Visser, 2006; Oczkowski, 1994; Song et al., 2015; Stefani et al., 2006).

Differing from the studies based on a single country in the past, this study estimates the hedonic-pricing models using the data drawn from two countries, China and France. In light of the research design, and based on scholars' estimation of WTP by linear regression, the following hedonic price function is formulated:

$$WTP_{i,j} = \alpha_{i,j} + \sum_{n=1}^{12}(\beta_{1,n} Sen_{n,i,j} + \beta_{2,n} Imp_{n,i} + \beta_{3,n} Sen_{n,i,j} * Imp_{n,i}) + \sum_{m=1}^{11}\beta_{4,m} Obj_{m,i,j} + \beta_5 Fav_{i,j} + \beta_6 Dem_{i,j} + \beta_7 Kno_{i,j} + \beta_8 Cond_{i,j} + \varepsilon_{i,j}$$

$$Equation\ 1$$

Adapted from: Song et al. (2015), p.9

where $WTP_{i,j}$ is consumer i's willingness to pay for wine j; $Sen_{n,i,j}$ denotes the sensory attributes of wine j; $Imp_{n,i}$ is the importance of sensory attributes to consumer i; and $Sen_{n,i,j}*Imp_{n,i}$ is the interaction effect of sensory attributes on the importance of the corresponding attributes to consumer i. Twelve sensory attributes, n, are investigated. $Obj_{m,i,j}$ denotes the objective attributes of wine j to consumer i. Eleven objective attributes, m, are investigated. $Fav_{i,j}$ is a wine's country of origin, and equals 1 for Chinese wine and 2 for French wine. $Dem_{i,j}$ is estimated for demographic factors affecting $WTP_{i,j}$. $Kno_{i,j}$ is estimated for the

knowledge level of consumers affecting $WTP_{i,j}$. $Cond_{i,j}$ is a dummy variable for the tasting condition, equal to 1 for stage three and 0 for stage one and stage two under the full information condition; equal to 1 for stage two and 0 for stage one and stage three under the country of origin and region of origin information condition; and equal to 1 for stage one and 0 for stages two and three under the blind tasting condition. $\alpha_{i,j}$ is the intercept term, β is the parameter to be estimated and $\varepsilon_{i,j}$ is the error term.

The 12 sensory attributes of wine j are colour, aroma, acidity, sweetness, alcohol content, tannin, wood taste, balance, length, mouthfeel, smoothness and complexity. The 11 objective attributes of wine j are brand, reputation, awards, country of origin, region of origin, friends and family recommendations, grape variety, label and presentation, price, critics' score, and age.

Dummy variables are widely used in hedonic-price studies to enable one set of variables in the system to be mechanically removed for comparison (Suits, 1984). Parker and Zilberman (1993) used dummies to perform a cross market comparison of peaches from California. The application of hedonic-pricing in this study was similar to that of Oczkowski (1994b) and Song et al. (2015).

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Chapter 4. Research Methodology

In this chapter, details of the research methodology, the data collection and the data analysis are discussed. The methods used to test model reliability are also presented.

4.1 Mixed-Methods Research

The use of mixed methods dates back to the 1980s. This approach was initially subject to considerable debate, but has since been used in various disciplines throughout the world. Mixed-methods research entails the collection, integration and analysis of qualitative and quantitative data in a single study (Creswell, 2014).

> Mixed methods is an approach to inquiry involving collecting both qualitative and quantitative data, integrating the two forms of data, and using distinctive designs that may involve philosophical assumptions and theoretical frameworks. The core assumption of this form of inquiry is that the combination of qualitative and quantitative approaches provide a more complete understanding of a research problem than either approach alone.
>
> *Source: Creswell (2014), p.4*

Qualitative research methods are subjective and conducted in uncontrolled natural environments, with the researcher as the main instrument. Qualitative research must involve the informants. Qualitative methods are inductive and designed to produce rich descriptive responses for analysis and documentation (Savin-Baden & Major, 2013). The questions used in qualitative interviews and focus groups are unstructured and open-ended (Creswell, 2014).

Conversely, quantitative research is objective, the questionnaire is its main instrument and the research is conducted in a controlled setting. The human touch of traditional qualitative research is kept to a minimum. Quantitative

methods are deductive and designed to produce concise, numerical responses for analysis and documentation (Savin-Baden & Major, 2013). The questions used in quantitative surveys are tightly structured and usually closed-ended (Creswell, 2014).

In his experimental research on consumer choice, Goodman (2009) stated that the use of a variety of methods, qualitative and/or quantitative, yields insights into a range of consumer behaviour. Quite a few researchers have argued that qualitative methods can provide more context for discussion when the 'why' questions are asked (Charters & Pettigrew, 2006; Mitchell & Hall, 2004). To recapitulate, the first objective of the current research is to identify the objective and sensory wine attributes that determine the WTP of French and Chinese consumers, and the second is to investigate their preferences and WTP for domestic and imported wine. Although quantitative data permit analysis of price determinants, it is also important to consider as wide a range as possible of attributes that affect consumers' preferences. Therefore, a qualitative pilot study was undertaken prior to the quantitative research to define and refine the list of attributes; this pilot study took the form of interviews with French and Chinese wine consumers. Thus, an exploratory sequential mixed-methods research project combining both qualitative and quantitative analysis was undertaken (Figure 4.1).
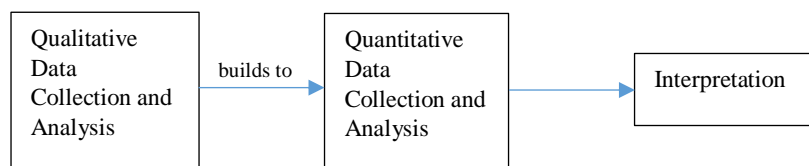
Source: Creswell (2014), p.220

Figure 4.1: Exploratory Sequential Mixed-Methods Research Study

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The objective of exploratory sequential mixed-methods research is to improve measurement accuracy by collecting qualitative data from selected individuals; the findings can then be tested with a wider population via quantitative research (Creswell, 2014). In this study, the objective and sensory attributes of wine were first explored using qualitative methods. The attributes identified were then fine-tuned to develop questionnaires that elicited rich quantitative insights.

The methodological approach to this research is inspired by pragmatism. A pragmatic worldview provides flexibility in the choice of methods, techniques and procedures most suitable for data collection and analysis. It also enables qualitative and quantitative data to be combined to expand knowledge of the research problem (Creswell, 2014).

4.1.1 Qualitative Design of the Pilot Study

Due to the lack of conceptual foundations for investigation of the relationship between product characteristics and consumers' WTP, exploratory interviews have been used in quality-related research on red wine (Verdu Jover et al., 2004). In this pilot study, respondents from China and France were sampled with equal proportions of low- and high-involvement consumers. A qualitative interview guide was prepared, and the sensory and objective attributes identified (listed in Appendix 1). The results are not statistically significant due to the use of a small sample ($n < 30$). However, this was not expected to cause problems, because the purpose of the pilot study was to expand the list of product attributes investigated. In addition, small samples are common in qualitative research.

A phenomenological approach was used to elicit information from the wine consumers on the significance of each wine attribute to consumers' WTP and

their preference for domestic wine to imported wine. The interviews were semi-structured, allowing consumers with diverse knowledge backgrounds to express themselves freely and share their experiences in a protected environment (Savin-Baden & Major, 2013). The respondents were allowed to make comments and indicate objective and sensory attributes additional to those mentioned in the pre-set questions. Efforts to establish a close connection and rapport with the interviewees were aided by the author's background as a Wine and Spirit Education Trust Level Three holder (completing the final stage of Level Four at the time of the interviews) and hands-on experience of business communications and networking. These qualities are thought to enable reflexivity and to strengthen the interview process. The author is also well equipped to respond to the consumers' queries and to interpret their preferences.

The general process of data analysis has been adopted from Creswell (2014) (Figure 4.2). The collected data have been organised, read and coded by meaning and by topic. Special attention has been paid to unusual information.

The data collected in the pilot study were coded for two purposes: to fine-tune the questionnaire by expanding the list of attributes investigated; and to identify patterns for the benefit of subsequent quantitative analysis.
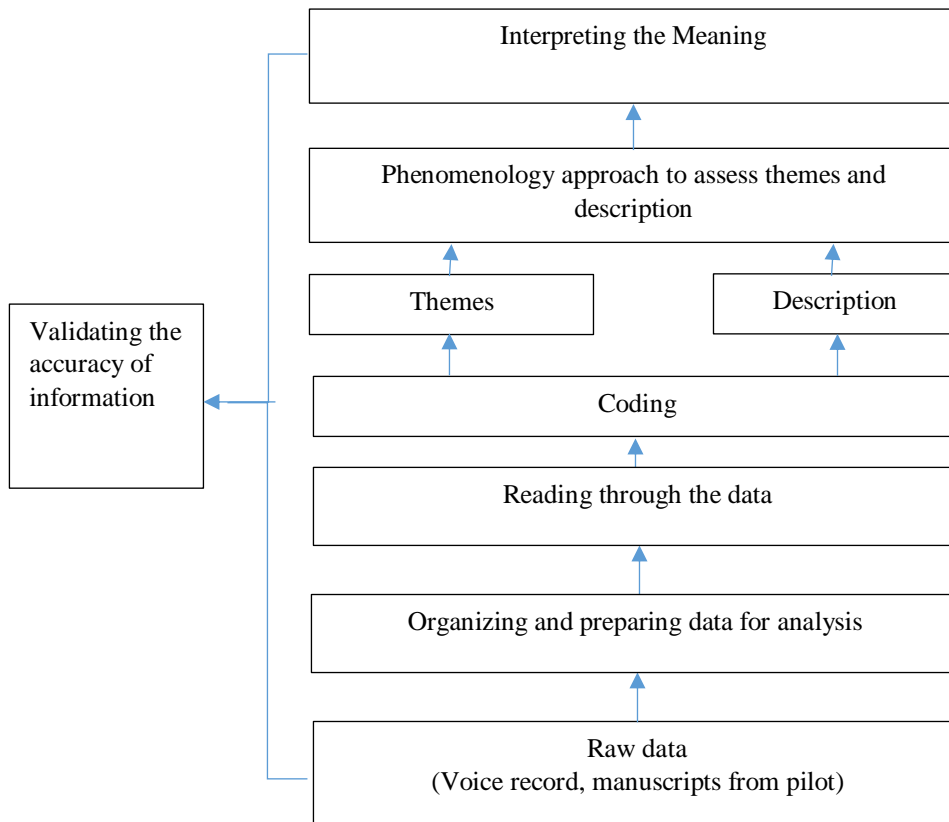
Figure 4.2: Data Analysis in the Pilot Study

4.1.2 Quantitative Design of the Main Study

To gain a holistic view of consumers' price determinants, to test the hedonic-pricing theory, and to enable statistical comparison of cultural differences, the main study was designed to be an experimental investigation of the preferences of wine consumers. To facilitate the consumers' expression of their WTP and preferences during tasting, they were required to complete questionnaires at the time of the tasting. The literature review indicated that Chinese wine consumers are less able than French wine consumers to talk about wine attributes without tasting, due to their lack of knowledge of wine (Breidert et al., 2006; Li & Bardaji, 2016). Therefore, a questionnaire was combined with a tasting experiment. Conjoint analysis in an auction setting has been shown to be ineffective due to

the time and resources required, and unsuitable for inexperienced respondents (Lange et al., 2002). In addition, only a small amount of information can be studied by conjoint analysis, whereas this research was designed to capture the maximum number of attributes that may affect consumers' price perceptions. Focus groups involve small panels of consumers, and are deemed limited in representing the general preferences of wine consumers (Combris et al., 1997; Marks, 2015). Therefore, focus groups were ruled out for this study. To gain insights into individual consumers' preferences, the tasting experiment was designed to separate two key types of product factor, sensory and objective, and their respective influences on wine consumers' preference or WTP. In line with the research objectives presented above, data were collected in different information settings following a well-established protocol (Bazoche et al., 2008; Lange et al., 2002; Song et al., 2015; Stefani et al., 2006). None of the informants in the pilot study were involved in the main study, as recommended (Creswell, 2014).

4.2. Pilot Study

4.2.1 Methodology

Content analysis is considered a suitable method of assessing the significance of and correlations between product features in consumer research (Kassarjian, 1977). Using an interview guide, face-to-face interviews with the French informants were conducted by the author in natural settings in Bordeaux and Burgundy between May and June 2016. In June 2016, telephone interviews were conducted with Chinese informants from Beijing, Shanghai, Shenzhen and Guangzhou. The 14 informants (see Table 4.1) were a mix of wine professionals, industry practitioners and students. They first answered questions regarding

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what they like about wine. Then, they were asked about their preference in relation to the objective and sensory factors of wines. Informants were allowed to make comments during the interview. They were allowed to express themselves by speaking and writing in French, or Mandarin. Demographic details and the respondents' respective wine industry background were documented for subsequent coding. Each interview lasted 20-45 minutes. Notes were taken during the interviews and all the interviews were voice recorded. After the interviews, content analysis of the data was used to extract themes and patterns, and to interpret the views of the respondents. Below, quotations from respondents are given to illustrate the findings.

Table 4.1: Descriptive statistics - pilot study

Code	French respondents from	Job nature	Year of drinking	High or low-involvement
A	Bordeaux	Travel agent	30	Low
B	Bordeaux	Owner of a Chateau	Over 40	High
C	Bourgogne	Wine shop, sales and purchasing	12	High
D	Bourgogne	Part-time sommelier	18	High
E	Bourgogne	Banker and university professor	4	Low
F	Bourgogne	English teacher	35	Low
G	Bourgogne	University international office executive	25	Low
Code*	Chinese respondents from	Job nature	Year of drinking	High or low-involvement
2	Shenzhen	Wine importer, sales and marketing	5	High
3	Shanghai	Wine importer, sales and marketing	7	High
4	Shenzhen and Xian	Managing director for bottled water	10	Low
5	Shenzhen	Banker	10	Low
6	Guangzhou and Shenzhen	Wine education executive	5	High
7	Shanghai	5-star hotel sommelier and wine director	20	High
8	Guangzhou	MNC Business Development manager	12	Low

*Code 1 – for consistency, the preliminary interview result with a Chinese respondent from Hong Kong was subsequently removed.

4.2.2 Data Analysis

All informants had a minimum of four years and a maximum of 40 years of wine consumption experience (see Table 4.1). A significant difference in wine experience was observed between Chinese and French consumers: the Chinese informants had an average of 10 years of wine experience, compared with 23 years for the French informants.

The average WTP for wine, measured by price, was RMB241/€31.8 for the Chinese respondents and RMB170/€22.5 for the French respondents (Table 4.2). The average maximum WTP of the Chinese wine consumers was RMB8,372/€1,105.9, and that of the French consumers was RMB1,396/€184.4.

Table 4.2: Summary of pilot respondents' WTP

Chinese* respondents	Involvement level	Year of drinking	Frequency of drinking	Average wine price (RMB)	Max WTP (RMB)	Difference (RMB)	5 most important attributes as ranked by the respondents	
							Objective	Sensory
2	HIGH	5	4	450	30,000	29,550	2	3
4	HIGH	10	5	381	848	467	1	4
7	HIGH	20	5	212	25,424	25,212	0	5
3	LOW	7	5	200	300	100	3	2
5	LOW	10	1	125	200	75	4	1
6	LOW	5	4	150	986	836	3	2
8	LOW	12	2	169	848	679	3	2
All	Average	10	-	241	8,372	8,131	-	-
French respondents	Involvement level	Year of drinking	Frequency of drinking	Average wine price (RMB)	Max WTP (RMB)	Difference (RMB)	5 most important attributes as ranked by the respondents	
							Objective	Sensory
B	HIGH	40	5	254	5,220	4,966	1	4
D	HIGH	18	3	112	597	485	2	3
A	HIGH	30	4	101	783	682	0	5
C	HIGH	12	4	410	1,119	708	4	1
E	LOW	4	4	186	1,492	1,305	3	2
F	LOW	35	5	45	373	328	3	2
G	LOW	25	1	82	186	104	3	2
All	Average	23	-	170	1,396	1,225	-	-

Exchange rate: RMB@7.57 to €@1 (9 May 2016), HK$@1.18 to RMB@1, HK$@8.8 to €@1, RMB@6.57 to US$@1 (16 Jun 2016)
Frequency: 5=everyday; 4=alternative day; 3=weekly; 2=2 times a month; 1=once a month
Ranked: indicates, out of 5, how many are in the sensory category, how many are in the objective category
*Code 1 – for consistency, the preliminary interview result with a Chinese respondent from Hong Kong was subsequently removed

High-involvement wine consumers in both France and China were found to consider sensory attributes more important than objective attributes (Table 4.2, boxes). Conversely, low-involvement wine consumers in both France and China considered objective attributes more important.

Generally, the views of the Chinese informants on the relative importance of the factors were diverse. Eighteen key product-related factors were identified by the informants: price, critics' score, region of origin, label and bottle presentation, country of origin, colour, friends and family recommendations, balance, aroma, age, length, alcohol content, tannin, sweetness, wood taste, acidity, mouthfeel and smoothness. In contrast, the French informants' list was relatively concise, with only 11 important product-related factors: price, region of origin, label and

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bottle presentation, country of origin, grape variety, brand name, balance, aroma, age, length and mouthfeel.

All informants, regardless of nationality, responded positively about wine. Their responses related primarily to their sensory enjoyment of the taste, particularly the fruitiness of wine, its hedonic quality (Charters, 2006) and its linkage to relaxation, socialisation, the joy and the slight feeling of getting drunk when consuming wine.

The following patterns emerged when asked about their hedonic enjoyment of wine.

4.2.2.1 Health

Charters (2006, p.132) found that the utilitarian aspects of wine consumption were rarely mentioned by his informants, and our informants in France substantiated this observation. On the other hand, the informants in China provided a very different result, with over 50 percent of them mentioning 'health' as an important reason for them to consume wine, which is similar to an observation made by Lockshin et al. (2017). One informant considered wine to be pleasing and to calm the nerves, and to promote sleep. Another informant reflected that wine consumption was relaxing and comforting.

4.2.2.2 Social or Business Gatherings

Wine was recognised by both Chinese and French informants as a means of socialisation and networking. They enjoyed sharing wine with friends or when networking on business occasions. In particular, the nerve-calming characteristics of wine helped the Chinese informants to socialise in networking

events and business conferences. The Chinese informants felt that wine, unlike other beverages, helped them to make new friends.

French informants, on the other hand, mainly reported sharing wine with friends. For them, wine was linked to culture and region of production.

4.2.2.3 Matching Wine with Food

The topic of matching a wine with food was frequently brought up by French informants. In contrast, except for one informant in China, who was a business development manager travelling overseas on a monthly basis and working at an international research institute, the topic was rarely mentioned by Chinese informants. This might be partly because Chinese meals typically comprise many different shared dishes. Insofar as the Chinese informants did mention the matching of wine with food, this was more on the basis of the mouthfeel and the consistency of the food, rather than the ingredients of the dish.

A French sommelier shared her observation that French people will always order wine to match each of the dishes, and matching would be to the main ingredient of that dish. From her point of view, wine opens one's palate and increases one's appetite. In China, wine is perceived to clean the palate, so it prepares one for another dish rather than enhancing the enjoyment of a food as it is eaten.

A Bordeaux chateau owner gave the example of matching white asparagus with white wine, rather than with red wine, as asparagus would bring out the bitter taste of red wine.

4.2.2.4 A Wine's Region or Country of Origin

All the French informants mentioned a wine region or the history of wine. French informants would rarely consume non-French wine. There were, however, some

exceptions: informant B, who was a chateau owner and wine maker in Bordeaux, informant C, who was a wine merchant in Bourgogne, and informant D, who was a sommelier in Michelin-star restaurant, had no particular preference for only one type of wine.

Most of the French informants stated the importance of wine and grape variety, the terroir, and the region.

4.2.2.5 Wine Authenticity

Chinese informants mentioned the lack of regulation in China of vintage, content and production processes. One stated that in China wine may be diluted with water. Only one Chinese informant said that he did not worry about whether a wine was fake or not; this low-involvement informant did not normally order or buy wine himself but mainly consumed it at international events and conferences.

Many French informants mentioned purchasing a wine immediately after tasting it at a chateau, for example. They had a cellar at home that allowed them to age the wine. Some would not buy wine from a supermarket or shop, in order to ensure the provenance of the wine. Also, they would refer to the AOC (*appellation d'origine contrôlée*) information on the label to help them understand the origin of the wine. 'Genuine' wine was not a topic that was mentioned by any of the French informants during interviews.

4.2.2.6 Taste Preferences - Similarities

The Chinese informants were very similar to the French informants when talking about aroma. Many informants liked a fresh and young wine that smelled of fresh fruit. Most of the informants stated their preference for wines with a balanced acidity (i.e. a balance of sweetness and tannin). Soft and smooth wine was

generally preferred by both French and Chinese informants, whereas a wood taste was generally not preferred. Mouthfeel was the element that both Chinese and French informants agreed is linked to the matching of a food with a wine.

4.2.2.7 Taste Preferences - Differences

The list of differences between French and Chinese wine consumers in terms of their sensory preferences in relation to wine is much more extensive than the list of similarities.

Colour for the Chinese informants was largely a term for the style of wine they liked to consume. The French informants, on the other hand, discussed colour as an indicator of quality. As mentioned above (section 4.2.2.3), one French informant talked about colour as an indicator for matching the wine to a food (pairing white asparagus with white wine).

Regarding aroma, many more Chinese than French informants indicated that they prefer the aroma of a more mature wine. However, only one French informant indicated their enjoyment of mature wines. Nonetheless, French informants did use specific descriptors like 'leather' and 'earthiness' in relation to the aroma of a wine.

Most French informants did not enjoy sweetness in wine. They did, though, mention the fruity sweetness of a dessert wine, and how the sugary sweetness represents symbolically a particular region; they also mentioned the fruitiness of a wine from Bordeaux or Gervey-Chambertin, and the typical sweetness of a vintage, resulting from both weather and the cellar master's technique. On the other hand, nearly all the Chinese informants preferred some sweetness in a wine. One high-involvement informant suggested that Chinese wine consumers

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generally dislike wines with high acidity and a high tannin, while they find a smooth and sweet wine easier to accept. Another Chinese informant added that wines produced in China are made with under-ripe tannin. The level of ripeness is worth further investigation, as the same Chinese informant reported not liking wines from California. From his point of view, the reason why a wine is sweet is because of the over-ripe tannin, and it thus lacks acidity and is also fuller bodied and richer.

Nearly all the French informants did not like wine with a high alcohol content, although one informant agreed that a higher alcohol content enhances the 'structure' of a wine. In contrast, all the Chinese informants preferred wines to have a higher alcohol content; indeed, over 70 percent of Chinese informants clearly stated the alcohol content they preferred, that is, above 13 percent, and up to 15 percent.

When the Chinese informants talked about tannin, they mentioned how tannin will develop in wine. French informants were very specific in referring to ripe tannin, the smooth tannin that appears in a mature wine. They demonstrated their knowledge of wine by talking about how to distinguish harsh tannin from soft tannin, and how harsh tannin will impair the wine's mouthfeel. Another French informant related the tannin composition to the time of harvest and a difference in the vinification process.

Chinese informants felt that fruit was an important attribute of balance. While most informants agreed that balance is important, the French defined balance in relation to three sets of attributes: acidity and tannin; acidity, bitterness, tannin and alcohol; and the elegance, body and structure of the wine.

Nearly all the French informants agreed that the 'length' of a wine is key, and stipulated that a good wine will have a long finish – over 10 seconds. In comparison, only 57 percent of the Chinese informants enjoyed wines with a long finish.

Two French informants agreed that tannin will add mouthfeel to the wine. They considered Bordeaux wine in general to be medium- to full-bodied. Smoothness from the Chinese point of view meant being easy to consume without feeling sticky in the throat.

One French informant talked about how the wood integration would affect the savoury taste of Pinotage from South Africa, thereby demonstrating a knowledge of the region of origin of wine.

Although the pilot survey did not specifically ask about complexity, it is interesting to note that Chinese informants mentioned complexity when talking about their preferences. Further, over 50 percent of Chinese informants talked about enjoying a wine's 'flavour development in the glass'. Other informants used similar words, including the 'diversity' of wine, the 'complexity' of wine, the 'layers' of wine (the last meaning a wine should taste differently at the beginning of consumption, in the middle and at the end). According to these informants, these are the distinctive features of a good wine: if the flavour does not change, it is simple and boring. According to one informant, a good wine will have a primary (fruity or floral) flavour that will develop into a tertiary flavour like 'forest wood'. He suggested that such flavour development should be detectable by anyone, regardless of their wine experience.

Equally, French informants also mentioned complexity in relation to their enjoyment of wine. One informant liked to enjoy wine with a group of people so that they could discuss how the flavour changes over time. That informant enjoyed an intense flavour and a long length.

4.2.3 Discussion

This pilot study revealed several ways in which wine consumers from China and France interpret wine differently. French people have a culture of matching food with wine, and relate to the taste and their general enjoyment of wine. On the other hand, Chinese people relate wine to health and physical reasons for consuming wine. Although one hedonic motivation in both cultures was to facilitate talk with friends, only the Chinese informants mentioned making new friends as a motivation.

While Chinese informants can describe generally (Corsi, Cohen, & Lockshin, 2014) what they like and dislike (Old World, older aroma) about wine (the sensory factors), in the present study, the Chinese informants were not as knowledgeable as the French informants, who could, for example, describe specific wine regions (Bordeaux, Burgundy, Loire Valley, Pessac Leognan and Medoc) and the flavour development of a wine (from fruit to leather and earthiness). Nonetheless, the Chinese informants were very specific and detailed about liking red wines with a high alcohol content, that is, 13 percent to 15 percent. This may be due to the significant difference in wine experience between Chinese and French informants.

While the Chinese informants were often concerned about whether a wine was real or fake, this highlights the accessibility of wine for the Chinese population.

Most of the French informants were found to have easy access to wine: they had a wine cellar at home, and could directly and easily purchase wine from a winery. It is suggested that wineries and importers should focus on the logistics channels, marketing and labelling technique so as to guarantee the provenance of the wine for Chinese consumers.

The aim of the main study is to expand the scope of the pilot study, to investigate consumption behaviours, taste preferences and the reasons for consuming wine.

In the pilot study, both Chinese and French informants mentioned their enjoyment of 'flavour development in the glass'. In this context, terms such as 'flavour development', 'changes' and 'layers' used by Chinese and French informants may bear the same meaning as 'complexity', 'novelty', 'interest' and 'distinctiveness', as discussed by Amerine and Roessler (1976) and Charters (2007). It is, however, believed that the underlying substance is quite different. Professionals', wine critics' or wine judges' make a subjective judgement of quality (Amerine & Roessler, 1976). Professionals and wine critics may taste hundreds of wine a day and may not have the time to appreciate the full potential of a wine and to explain to low-involvement consumers how a wine could develop in the glass. Terms related to flavour development were not discussed by Lehrer (2007) in her review of wine vocabulary. And these terms are not discussed in wine education programmes in a systematic manner (Wine & Spirit Education Trust, 2016). A further study on the meaning and definition of flavour development is recommended, especially in relation to the Chinese and French consumers. As knowledge can promote one's ability to discover more pleasure (Bach, 2007), a study of flavour development could aid in the marketing of wine

to general consumers, in order to maximise their enjoyment of wine and to expand their wine choices, thereby benefiting the wine industry as a whole.

4.2.4 Conclusion and the Confirmed Product Attributes

The results of the pilot study are consistent with the findings of the literature reviewed. The influence of sensory and objective attributes on French and Chinese consumers' preferences and WTP is found to differ. There is also a big gap in the number of years of drinking experience between the Chinese and French wine consumers. Low-involvement consumers are found to behave differently to high-involvement consumers in terms of their sensory versus objective preferences and their WTP. WTP is found to differ markedly between the French and Chinese respondents, especially the maximum WTP. To avoid unwanted bias in the analysis, the maximum WTP question is omitted in the main study.

One of the weaknesses of the pilot study is the lack of wine-tasting. The results of the pilot thus indicate merely the historical and habitual sensory preferences of a limited group of wine consumers in China and France (Combris et al., 2009). Such a weakness is compensated for in the main study by incorporating tasting to collect consumers' preferences and WTP.

One new product attribute was repeatedly proposed by the respondents during the interviews: 'flavour development in the glass'. This sensory attribute is therefore incorporated into the hedonic-pricing model. Thus, the 13 sensory attributes of a wine are colour, aroma, acidity, sweetness, alcohol content, tannin, wood taste, balance, length, mouthfeel, smoothness, complexity, and flavour development in the glass.

4.3 Revised Hedonic-Pricing Function

Having expanded the list of product attributes, as discussed in section 4.2.4, the hedonic-pricing function developed in the previous section 3.3 is revised to give the following:

$$WTP_{i,j} = \alpha_{i,j} + \sum_{n=1}^{13}(\beta_{1,n}\,Sen_{n,i,j} + \beta_{2,n}\,Imp_{n,i} + \beta_{3,n}\,Sen_{n,i,j} * Imp_{n,i}) + \sum_{m=1}^{11}\beta_{4,m}\,Obj_{m,i,j} + \beta_5\,Fav_{i,j} + \beta_6\,Dem_{i,j} + \beta_7\,Kno_{i,j} + \beta_8\,Cond_{i,j} + \varepsilon_{i,j}$$

Equation 2

where $WTP_{i,j}$ is consumer i's WTP for wine j; $Sen_{n,i,j}$ denotes the sensory attributes of wine j; $Imp_{n,i}$ is the importance of sensory attributes to consumer i; and $Sen_{n,i,j}*Imp_{n,i}$ is the interaction effect of sensory attributes on the importance of the corresponding attributes to consumer i. Thirteen sensory attributes, n, are studied. $Obj_{m,j}$ denotes the objective attributes of wine j for consumer i. Eleven objective attributes m are studied. $Fav_{i,j}$ is a wine's country of origin, and equals 1 for the Chinese wine and 2 for the French wine. $Dem_{i,j}$ is estimated for demographic factors affecting $WTP_{i,j}$. $Kno_{i,j}$ is estimated for knowledge level of consumers affecting $WTP_{i,j}$. $Cond_{i,j}$ is a dummy variable for the tasting condition, equal to 1 for stage three and 0 for stage one and stage two under the full information condition; equal to 1 for stage two and 0 for stage one and stage three under the country of origin and region of origin information condition; and equal to 1 for stage one and 0 for stage two and stage three under the blind tasting condition. $\alpha_{i,j}$ is the intercept term, β is the parameter to be estimated and $\varepsilon_{i,j}$ is the error term.

4.4 Main Study - Data Collection Strategy

4.4.1 Sampling Respondents

To collect data to test the hedonic-pricing function a convenience sampling method was adopted in this research (Blakstad, n.d.; Kirk, 2013).

Urban consumers in tier-one or tier-two cities in China were targeted. It was expected to be challenging to find wine consumers interested in participating in a tasting experiment might last up to 40 minutes. It would also be difficult to find suitable wine glasses for the tasting sessions in China. Therefore, in China, wine consumers were recruited through local wine clubs (Gustafson et al., 2011) or wine education institutions. The tasting sessions were conducted in three urban locations, Shenzhen, Shanghai and Chengdu.

In China, according to Ng (2016b), the young drinking population, comprising individuals aged 18-29, occupies 43 percent of the total drinking population. Wine drinking has been found to increase most rapidly among millennials (Lockshin & Corsi, 2012). Wine consumption per capita in China is barely 0.3 litre per annum, as of 2005; however, per-capita urban consumption is more than three times greater, at 1 litre per annum. China is believed to have enormous potential for wine consumption, especially in major urban areas (Wang & McCluskey, 2010). Lee et al. (2009) observed that urban consumers in China have been estimated to exceed 300 million, equivalent to the total population of America. Of these consumers, those classified as urban upper middle class who drink imported wine number 48 million, a 26 percent increase from the 38 million five years ago (Wine Intelligence, 2016). This research is designed to study a sample of wine consumers to represent this population (Marks, 2015).

In France, tasting experiments were also conducted in three urban locations: Bordeaux, Burgundy and Paris. Questionnaire feedback from 280-300 respondents each was sought. A set of data for the French respondents and a set of data for the Chinese respondents have been recorded for hedonic-pricing analysis.

4.4.2 Controlled and Manipulated Variables

The manipulated variable in the experiment is the tasting condition. Consumers provided their preferences and willingness to pay in pairs for the Chinese and French wines under the three conditions: blind tasting; tasting with information on country of origin and region of origin; and tasting with full information.

4.4.3 Measurement of Involvement

The respondents were asked to self-assess their level of involvement, here framed as level of knowledge about wine (Frøst & Noble, 2002), using a seven-point Likert scale (1-7) (Lockshin, Spawton, & Macintosh, 1997). Low-involvement wine consumers are infrequent wine consumers who have little tasting experience (Solomon, 1997).

Charters (2006) used consumers' consumption patterns, purchasing behaviour and passion for wine to define consumers' involvement in wine at four levels. Related statements were included in the questionnaires:

1. Enjoy the alcohol in wine, don't have a drinking pattern, buying depends on price;

2. Taken wine course and visited wineries, drink regularly, loyal to brands, buying depends on grape variety;

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3. Enjoy going to tastings, read books and magazines about wine, drink regularly, buy new wines to try from time to time; and

4. Visit wineries and go on wine tours, taste and drink wine regularly, knowledgeable about wine and search for new products all the time, and buying is based on region of origin.

4.4.4 Choice of Wine for Experiment

Low-involvement wine consumers are assumed to have little knowledge of wine. To ensure that they were able to express their preferences clearly and accurately, it was necessary to choose wine that is easy to understand. Red wine is shown to be most widely consumed in China (Ruisha, 2016), and Bordeaux blends are the most recognisable, facilitating quality determination (Cohen, 2016; Oczkowski & Doucouliagos, 2014). Offering wine with similar characteristics has also been found to be an effective means of determining which factors are most important to wine consumers (Combris et al., 1997). The focus of this study is on consumers' preference for New World versus Old World wine (Jimena et al., 2012; Oczkowski & Doucouliagos, 2014). Whereas China lacks homogeneous still wines (Li & Bardaji, 2016), Australia has Shiraz, New Zealand has Sauvignon Blanc and Germany has Riesling, while in France there are even regional grape blends: Bordeaux in Bordeaux; Chardonnay and Pinot Noir in Burgundy; Chenin Blanc in the Loire Valley; Syrah in the Rhône region; and Grenache, Syrah, and Mourvèdre in the south of France.

As the study investigates consumption preferences rather than the price determinants of luxury goods or gifts behaviour, everyday wine was used in the experiment (Marks, 2015).

4.4.5 Control Variable – Country of Origin of Wine

Despite the rich literature on consumer preferences for wines with different countries of origin, only a few researchers in this field have conducted tasting experiments. The notable examples are an evaluation of Chinese assessments of wines from France, America and Australia (Wang & McCluskey, 2010); an evaluation of Australian assessments of wines from France, America and Chile (Veale & Quester, 2008); an evaluation of Chinese Hong Kong, Asian, American and European assessments of wines from South Africa, America, Germany, Spain and Argentina (Song et al., 2015); an evaluation of French and German assessments of wines from France and America (Combris et al., 2009); an evaluation of American assessments of wines from Australia, Chile and South Africa (Schamel, 2000); and an evaluation of American assessments of wines from Canada, France, Germany, Italy, New Zealand and South Africa (Asgari, Woods, & Saghaian, 2016). To test the influence of a wine's country of origin on consumers' preference for wine in the present study, the wines chosen to represent Old and New World wine were French and Chinese. Further, the wine consumers in France and China rated their preferences and WTP based on the same six bottles of wine (Gustafson et al., 2011, p.74).

4.4.6 Control Variable – Grape Varieties of Wine

Grape variety is found to be the feature that attracts the most divergent views between high- and low-involvement consumers (Solomon, 1997) and is one of the main control variables for this tasting experiment. Six Bordeaux varietal wines were used for the main tasting experiment.

Wine sponsors were sought for the six types of wines. By 1 April 2017, all the 234 bottles of wines had been sponsored.

4.4.7 Control Variable – Same Wine for Same Stages of Tasting

While wines were sought in Hong Kong, a significant three months was spent on logistics planning. Shipment of wines to China and France was carefully planned and executed before data collection in China in May and in France from June 2017. Table 4.3 lists the wines used in the tasting experiment.

Although the price range of the wines is wide, at between RMB97/ €12.8 and RMB412/ €54.4 they still fall into the category of 'consumption wine' rather than 'collectable wine' (Wine & Spirit Education Trust, 2016, Costanigro, Mccluskey, & Mittelhammer, 2007).

Table 4.3: Identity of wines one to six used in the tasting experiment

	Wine	Winery	Sponsor	ROO	COO	Variety	Vintage	Retail price#
1	Shangri-la Plateau A1 Cabernet Sauvignon	Shangri-la winery	MyiCellars	Yunnan	China	100% Cabernet Sauvignon	2011	RMB 97 / €12.8
2	Cuvee Kawo	Chateau Le Cleret	Kampery Group	Bergerac	France	60% Merlot, 40% Cabernet Franc	2014	RMB 198 / €26.2
3	Li's Family Reserve, Cabernet Sauvignon	Li's winery	Li's winery	Ningxia	China	100% Cabernet Sauvignon	2014	RMB 484 / €63.9
4	Prestige de Balac	Chateau Balac	Chateau Balac and Grande Food and Wines	Bordeaux	France	60% Cabernet sauvignon, 30% Merlot, 10% Cabernet Franc	2011	RMB 223 / €29.5
5	The Summit	Silver Heights	Silver Heights Winery	Ningxia	China	70% Cabernet Sauvignon, 30% Merlot	2014	RMB 412 / €54.4
6	Chateau Les Grands Chenes	Chateau Les Grands Chenes, de la Bernard Magrez	Oriental Pearl (HK)	Bordeaux	France	75% of Merlot, 24% Cabernet Sauvignon and 1% Cabernet Franc	2012	RMB 124 / €16.4

#Price from wine searcher and tao bao, exchange rate: RMB@7.57 to €@1 as on 9 May 2017.

4.5 Main Study - Questionnaire Design Strategy

The respondents involved in the tasting experiment completed a questionnaire that included items on demographic data such as gender, age, education and annual household income. Respondents' stated objective and sensory preferences of wine, wine consumption experience and wine knowledge level were collected in parts one and three of the questionnaire. Part two was designed to collection information on sensory preferences over the 13 identified variables and the WTP from the tasting of the six wines. Questions were based on a review of the literature on consumer behaviour (Table 4.4).

Table 4.4: Questionnaires design: literature reviewed

Related questions	Sources
Student vs non student preferences and WTP	Tozer et al. (2015); Wang (2011)
Wine education	Hofstede (2001); Song et al. (2015); Tozer et al. (2015)
Usual WTP for a bottle of wine	Gustafson et al. (2011); Outreville (2012); Song et al. (2015)
Maximum price paid for a good wine	Lange et al. (2002); Song et al. (2015)
Who makes purchase decision in household	Hofstede (2001); Song et al. (2015)
Frequency of consumption	Mtimet & Albisu (2007); Song et al. (2015); Tozer et al. (2015)
Pattern of consumer preferences	Bruwer et al. (2011); Charters (2006); McKinna (1987); Seghieri et al. (2007); Spawton (1991)

For a study of two cultures, attention was paid to the translation techniques (Hui & Triandis, 1985). The first draft of the questionnaire was developed in English for record purposes. It was translated by native speakers and back-translated by translation software for checking and ensuring consistency. The Chinese and French native speakers involved were doctorate-level academics who understand research process, language use and requirements. Subsequently, the accuracy of the translated questionnaires was verified by another two doctorates.

Table 4.5 details all the important changes to the questionnaire from 2016 to early May 2017. To assess the differences between the two cultures, chi-square results by level of knowledge are used to assess and tabulate respondents' consumption pattern, consumption frequency and purchase preferences.

Table 4.5: Changes to the study questionnaire

Dates	Changes	Sources
Dec 2016	First draft of questionnaire made available	
4 Apr 2017	Inclusion of Wine Trivia Quiz at the beginning of the questionnaire to assess consumers' wine knowledge.	Frøst & Noble (2002)
25 Apr 2017	7 point Likert scale self-evaluated knowledge	Lockshin et al. (1997)
28 Apr 2017	Final refinement of the language used in the Chinese questionnaire	
9 May 2017	Alignment of French and Chinese questionnaires on WTP and Income scale based on current exchange rate	
9 May 2017	French questionnaire translated	
11 May 2017	First use of questionnaire in China	
19 June 2017	First use of questionnaire in France	

For scalar equivalence (Hui & Triandis, 1985), the use of a seven-point Likert scale was adopted for consumers' preference and importance rating, and for WTP an 11-point Likert scale was adopted (Table 4.6). It covers the highest average WTP of the Chinese informants in the pilot study, at RMB450/ €59.4, the highest average WTP of the French informants in the pilot study, at RMB410/ €54.2, the lowest average WTP of the Chinese informants in the pilot study, at RMB125/ €16.5, and the lowest average WTP of the French informants in the pilot study, at RMB45/ €5.9. Further, this study used local currency, euros for France and RMB for China, for consumers' convenience. The exchange rate on 9 May 2017 between RMB and the euro is used for WTP and income figures as they appear in the questionnaires, and for data analysis.

Table 4.6: The Likert scale used for WTP in this study

Likert scale	WTP for French (Euro)	WTP for Chinese (RMB)
11	>70	>530
10	63-69.9	477-529
9	56-62.9	424-476
8	49-55.9	371-423
7	42-48.9	318-370
6	35-41.9	265-317
5	28-34.9	212-264
4	21-27.9	160-211
3	14-20.9	107-159
2	7-13.9	54-106
1	<7	<53

The questionnaire was pre-tested on 15 March 2017 by 47 respondents in a tasting experiment conducted at the School of Hotel and Tourism Management, Hong Kong Polytechnic University, following the procedure described in section 4.4.

Following the feedback from this pre-test, and the protocol suggested by Combris et al. (2009), a PowerPoint page explaining the meaning of the sensory attributes was provided to minimise personal bias and errors, especially on the part of respondents less knowledgeable about wine. In all circumstances, respondents were encouraged to ask questions during the tasting. At least one wine researcher who spoke the local language was present at the tastings with the author, to administer the questionnaire and to answer questions.

Respondents were asked to complete the questionnaire and to taste each wine individually. Wines were assessed in pairs, with each wine served in a glass (15-25ml per glass) at a temperature of $15 \pm 3°C$. To control the objective attributes, the sequence of tasting was: blind tasting; tasting with country of origin; and full information tasting. At full information tasting, a leaflet provided by the two wineries was provided to all respondents. Additional consumption information, including price for wines five and six, was provided by PowerPoint. The wine bottles of wines five and six were made available to all respondents for their

assessment on preferences and WTP. (See Appendix 2 for the full tasting protocol.)

4.6 Main Study - Data Analysis Strategy

In relevant WTP and hedonic-pricing studies, the most commonly used analytical method is ordinary least squares (OLS) regression (Bazoche et al., 2008; Cardebat & Figuet, 2004; Combris et al., 2009; Combris et al., 1997; Gustafson et al., 2016; Lange et al., 2002; Tozer et al., 2015).

Table 4.7: Quantitative data analysis: methods used

	Sources	Experimental Design	Data Analysis methods used
1.	Bazoche et al. (2008)	Stated preference - auction (Becker-DeGroot-Marschak)	WTP by information condition
	Combris et al. (2009)	Primary research (consumer)	Regression
		Instrument - questionnaire	
		Tasting of wine – by 3 information condition (blind, label only, taste and label)	(No hedonic-pricing application)
2.	Combris et al. (1997)	Revealed preference - scoring	Hedonic-pricing
		Primary research (expert / jury)	Regression
		Instrument – expert technical comments	(No WTP)
		Tasting of wine	
4.	Cardebat & Figuet (2004)	Revealed preference - scoring	Hedonic-pricing Regression
		Primary research (jury)	(No WTP)
		Blind taste only	
		Mean - wine	
5.	Tozer et al. (2015)	Stated preference - Contingent valuation (CV)	WTP
		Primary research (Consumers)	Hedonic-pricing
		Blind tasting only, wine	Regression
		Mean - Cider not wine	Mean comparison
6.	Gustafson et al. (2016)	Stated preference - auction (Becker-DeGroot-Marschak)	WTP
		Primary research (consumers)	Hedonic-pricing
		Instrument - questionnaires	Regression
		No tasting of wine	

Learning from the review of the literature noted in Table 4.7, primary data including consumers' stated preference and revealed preferences were collected in the three information tasting conditions by means of questionnaires. To enable econometric analysis of consumers' price determinants, the data collected from the experiment were recorded using the Statistical Package for the Social Sciences (SPSS) software, version 24. Descriptive statistics of the wine consumers' demographic characteristics are presented for the two models, with one Chinese set and one French set.

4.7 Main Study - Estimation Strategy

As the purpose of this research is to study consumers' price determinants for wine, mean, median comparison and OLS regression is used to perform the analysis.

4.7.1 Choosing between Parametric and Non-Parametric ANOVA

Step 1

To check whether the data were normally distributed, Shapiro-Wilk tests were first performed to compare the coefficients of variation between WTP for the wines one to six and between the three information conditions. Where WTP was normally distributed, with mean values representing the centre of distribution better than median values, parametric ANOVA was adopted to test the group means. Where WTP for wines was not normally distributed, non-parametric ANOVA was adopted instead.

To test the hypotheses, post-hoc tests (Friedman test) were first performed to assess the critical values between the WTP for the three information conditions before the hedonic-pricing analysis.

4.7.2 Estimation of the Revised Hedonic-Pricing Model

The revised hedonic-pricing model was then estimated, drawing on suggestions from Song, Witt and Li (2008) to obtain valid estimates of the parameters with the following assumptions.

Assumption 1. $E(WTP_{ij}) = \alpha + \sum_{n=1}^{13}(\beta_{1,n}\,Sen_{n,i,j} + \beta_{2,n}\,Imp_{n,i} + \beta_{3,n}\,Sen_{n,i,j} * Imp_{n,i}) + \sum_{m=1}^{11}\beta_{4,m}\,Obj_{m,i,j} + \beta_5\,Fav_{ij} + \beta_6\,Dem_{ij} + \beta_7\,Kno_{ij} + \beta_8\,Cond_{ij}$

This assumption is that the value of WTP_{ij}: $E(WTP_{ij})$ is dependent on the values of the explanatory variables and α and β are the parameters to be estimated. This is equivalent to $E(\varepsilon_{ij}) = 0$.

Assumption 2. $Var(WTP_{ij}) = Var(\varepsilon_{ij}) = \sigma^2$. This assumption is that the sample variance of WTP_{ij} or the variance of the error term remains constant over time. If this assumption did not hold, the model would exhibit heteroscedasticity. A test of heteroscedasticity of the residuals can be conducted using scatter plots.

Assumption 3. $WTP_{ij} \sim N(\alpha + \sum_{n=1}^{13}(\beta_{1,n}\,Sen_{n,i,j} + \beta_{2,n}\,Imp_{n,i} + \beta_{3,n}\,Sen_{n,i,j} * Imp_{n,i}) + \sum_{m=1}^{11}\beta_{4,m}\,Obj_{m,i,j} + \beta_5\,Fav_{ij} + \beta_6\,Dem_{ij} + \beta_7\,Kno_{ij} + \beta_8\,Cond_{ij}, \sigma^2)$.

This assumption is equivalent to $\varepsilon_{ij} \sim N(0, \sigma^2)$. The mean values of the dependent variable are not normally distributed by nature.

Assumption 4. The values of the explanatory variables are known, and there are no linear relationships between the explanatory variables. If this condition is not met, the model will exhibit multicollinearity. Variance inflation factor (VIF) is

used to identify multicollinearity in the independent variables. VIF should be less than 10.

All these assumptions are made and it is further assumed that the estimated values of the α and β parameters generated by OLS in the hedonic-pricing function are the best linear unbiased estimates of α and β.

The results of OLS estimation is presented for the coefficients in Equation 2, for the two sets of data (The Chinese and the French), for the 24 sensory and objective attributes, for the importance of the sensory and objective attributes, and for the interaction of the 13 sensory attributes. Results for WTP regressions are descriptively reported. The goodness of fit, R^2, was estimated (see Tables 6.1 and 6.2) to determine the extent to which variation in the results can be explained by the model. R^2 ranges between 0 to 1 and indicates the connection between dependent variable and the explanatory variables. The variables are highly positively related if R^2 is to closer to 1 (Gujarati, 1978).

The adjusted R^2 used here for comparison of the French and Chinese models, due to differences in the number of independent variables in the hedonic-pricing equation (Studenmund, 2017). Further, the respective explanatory variables are presented in the estimated coefficients table (see Tables 6.1 and 6.2), with the estimated coefficients, t-ratio, VIF and the adjusted R^2 for the Chinese and French respondents.

4.8 Hypothesis Testing and Specification

In testing the model, it is possible that the OLS estimators are biased, inconsistent, inefficient and nonlinear; i.e. the OLS estimators are not BLUE. The following test of the model and remedial measures are suggested for dealing with heteroscedasticity and multicollinearity.

The Goldfeld-Quandt test is employed to decide between the linear and log-linear forms. If the linear model had a high degree of heteroscedasticity, the log-linear form was instead chosen for the estimation and applied to all non-dummy variables for Equation 2 for the Chinese and French data (Schamel, 2000).

Further, as identified by Gujarati (1978) and Nagler (1999), if the model included an irrelevant variable, the estimated standard errors can be inefficient and subject to heteroscedasticity. From the literature, different knowledge levels of wine consumers will generate different WTPs; therefore, heteroscedasticity is expected. The predicted WTP was derived for each respondent, and the parameters of the new model were estimated. Following Anderson, Sweeney, Williams, Camm, and Cochran (2008), the F-test of overall significance was conducted (H_0: $\beta_1 = \beta_2 = \ldots = \beta_8 = 0$, Ha: One or more of the parameters was not equal to 0), based on the following rejection rule, p-value approach: reject H_0 if p-value $\leq \alpha$; α is set at the 5 percent level of significance conventionally. In the case of heteroscedasticity, the estimators lack efficiency and are not of minimum variance, and will result in a widened confidence interval with a weakened test of significance. In such case, instead of OLS, weighted least squares (WLS) will provide BLUE estimators to perform the analysis (Gujarati, 1978).

Because some of the explanatory variables are closely linked logically, multicollinearity will naturally exist in the model. At the same time, there can also be inconsistencies in individual β parameters. A high correlation of determination R^2 indicates a close linear relationship between the explanatory variables, which makes the interpretation of the t-test results on the individual parameters difficult, due to weak statistical significance. High multicollinearity can be detected when regressing the explanatory variables against each other (correlation matrix from SPSS) by comparing the correlation coefficient and VIF (the explanatory variables appear to be collinear when both the correlation coefficient and VIF is high). To deal with such a problem, the model can be re-specified, with the redundant explanatory variables dropped (Gujarati, 1978). To avoid specification bias from dropping of a variable, Oczkowski (1994b) demonstrated that with factor analysis some variables (here the objective attributes and sensory attributes) can be combined to reduce the number of individual regressors. The interaction terms for sensory attributes should be included only if statistical significance reaches 10 percent or more. Further, using general-to-specific modelling (Song et al., 2008; Song et al., 2015), only the attributes that are statistically significant are retained among the explanatory variables that contribute to the final Chinese and French hedonic-pricing models.

In the event that it is more desirable to retain all the explanatory variables to explain the model and preferences of wine consumers, one could choose to exclude the marginal effects, i.e. not make inferences on the individual β parameters if the model exhibits multicollinearity.

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Chapter 5. Data Analysis

5.1 Data Summary

5.1.1 Chinese Respondents

Three hundred and three wine consumers were recruited from the following tier-one cities (see Table 5.1), for the tasting experiments in China in May 2017. Chengdu was promoted from tier-two to tier-one in May 2017 according to a China Business Network weekly magazine report (China Daily, 2017).

Table 5.1: Venues for Chinese data collection (n=303)

Code	Cities	Supporting organisations	Wine consumers' profiles
1	Chengdu n=67 (22.1%)	**M5 lifestyle club** – located in a newly developed luxurious apartment area in Chengdu. W hotel is under developed in Yu Peak.	Members of a millionnaiers club, who owned serviced-apartments in Yu Peak.
		Domaine – WSET registered wine educator in Chengdu	Members of Domaine included wine importers, sommeliers and WSET level 1 to 3 learners in Chengdu.
		Shi Yun Advertising Co. Ltd – specialised in the China Food and Drinks fair	Staff of Shi Yun Advertising
2	Shanghai n=110 (36.3%)	**Shun Hing Group** – importer of wine cabinets (Vintec and Transtherm) and the experiment is conducted in WSET registered centre location in Shanghai.	Clients and Members who are invited by Assistant General Manager, Mr Yip of Shun Hing Group to join the tasting experiment
		Shanghai Normal University	Staff, Alumni and students
3	Shenzhen n=126 (41.6%)	**Aroma Republic** – lifestyle club and WSET registered wine educator in Shenzhen	Members of Aroma Republic included wine makers, importers, sommeliers and WSET level 1 to 3 learners in Shenzhen.
		Shenzhen Blind Tasting social club	Connection of Prof Ann Li of Jinan University
		Shenzhen Jinan University	Staff, Alumni and students

Table 5.3 below displays the demographic information of the Chinese respondents (following Table 5.2 regarding venues for French data collection). Females made up 67 percent of the Chinese sample. In comparison, the total population by gender is 49 percent female (National Bureau of Statistics, 2016).

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There is an over-representation of females in this sample due to the female interest in joining wine experiments. Li et al. (2011) found more interest in future wine consumption among women than men. This higher percentage of females is therefore likely to be a reflection of the wine-drinking population in China. It is not uncommon for wine research to have a higher proportion of females (Stefani et al., 2006; Tozer et al., 2015). The main age categories surveyed were 18-20 years old, at 38 percent, and 21-30 years old, at 36 percent; the mean age was 30.2. This sample resembles an age segment similar to that researched by Camillo (2012). Of the Chinese sample, 27 percent did not have a university degree, 65 percent were university graduates, and 12 percent had a masters degree or higher education. The highly educated background of the respondents is similar to that of Liu et al. (2014) and Balestrini and Gamble (2006). The education bias is a control factor, as 50 percent of the data were collected in wine education institutions. The sample is likely to represent the future demand (Yu et al., 2009) and the wine-drinking population, but not the general population – for instance, less than 15 percent of the general population have a university or higher degree (National Bureau of Statistics, 2016b). About 37 percent of the respondents did not want to reveal their family income. For the other 63 percent, the numbers are evenly spread across the 11 categories, with a mean and median household income at RMB 96,600 to 120,699 / €12,800 to 15,999 per annum. The sample is representitive and is consistent with the population statistics from the National Bureau of Statistics (2016a). The average wage of an employed person is RMB 62,029/ €8,194 per annum for 2015, with an household size between two and three. Compared with the younger general population in China, the sample had a higher mean income, i.e. representing the

upper middle class. The current mean salary of young graduates above age 21 is between RMB 33,600 and 54,000 / €4,440 and 7,130 per annum (OECD 2015, p.40). The slightly higher household income of the sample may partly be because the data collection was in tier-one urban locations rather than rural locations.

5.1.2 French Respondents

Two hundred and eighty wine consumers were recruited from Burgundy, Bordeaux and Paris, for the tasting experiments in May and September to December 2017 (see Table 5.2).

Table 5.2: Venues for French data collection (n=280)

Code	Cities	Supporting organisations	Wine consumers' profiles
4	Bordeaux for n=113 (40.3%)	**Airbnb host**s	The hosts of Airbnb in Bordeaux who invited friends to join tasting.
		Bordeaux University	Supported by Linhao Shao of Kedge and Linda Jiao of Bordeaux University who invited friends from social media to join tastings at Kedge Business School.
		Kedge Business School - leading business degree (non wine related) and master degree provider in France for wine business and wine management programmes.	French staff members and students of school by invitation.
5	Burgundy for n= 133 (47.5%)	**Paquet** – a building and construction company in Dijon.	Staff members and enginneers from Paguet, supported by Didier Faussot.
		CHU Hopital	Supported by Sead Jazayeri, who invited surgeons and nurses from the heart vassel operation theater to join the tasting.
		ASPTT Tennis Club	Supported by Aline Jazayeri, who invited staff and members of the tennis club to join the tasting.
		Japanese cooking class in Dijon	Supported by Violaine Malapert, who invited classmates to join the tasting.
		Burgundy Business School – WSET registered wine educator in Burgundy, leading business degree (non-wine-related) and master degree provider in France for wine business and wine management programmes.	Staff members and students of Burgundy Business School by invitation. Polarised knowledge of respondents, including oenologist, exporter, sommeliers and WSET level 1 to 3 learners in Burgundy.
6	Paris for n=34 (12.1%)	**Ballroom dancers** – a lifestyle club members.	Linda Huom Lui invited French ballroom dancers to join the tasting.
		Wilson's Disease supporting group in France and Paris	Supported by Stephanie Vacherot, who invited members to join tasting at Ibis Hotel.

Table 5.3 below displays the demographic information and wine experience data of the French respondents. An equal percentage of each gender, 50 percent, is included in French sample, which is similar to Insee's (2017) latest gender figures. The main age categories in the sample are 21-30 years old, at 55 percent, and 31-40 years old, at 13 percent (Figure 5.1); the mean age was 39.2. Again, this is similar to Insee's (2017) latest figures, with a mean age of 41.4. Of the French sample, 11 percent did not have an university degree, 27 percent were university graduates and 67 percent had a masters degree or higher education. Approximately 44 percent of the French general population have a higher education degree (Insee, 2016). This sample therefore has an over-representation of the highly educated group. The education bias is a control factor as 50 percent of the data are collected in wine education institutions. Again, the sample is likely to represent the future demand (Yu et al., 2009). About 21 percent of the respondents did not want to reveal their family income. For the other 79 percent, the mean income was RMB 120,700 to 144,799/ €16,000 to 19,199, median income RMB 144,800 to 180,999/ €19,200 to 23,999 per annum, mode income RMB 241,400 to 482,799/ €32,000 to 63,999 per annum (Figure 5.2). The sample demonstrates a slightly lower mean income, as, according to an OECD report, the average French salary is approximately RMB200,079/ €26,430 per annum (OECD, 2015a). The cause of the mis-representation is the high percentage of wine master students.

Table 5.3: Demographic characteristics of the respondents

		Cultural group			
		Chinese		French	
		N	%	N	%
Gender	Male	101	33.3	139	49.6
	Female	201	66.3	141	50.4
	n/a	1	0.3	0	0
Age	18-20	115	38.0	9	3.2
	21-30	109	36.0	155	55.4
	31-40	47	15.5	36	12.9
	41-50	21	6.9	32	11.4
	51-60	8	2.6	26	9.3
	over 60	2	0.7	22	7.9
	n/a	1	0.3	0	0
Education level	No university degree	71	23.4	32	11.4
	Studying, or with university degree	193	63.7	58	20.7
	Master, PhD or higher	35	11.6	188	67.6
	n/a	4	0.3	2	0.7
Income level (RMB)	Below 12,100	21	6.9	40	14.3
	12,100 – 36,199	35	11.6	11	3.9
	36,200 – 60,399	15	5.0	7	2.5
	60,400 – 96,599	22	7.3	26	9.3
	96,600 – 120,699	18	5.9	12	4.4
	120,700 – 144,799	13	4.3	6	2.1
	144,800 – 180,999	12	4.0	11	3.9
	181,000 – 241,399	19	6.3	21	7.5
	241,400 – 482,799	19	6.3	47	16.8
	482,800 - 964,299	12	4.0	33	11.8
	964,300 or above	5	1.7	8	2.9
	n/a	112	37.0	58	20.7
Total		303		280	
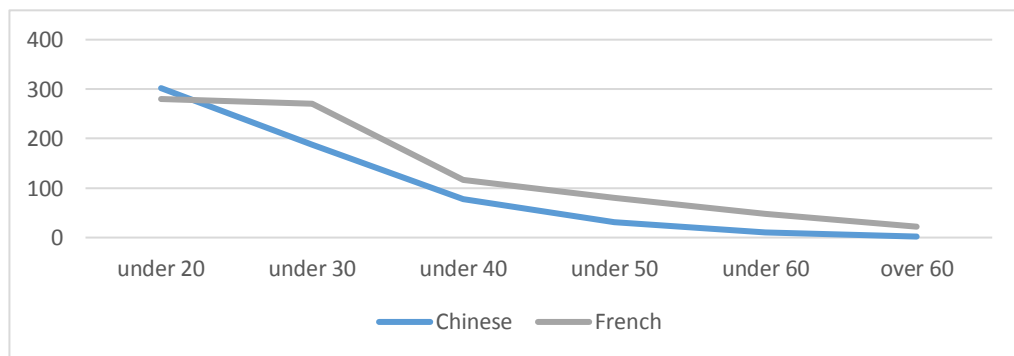
Figure 1.1: Cumulative Distribution Function For Wine Consumers, by Age
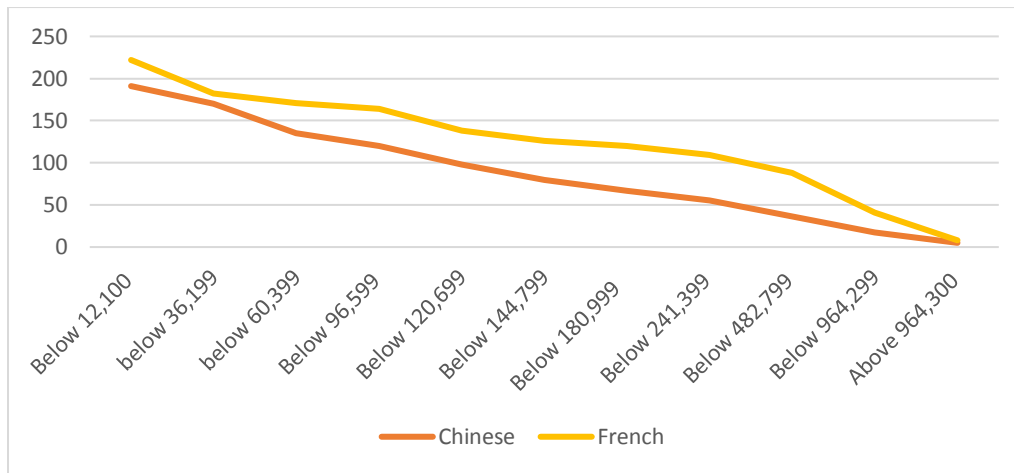
Figure 5.2: Cumulative Distribution Function, by Income (RMB)

5.2 Consumption and Purchasing Habits

5.2.1 Chinese Respondents

The mean expenditure on a bottle of wine is RMB225 / €29.7, with median and mode both at RMB200 / €26.4. This average wine expenditure per bottle is similar to the WTP results of Camillo (2012) and Ng (2016b). The wine experience of the Chinese respondents ranged from 0 to 42 years, with a mean at 4.9 years (Table 5.4). Fifty-eight percent of Chinese respondents were wine educated; however, only 27 percent worked in the wine industry. Up to three-quarters of the respondents were concerned about the country of origin (80 percent) and region of origin (68 percent) when they chose a wine.

These Chinese respondents did not consume very much, but when they did so they usually drank wine with other people; most respondents, 48 percent, consumed wine with two to four people (Figure 5.3). They also did not finish a bottle at just one meal, with 74 percent consuming less than one bottle during a meal (Figures 5.4 & 5.5). Of the Chinese respondents, seventy-two percent considered matching food and wine; 64 percent (with median at 70 percent, mode at 80 percent) usually consumed wine with food.

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Most of these respondents purchased wine not on a monthly basis but on a yearly basis (Figure 5.6). Nearly 27 percent purchased less than one bottle a month, with an average purchase of 2.7 bottles of wine a month (with median and mode at one bottle a month). This sample mean is much higher than the OIV (2016) result, which is merely 2 litres per person annually in 2012.

Table 5.4: Descriptive statistics for the Chinese and French respondents

Descriptive statistics	Respondents	N	Min	Max	Mean	SD
Wine age (years)	Chinese	303	0	42	4.90	5.905
	French	280	2	60	16.49	12.129
Usually expenditure on a bottle of wine (RMB)	Chinese	287	0	2000	227.98	186.949
	French	280	0	349	105.26	51.613
Monthly purchase per household (bottle)	Chinese	273	0	50	2.64	4.985
	French	277	0	40	6.66	5.730
Consume wine with food (%)	Chinese	301	-	-	64.38	-
	French	276	-	-	71.62	-

Regarding consumption and purchase patterns (Table 5.5), there is no distinctive wine purchase experience for Chinese respondents. There is a roughly equal split between respondents who buy dependent on price (29 percent), who buy dependent on grape variety (27 percent) and those who actively search for new products (26 percent) (Figure 5.7). Regarding wine consumption experience, the overall sample was fairly evenly split between new wine drinkers - 41 percent of whom said they enjoy the alcohol content but identify themselves with no drinking pattern - and wine connoisseurs - 38 percent of whom enjoy the consumption of wine, and who taste and drink frequently (Figure 5.8). Of the Chinese respondents, 81 percent had not previously visited a winery (Figure 5.9).

The item added further to the pilot test, 'flavour development in the glass' (Table 5.6) attracted attention and 79 percent of the Chinese respondents agreed that it is not the same as 'complexity'.

Table 5.5: Respondents' wine consumption patterns and purchase behaviours

	Cultural group			
	Chinese		French	
	N	%	N	%
How many person to drink together (χ2 =86.918 df=4, sig=0.000)				
drink alone	14	4.7	4	1.5
1 person	13	4.3	29	10.7
2-4 person	143	47.8	198	73.1
5-10 person	65	21.7	39	14.4
More than 10 person	64	21.4	1	0.4
Total	299	100	271	100
How long to finish a bottle of wine (χ2 =93.694, df=5, sig=0.000)				
within 2 hours	46	15.3	119	43.3
2-4 hours	67	22.3	55	20.0
more than 4 hours, less than 1 day	24	8.0	18	6.5
1-2 days	50	16.6	53	19.3
More than 2 days	30	10.0	20	7.3
never had a bottle of wine before	84	27.9	10	3.6
Total	301	100	275	100
How many bottles for a meal (χ2 =242.453, df=5, sig=0.000)				
less than 1 bottle	224	74.4	47	16.8
1 bottle	46	15.3	75	26.9
2 bottles	15	5.0	119	42.7
3 bottles	3	1.0	33	11.8
4 bottles	1	0.3	5	1.8
more than 4 bottles	12	4.0	0	0
Total	301	100	279	100
Frequency of consumption (χ2 =118.725, df=3, sig=0.000)				
less than once a month	101	33.7	9	3.2
more than once a month, less than once a week	93	31.0	59	21.1
more than once a week	84	28.0	167	59.9
usually everyday	22	7.3	44	15.8
Total	300	100	279	100
Wine purchase behavior (χ2 =62.067, df=3, sig=0.000)				
Buy depends on price	86	28.8	49	17.8
buy depends on grape variety	82	27.4	24	8.7
buy to try new products	53	17.7	110	40.0
search for new products and buy based on ROO	78	26.1	92	33.5
Total	299	100	275	100
Wine consumption experience (χ2 =66.273, df=3, sig=0.000)				
enjoy alcohol, no drinking pattern	121	40.6	57	20.7
drink regularly and loyal to brands	34	11.4	15	5.4
drink regularly and go to tasting	31	10.4	100	36.2
taste and drink frequently	112	37.6	104	37.7
Total	298	100	276	100
Winery visit experience (χ2 =328.755, df=3, sig=0.000)				
no visit to winery before	243	80.5	15	5.5
visited winery before	27	8.9	127	46.2
read books and magazines, and visited wineries	19	6.3	62	22.5
knowledgeable, visited wineries, on wine tours a lot	13	4.3	71	25.8
Total	302	100	275	100
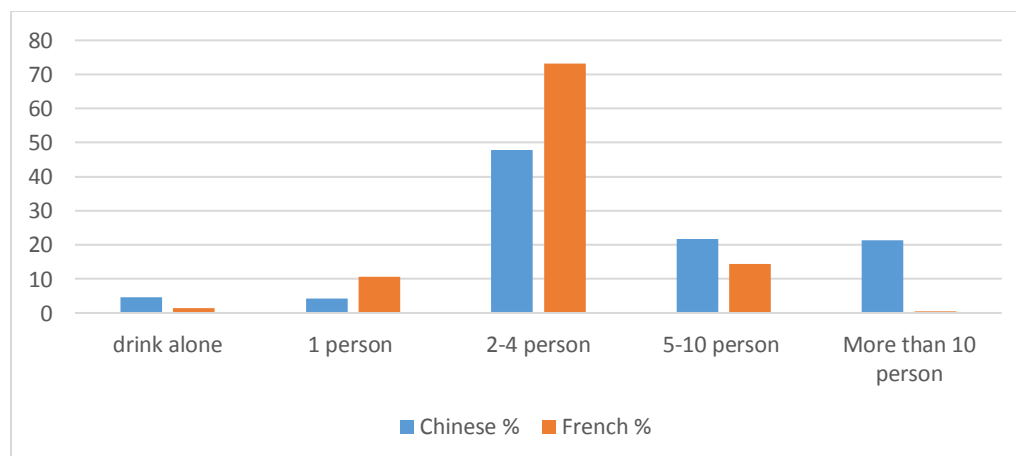
Figure 5.3: How Many Persons Drink Together
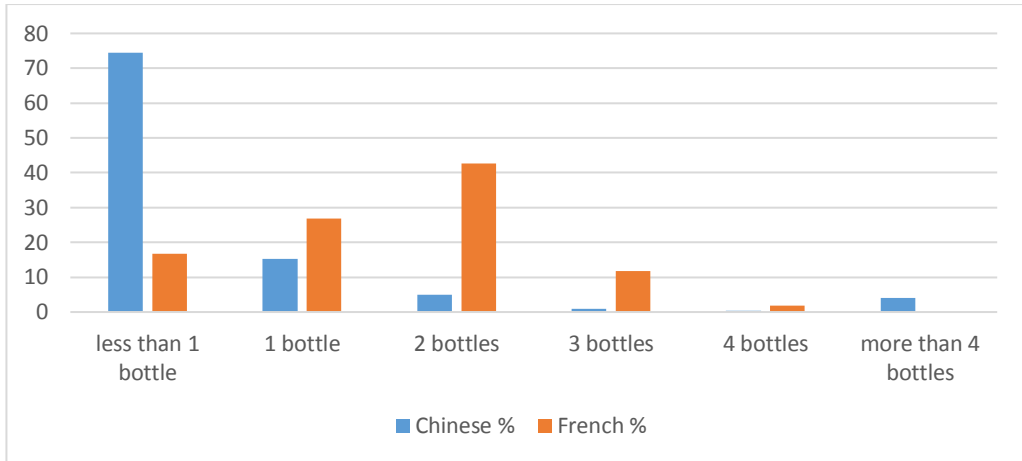
Figure 5.4: How Many Bottles for a Meal
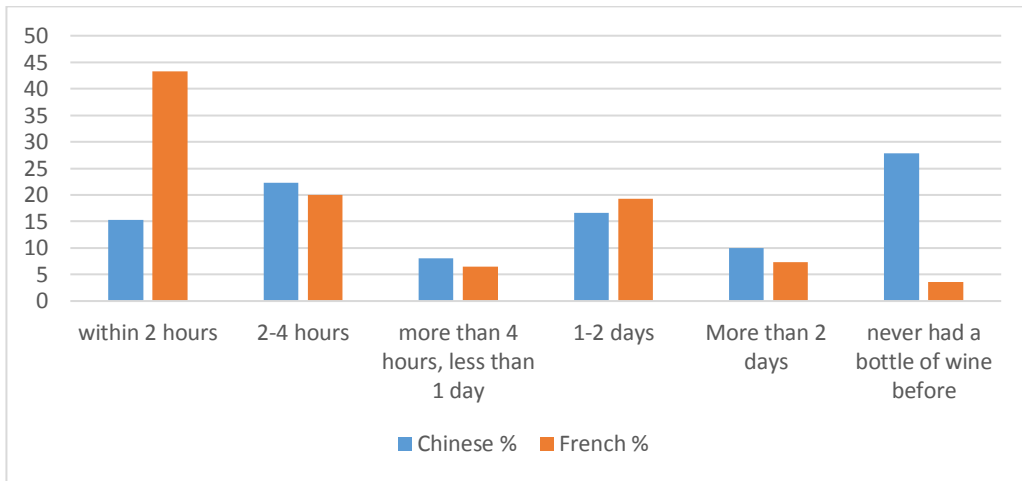
Figure 5.5: How Long to Finish a Bottle of Wine
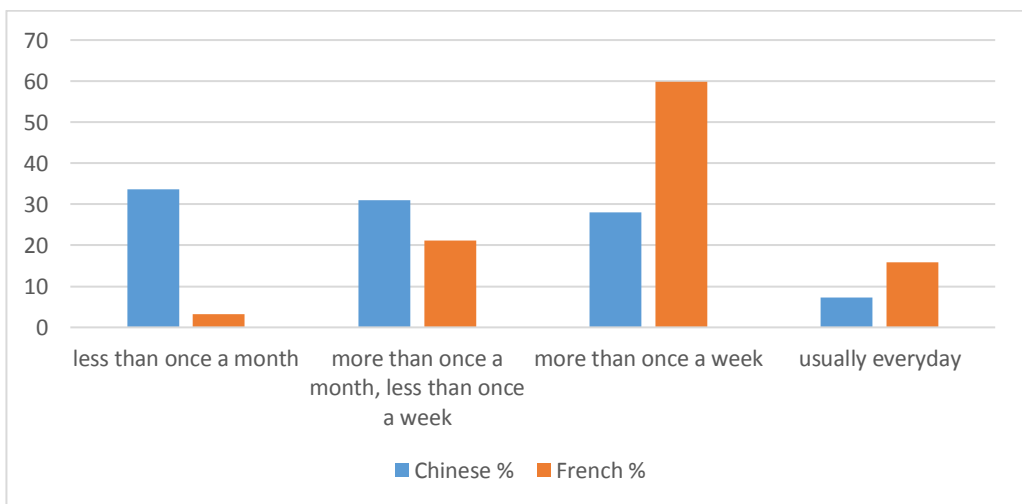
Figure 5.6: Frequency of Consumption
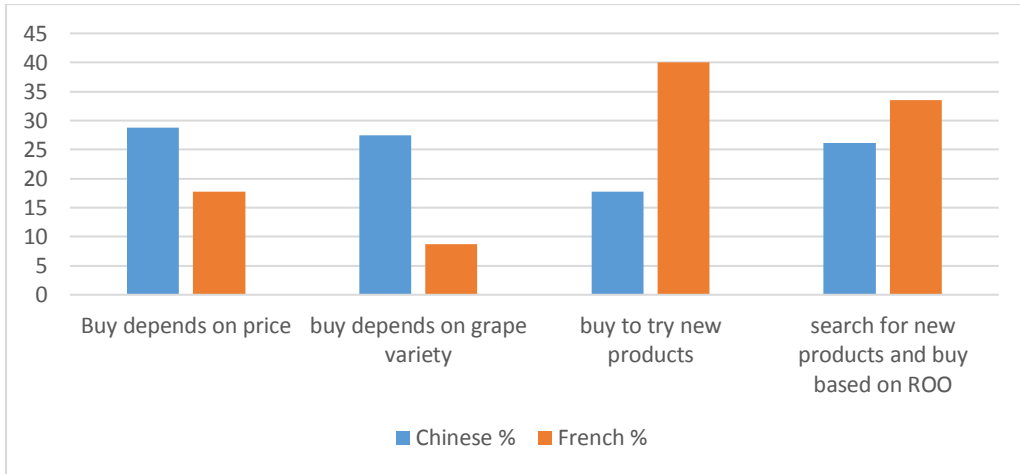
Figure 5.7: Wine Purchase Behaviour
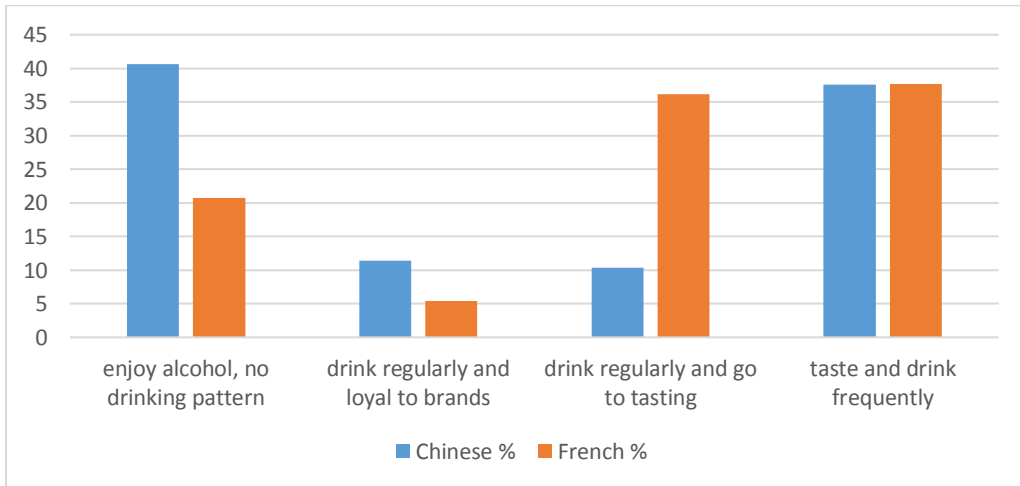
Figure 5.8: Wine Consumption Experience
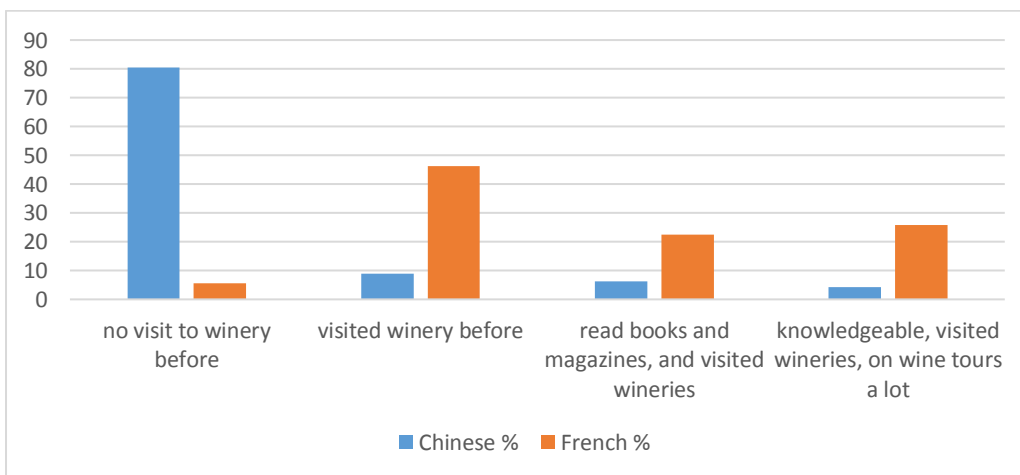
Figure 5.9: Winery Visit Experience

Table 5.6: Respondents' wine background and behaviour preferences

		Chinese		French	
Results		N	%	N	%
Wine educated	Yes	175	58.1	111	39.6
($\chi2$ =19.856, df=1, sig=0.000)	No	126	41.9	169	60.4
wine industry involvement	Yes	82	27.2	107	38.5
($\chi2$ =19.856, df=1, sig=0.000)	No	220	72.8	171	61.5
Choose a wine by country of origin	Yes	242	80.1	271	96.8
($\chi2$ =38.559, df=1, sig=0.000)	No	60	19.9	9	3.2
Choose a wine by region of origin	Yes	205	67.9	268	95.7
($\chi2$ =73.950, df=1, sig=0.000)	No	97	32.1	12	4.3
Consider food and wine matching	Yes	219	72.3	263	93.9
($\chi2$ =47.629, df=1, sig=0.000)	No	84	27.7	17	6.1
Flavour development same as complexity	Yes	64	21.2	33	12.4
($\chi2$ =38.559, df=1, sig=0.000)	No	238	78.8	234	87.6

5.2.2 French Respondents

The average expenditure on a bottle of wine was RMB105/€14, with the median at RMB93/€12.3 and mode at RMB113/€14.9. This represents a 'super premium' range (Chiodo, Casolani, & Fantini, 2011; Bazoche et al., 2008). The wine experience of the French respondents ranges from 2 to 60 years, with a mean at 16.5 years (see Table 5.4), which is more than three times that of the Chinese respondents. Only 40 percent of French respondents were wine educated, of whom 39 percent worked in the wine industry. Nearly all the respondents considered the country of origin (at 97 percent) and region of origin (96 percent) when they chose a wine. The French respondents' average purchase was up to 6.7 bottles of wine a month. The sample is a true representation of the wine-drinking population and similar to the OIV (2016) result, which is up to 89 bottles per capita per annum.

The French respondents consumed more than the Chinese respondents and also enjoyed wine consumption with other people. Most of the respondents, up to 73 percent, consumed wine with two to three people. Of the French respondents, 43 percent finished a bottle within two hours, and 43 percent consumed two bottles during a meal.

Of the French respondents, 94 percent considered matching food and wine and 72 percent usually consumed wine with food (median and mode both 80 percent). Regarding wine purchase experience, the French respondents can be seen to be more experienced than the Chinese respondents; 40 percent were interested in buying and trying new products and were eager to search for new product. Purchase for them depended on region of origin rather than simply on country of origin (34 percent).

Regarding wine consumption experience (Table 5.5), a much higher percentage of French respondents (74 percent) enjoyed wine, tasted and drank wine frequently, and participated in tasting events from time to time. Very few of the French respondents had never visited a winery before (6 percent). The French respondents demonstrated passion about wine, read about it, visited wineries and went on wine tours frequently.

In relation to 'flavour development in the glass' (Table 5.6), more French than Chinese respondents, up to 88 percent, agreed that 'flavour development in the glass' is not the same as 'complexity'.

5.3 WTP for the Six Study Wines

5.3.1 Chinese Respondents

From the 303 respondents from China, the WTP for wines one and two, under the blind tasting condition, were 2.79 and 2.93 (RMB148/ €19.6 & RMB155/ €20.4) (see Table 5.7). The WTP for wines three and four, under the tasting condition with country of origin and region of origin information were 3.56 and 3.64 (RMB189/ €25.0 & RMB193/ €25.5). The WTP for wines five and six, under the tasting condition with full information were 5.16 and 3.39 (RMB273/

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€36.0 and RMB180/ €23.8). Chinese wine consumers' WTP for the wines increased when more objective information was progressively provided in the tasting.

Table 5.7: Chinese WTP for the six study wines

Tasting conditions	Wine	Mean WTP (Likert scale)	Median WTP (Likert scale)	N	SD
Blind taste	1	2.79	2.00	291	1.621
	2	2.93	3.00	291	1.453
Taste with COO	3	3.56	3.00	291	1.722
	4	3.64	3.00	291	1.660
Taste with full info	5	5.16	5.00	291	1.907
	6	3.39	3.00	291	1.354

Outliers that are significant are removed to avoid an effect on the OLS regression. Cook's Distance (D) is checked for the regression D> 4/n. For Chinese data, WTP for wine one (Code 29, 151, 128), wine two (Code 29), and wine six (Code 25,119,120,159,163) were removed.

5.3.1.1 Significance of Differences between Chinese Respondents' WTP and Retail Price

WTP results were compared against the retail price according to retail prices from winesearcher.com. The t-test results demonstrated significant differences between WTP and the retail price for all six wines, especially for the two Chinese wines, wine three and wine five. WTP was higher than the retail price for wine one and wine six (Table 5.8).

Table 5.8: Chinese respondents' WTP for the six wines compared with the retail price

Wine	COO	Retail price RMB / (Likert scale)	Mean WTP RMB / (Likert scale)	Mean Difference (RMB)	t
1	China	97 (1.83)	148 (2.79)	+51	10.412***
2	France	198 (3.74)	155 (2.93)	-43	-9.493***
3	China	484 (9.13)	189 (3.56)	-295	-53.330***
4	France	223 (4.21)	193 (3.64)	-30	-5.037***
5	China	412 (7.77)	273 (5.16)	-139	-22.658***
6	France	124 (2.34)	180 (3.39)	+56	13.499***

*0.1 confidence level, ** 0.05 confidence level, *** 0.000 confidence level

5.3.2 French Respondents

From all 276 respondents from France, the WTP for wines one and two, under the blind tasting condition were 1.64 and 1.60 (RMB87/€11.5 and RMB85/€11.2) (see Table 5.9 & Figure 5.10). The WTP for wines three and four, under the tasting condition with country of origin and region of origin information, were 1.99 and 2.18 (RMB105/€13.8 and RMB116/€15.3). The WTP for wines five and six, under the tasting condition with full information, were 2.94 and 2.41 (RMB156/ €20.6 and RMB128/ €16.9). French wine consumers' WTP for the wines increased when more objective information was progressively provided in the tasting.

Table 5.9: French WTP for the six study wines

Tasting conditions	Wine	Mean WTP (Likert scale)	Median WTP (Likert scale)	N	SD
Blind taste	1	1.57	1.00	269	0.797
	2	1.57	1.00	269	0.842
Taste with COO	3	1.91	2.00	269	0.881
	4	2.13	2.00	269	1.124
Taste with full info	5	2.84	3.00	269	1.310
	6	2.36	2.00	269	1.107

Outliers were removed after checking the Cook's Distance. WTP for wine one - (Code 29, 53, 71), wine two (Code 196), wine three (Code 38, 80, 96, 196), wine five (23, 31, 32, 35, 44) and wine six (Code 196) were removed.
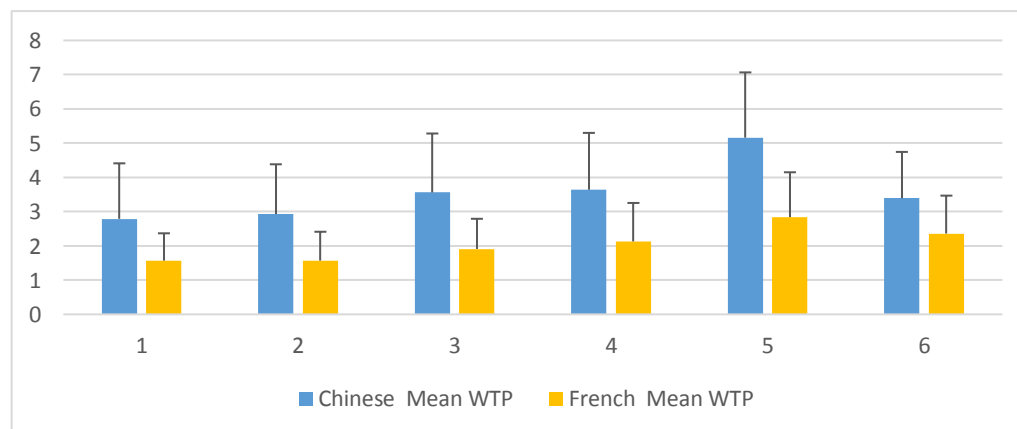
Figure 5.10: French and Chinese Wine Consumers' WTP for the Six Wines

5.3.2.1 Significance of Differences between French Respondents' WTP and Retail Price

Similarly, the French WTP results are compared against the retail price (Table 5.10). The t-test results demonstrated significant differences between French consumers' WTP and the retail price for five wines (wine one to wine five). The t-test results are particularly significant for the two Chinese wines, wine three and wine five, but also for wine two, from France. The WTP was higher than the retail price for all wines except wine six.

Table 5.10: French respondents' WTP for the six wines compared with the retail price

Wine	COO	Retail price RMB / (Likert scale)	Mean WTP RMB / (Likert scale)	Mean Difference (RMB)	t
1	China	97 (1.83)	83 (1.57)	-14	-4.942***
2	France	198 (3.74)	83 (1.57)	-115	-42.799***
3	China	484 (9.13)	101 (1.91)	-383	-133.971***
4	France	223 (4.21)	113 (2.13)	-226	-28.133***
5	China	412 (7.77)	152 (2.88)	-260	-55.384***
6	France	124 (2.34)	125 (2.36)	+1	0.688

*0.1 confidence level, ** 0.05 confidence level, *** 0.000 confidence level*

The Chinese WTP is significantly higher than the French WTP, with a mean of 3.61, median 3.00 and standard deviation 1.814 (Table 5.11), compared with the French figures of 2.12, median 2.00 and standard deviation 1.225 (which indicates that the dispersion was smaller, as well as the actual values).

Table 5.11: Combined French and Chinese WTP: Likert scale results

Respondents	Wines	Mean WTP (Likert scale)	Median WTP (Likert scale)	N	SD	Lower Range	Upper Range
French	1-6	2.12	2.00	1,672	1.225	1	9
Chinese	1-6	3.61	3.00	1,798	1.814	1	11

5.4 Model Estimation

5.4.1 Non-Normally Distributed WTP

By Shapiro-Wilk tests, Chinese respondents' WTP for each of the six wines are not normally distributed (significance at $p<0.000$). All the WTP distributions are

positively skewed to the right, except that for wine five which has negative skewness. As for the French respondents' WTP, all six wines are non-normally distributed (significance at p=0.000). All the results are found to be positively skewed to the right.

5.4.2 Multicollinearity

To avoid possible collinearity, the correlations between the explanatory variables are studied. The resulting hedonic-pricing equation has produced parameters that are found to have high variance inflation factors (VIF) that is, VIF >10, especially when the interaction terms are accounted for. Here, one step backward to regress the variables without the interaction terms was conducted for the regression. The resulting regression produces small VIF ≤ 3, and is within the tolerance threshold VIF<4. This shows that the high VIF in OLS models 1 and 2 is caused by the interaction variables, which by nature are correlated to the consumers' preference of the sensory variables $Sen_{n,i,j}$, and the ranking of importance of these variables $Imp_{n,i}$. Such multicollinearity will produce adverse consequences and will affect the p-value and the R^2 results. For the purpose of comparative study of the preferences of French and Chinese respondents, this study retained all the explanatory variables (Gujarati, 1978b) instead of using factor analysis at this stage to trim down the number of variables (Oczkowski, 1994b).

5.4.3 Heteroscedasticity

The Goldfeld-Quandt test was performed. Because the data collected are cross-sectional not longitudinal, WTP are randomly separated into two subsamples for regression, and their respective $SSE_{h, n=445, p=71} = 0.51693$, $SSE_{l, n=442, p=71} =$

0.49047, produced $F_{GQ, \alpha=0.025\,(370,\,373)} = 1.111$. As the critical value $F_{\alpha=0.025\,(120,\,120)}$ =1.35, or $F_{\alpha=0.025\,(60,\,60)}$ =1.53, the F value from Goldfeld-Quandt does not fall into the rejection zone. The null hypotheses of homoscedasticity cannot be rejected. The variance is found constant in the two sub-samples, and no heteroscedasticity is evident.

The scatter plot of residuals for Chinese and French respondents are validated (see Figures 5.11 and 5.12). Residuals are centred on zero throughout the Chinese and French models. Residuals are consistent with random errors.
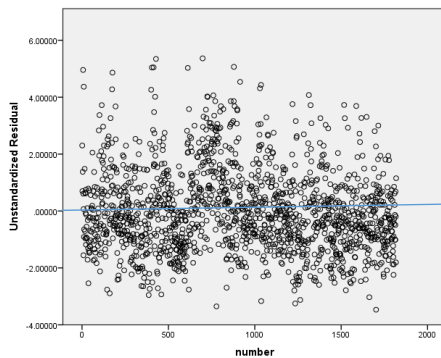
Figure 5.12: Scatter Plot for Heteroscedasticity Assessment: Chinese Respondents
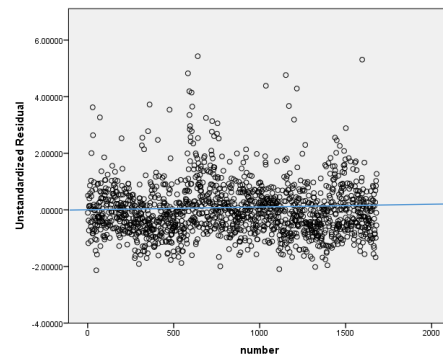
Figure 5.13: Scatter Plot for Heteroscedasticity Assessment: French Respondents

5.4.4 Tasting Condition Dummy and Domestic Wine Dummy

Non-parametric ANOVA was adopted to test the Chinese wine and French wine group medians (domestic wine dummy). The two important assumptions of the Friedman test are checked (Table 5.12): first, dependent variables are ordinal and/or continuous variables; and second, to test for the wine group (Chinese wine vs French wine), or culture group (Chinese respondents vs French respondents), Mann-Whitney results were used; to test for tasting conditions (three conditions: blind tasting; tasting with COO; tasting with full information) the Friedman test was used.

Table 5.12: Friedman and Mann-Whitney test for the wine group and tasting conditions

Respondents	Wines	Friedman test	Mann-whitney test		
		Chi-square	Blind vs COO	Blind vs Full info	COO vs Full info
Chinese	3 Chinese wines (wines 1, 3, 5)	305.017***	-	-	-
	3 French wines (wines 2, 4, 6)	71.937***	-	-	-
	All wines	-	-8.561***	-13.803***	-6.526***
French	3 Chinese wines (wines 1, 3, 5)	191.972***	-	-	-
	3 French wines (wines 2, 4, 6)	141.47***	-	-	-
	All wines	-	-8.596***	-15.386***	-8.280***
Combined	All wines	-	-10.437***	-18.330***	-8.988***

*0.1 confidence level, ** 0.05 confidence level, *** 0.000 confidence level, COO= country of origin*

Table 5.12 whows significant differences in both Chinese respondents' WTP and French respondents' WTP in the three tasting conditions. The same is found for the combined model by Mann-Whitney tests with significance at p<0.000 for all estimates, i.e. there are significant differences in the WTP in the Chinese respondents model under the three tasting conditions; and there are significant differences in the WTP in the French respondents model under the three tasting conditions. This chi-square result enabled the rejection of the null hypothesis, and reconfirmation that the three conditions are independent, i.e. they can be used as a dummy in a later hedonic-pricing analysis.

5.4.5 Knowledge Dummy

The self-evaluated knowledge level, measured on a Likert scale of 1 to 7, was included in the hedonic-pricing model after the pilot study. Since the seven knowledge levels on the scale did not produce particularly high F tests results, scores were converted into three knowledge levels, similar to Wang and Spence (2018). Considering the importance of having equal portions within the scale, and to have to comparable French and Chinese figures, it is also not ideal to use factor analysis to cluster the segment. The three knowledge levels were finally defined to be under-average (UA), for Likert scores under 3; average (A) for Likert scores of 3 to 5; and above-average (AA), for Likert scores of more than 5. Table 5.13 presents the descriptive statistics for WTP of the Chinese and

French respondents, for each of the wines and for the combination of the six wines.

5.4.6 Descriptive Statistics for Chinese and French WTP

Many respondents, 63 percent of the Chinese sample and 69 percent of the French sample, classified themselves as being at the average knowledge level. There was no particular tendency for Chinese respondents to prefer to choose the middle of the scale rather that the French (Lee et al., 2002). For the Chinese there was a tendency for AA respondents to have a higher WTP, compared with the A level and UA respondents. It was, however, the other way round for the French respondents, in that the tendency was for the UA respondents to have a higher WTP.

Table 5.13: WTP by knowledge level

Conditions	Knowledge#	Wine	Chinese				French			
			Mean	Median	N	SD	Mean	Median	N	SD
Taste blind	UA	1. Chinese wine	2.72	2.50	90	1.558	1.64	1.00	50	0.802
		2. French wine	2.83	3.00	90	1.448	1.78	1.00	50	1.166
	A	1. Chinese wine	2.82	2.00	182	1.613	1.57	1.00	181	0.762
		2. French wine	3.00	3.00	182	1.494	1.53	1.00	181	0.778
	AA	1. Chinese wine	3.00	2.00	15	2.236	1.28	1.00	32	0.683
		2. French wine	2.93	3.00	15	1.033	1.41	1.00	32	0.560
Taste with COO	UA	3. Chinese wine	3.40	3.00	90	1.641	2.22	2.00	50	1.055
		4. French wine	3.38	3.00	90	1.733	2.30	2.00	50	1.093
	A	3. Chinese wine	3.55	3.00	182	1.706	1.83	2.00	181	0.836
		4. French wine	3.73	4.00	182	1.622	2.08	2.00	181	1.072
	AA	3. Chinese wine	4.47	4.00	15	2.066	1.81	2.00	32	0.693
		4. French wine	4.27	4.00	15	1.486	1.78	2.00	32	0.792
Taste with full info	UA	5. Chinese wine	4.89	5.00	90	2.143	3.00	3.00	50	1.400
		6. French wine	3.33	3.00	90	1.422	2.80	3.00	50	1.429
	A	5. Chinese wine	5.27	5.00	182	1.796	2.74	3.00	181	1.217
		6. French wine	3.38	3.00	182	1.332	2.26	2.00	181	0.991
	AA	5. Chinese wine	5.47	5.00	15	1.727	2.72	3.00	32	1.114
		6. French wine	3.80	4.00	15	1.373	2.09	2.00	32	0.995
all 6 wines	UA	all 6 wines	3.44	3.00	550	1.799	2.35	2.00	306	1.362
	A	all 6 wines	3.65	3.00	1120	1.798	2.09	2.00	1154	1.201
	AA	all 6 wines	4.18	4.00	99	1.955	1.95	2.00	204	1.109

#UA = under-average knowledge level, A = average knowledge level, and AA = above-average knowledge level

Post hoc tests (see Table 5.14 for results) were conducted to assess the pattern of Chinese and French WTP in relation to the knowledge level. Wine three, wine four and wine six (so as the combined one, signify as 'all') have stronger significance, verifying there are differences between the three knowledge levels. Their relationships are explained later based on the hedonic-pricing analysis.

Table 5.14: Post hoc analysis on WTP for the three knowledge levels

Code	COO	Chinese				French			
		Kruskal Wallis	UA vs A# (1v2)	UA vs AA (1v3)	A vs AA (2v3)	Kruskal Wallis	UA vs A (1v2)	UA vs AA (1v3)	A vs AA (2v3)
1	Chinese	0.022	-0.143	-0.004	-0.062	5.951*	-0.666	2.357**	-2.210**
2	French	0.64	-0.881	-0.613	-0.164	0.93	-0.894	-0.778	-0.210
3	Chinese	6.599**	-0.483	-2.387**	-2.491**	4.879*	-2.183**	-1.459	-0.172
4	French	9.012**	-1.894*	-2.747***	-2.024**	4.608*	-1.182	-1.175**	-1.540
5	Chinese	3.737	-1.670*	-1.416	0.723	1.207	-1.090	0.694	-0.124
6	French	2.849	-0.522	-1.806*	-1.429	6.467**	-2.302**	-2.030**	-0.791
all	all	16.36***	-2.559**	-3.766***	-2.684***	13.039***	-2.907***	-3.329***	-1.638

COO = country of origin

#UA = under-average knowledge level, A = average knowledge level, and AA = above-average knowledge level

There is a clear preference for UA who enjoy the alcohol content in wine (Table 5.15) to buy dependent on price, with no drinking pattern, for both Chinese and French respondents. Respondents with a higher level of knowledge will search for new products all the time and buy based on region of origin; AA respondents will also go to events and drink frequently.

Table 5.15: Wine experience and consumption behaviour, by knowledge level

	Chinese			French		
	UA(%)	A(%)	AA (%)	UA(%)	A(%)	AA (%)
Wine purchase						
Buy dependent on price	44.6	23.7	5.9	38.8	13.7	11.8
Buy dependent on grape variety	21.7	29.6	23.5	4.1	11.1	0.0
Buy new products from time to time	15.2	18.3	29.4	36.7	43.7	23.5
Search new products all the time and buy based on region of origin	18.5	28.5	41.2	20.4	31.6	64.7
Chinese (N=1770, χ2=117.815, sig<0.000, df = 6)						
French (N=1638, χ2=213.709, sig<0.000, df = 6)						
Wine consumption						
Enjoy alcohol in wine, no drinking pattern	54.3	37.8	5.9	60.0	13.2	2.9
Drink regularly and loyal to brands	17.4	9.2	0.0	14.0	4.2	0.0
Enjoy going to tastings	4.3	13.5	11.8	14.0	40.5	47.1
Taste and drink and go to events all the time	23.9	39.5	82.4	12.0	42.1	50.0
Chinese (N=1764, χ2=204.817, sig<0.000, df = 6)						
Wine passion and winery visit experience						
Not visited wineries before	90.4	78.6	47.1	22.0	2.1	0.0
Visited wineries	6.4	10.7	5.9	70.0	47.6	2.9
Read about wine, and visited wineries a lot	1.1	7.0	29.4	8.0	28.6	8.8
Knowledgeable, on wine tours many times	2.1	3.7	17.6	0.0	21.7	88.2
Chinese (N=1788, χ2=193.173, sig<0.000, df = 6)						
Frequency of consumption						
Less than once a month	56.5	25.7	5.9	11.8	1.6	0
More than once a month, less than once a week	27.2	34.2	11.8	39.2	19.3	2.9
More than once a week	13.0	33.2	47.1	43.1	62	73.5
Usually everyday	3.3	7.0	35.3	5.9	17.2	23.5

Note: Chi-square values are provided only for results that are statistically significant

While 90 percent of the UA Chinese respondents had never visited a winery, over 70 percent of the UA French respondents had done so. Only 18 percent of the AA Chinese respondents had visited a winery and been on wine tours many times, while over 88 percent of AA French had done so.

The frequency of consumption also demonstrates distinct differences between the two national groups. While over 57 percent of the UA Chinese respondents consumed wine less than once a month, only 12 percent of the UA French respondents did so. A much larger proportion of the French respondents drank more than once a week (74 percent) than of the Chinese respondents (47 percent).

Moreover, the French respondents had a significantly longer drinking history (Table 5.16), measured as 'wine experience' in this study, than the Chinese respondents. The French respondents who classified themselves as AA in knowledge level had a lower wine experience (13 years) than those UA in knowledge level (18 years). It was, however, the other way round for Chinese respondents: those with an AA knowledge level had a higher wine experience (8 years) than those with a UA knowledge level (5 years).

Table 5.16: Wine experience and consumers' motivation, by knowledge level

	Chinese			French		
	UA(%)	A(%)	AA (%)	UA(%)	A(%)	AA (%)
Wine experience (mean)	4.6	4.8	7.5	17.7	16.6	13.4
Wine experience (SD)	7.169	5.181	5.591	11.091	12.555	8.910
Why you drink wine						
Health	39.4	32.8	11.8	4.0	6.3	0.0
History and culture	10.6	33.3	47.1	22.0	57.3	84.8
Feeling of euphoria	26.6	20.8	23.5	20.0	11.5	0.0
Other	23.4	13.1	17.6	54.0	25.0	15.2

With regard to why the respondents drink wine, most Chinese respondents did so for the health benefits (39 percent of UA respondents; 33 percent for A respondents). But a large proportion of the AA respondents did so for the culture and history around it (47 percent). Very few of the French respondents, drank

wine for the health benefits (4 percent of UA respondents; 6 percent for A respondents); most of the French respondents in the UA group drank because they like wine or like the taste of wine, and nearly all the AA respondents drank for cultural and historic reasons (85 percent).

5.4.7 Descriptive Statistics for Preferences: Independent Variables

Table 5.17 shows the revealed sensory preferences of the Chinese respondents (see also Figure 5.13). The top three by mean are COLOR (5.07), AROMA (4.84) and BALANCE (4.57), whereas for the French respondents, these are COLOR (4.97), AROMA (4.26) and ALCOHOL (4.13). The stated sensory preferences of the Chinese respondents are BODY (6.17), BALANCE (6.10) and LENGTH (6.02), whereas for French respondents these are BALANCE (6.14), AROMA (5.92) and BODY (5.61) (see Figure 5.14). The top three objective preferences of the Chinese respondents are REGION OF ORIGIN (5.30), REPUTATION (5.20) and COUNTRY OF ORIGIN (5.18), whereas for the French respondents, these are REGION OF ORIGIN (5.62), FRIENDS AND FAMILY RECOMMENDATIONS (5.47) and COUNTRY OF ORIGIN (5.29) (Figure 5.15).
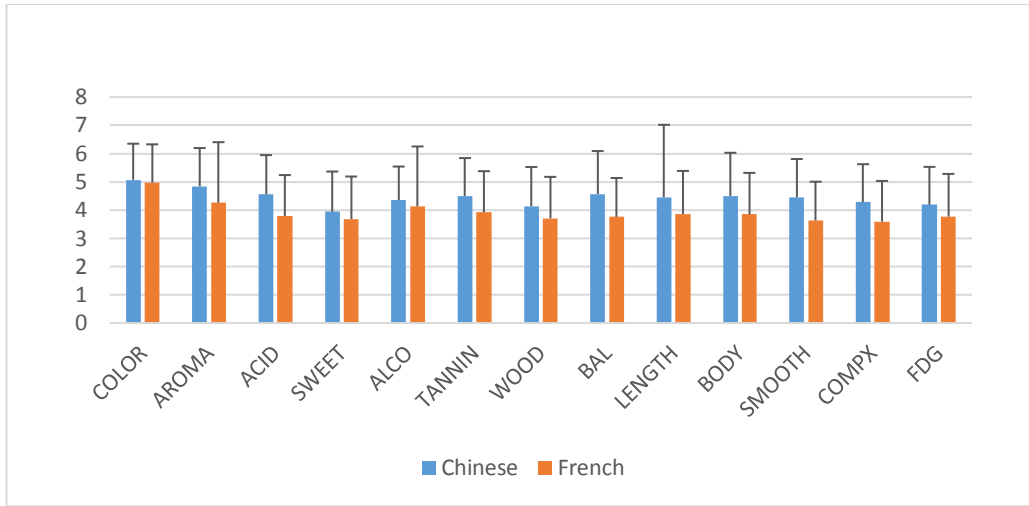
Figure 5.13: Revealed Sensory Preferences of Wine Consumers
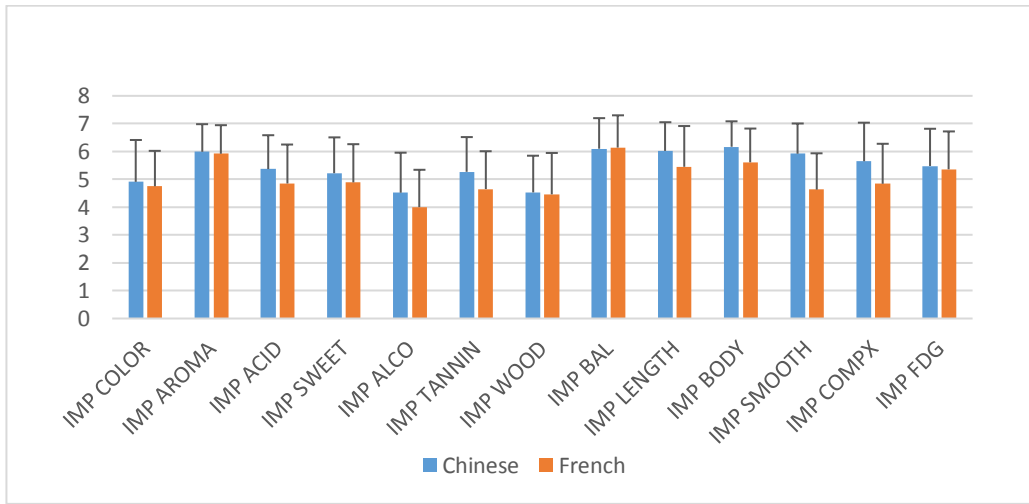
Figure 5.14: Stated Sensory Preferences of Wine Consumers
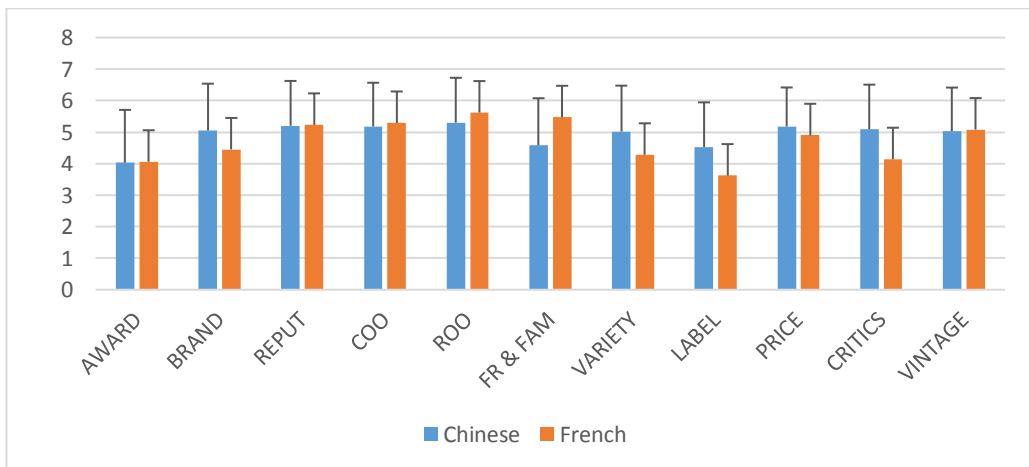
Figure 5.15: Objective Preferences of Wine Consumers

Table 5.17: Independent variables for Chinese and French respondents

Independent variables	Chinese				French			
	N	Mean#	Median#	SD	N	Mean#	Median#	SD
Revealed sensory preferences								
COLOR	1635	**5.07**	5.00	1.280	1475	4.97	5.00	1.357
AROMA	1635	4.84	5.00	1.356	1475	4.26	4.00	2.144
ACID	1635	4.56	5.00	1.386	1475	3.79	4.00	1.449
SWEET	1635	3.94	4.00	1.425	1475	3.68	4.00	1.508
ALCO	1635	4.35	4.00	1.191	1475	4.13	4.00	2.122
TANNIN	1635	4.50	5.00	1.341	1475	3.92	4.00	1.457
WOOD	1635	4.14	4.00	1.386	1475	3.71	4.00	1.466
BAL	1635	4.57	5.00	1.520	1475	3.76	4.00	1.375
LENGTH	1635	4.45	4.00	2.569	1475	3.86	4.00	1.525
BODY	1635	4.50	5.00	1.529	1475	3.85	4.00	1.466
SMOOTH	1635	4.45	4.00	1.358	1475	3.63	4.00	1.376
COMPX	1635	4.28	4.00	1.344	1475	3.59	4.00	1.441
FDG	1635	4.19	4.00	1.339	1475	3.77	4.00	1.511
Stated sensory preferences								
IMP COLOR	297	4.91	5.00	1.503	234	4.75	5.00	1.273
IMP AROMA	297	**5.99**	6.00	0.992	234	**5.92**	6.00	1.025
IMP ACID	297	**5.37**	5.00	1.215	234	4.85	5.00	1.400
IMP SWEET	297	**5.22**	5.00	1.287	234	4.89	5.00	1.373
IMP ALCO	297	4.52	5.00	1.437	234	4.00	4.00	1.343
IMP TANNIN	297	**5.27**	5.00	1.248	234	4.65	5.00	1.360
IMP WOOD	297	4.53	5.00	1.319	234	4.46	5.00	1.488
IMP BAL	297	**6.10**	6.00	1.098	234	**6.14**	6.00	1.160
IMP LENGTH	297	**6.02**	6.00	1.032	234	**5.45**	6.00	1.465
IMP BODY	297	**6.17**	6.00	0.914	234	**5.61**	6.00	1.215
IMP SMOOTH	297	**5.92**	6.00	1.087	234	4.63	5.00	1.305
IMP COMPX	297	**5.65**	6.00	1.385	234	4.84	5.00	1.437
IMP FDG	297	**5.48**	6.00	1.337	234	**5.36**	6.00	1.361
Objective preferences								
AWARD	297	4.03	4.00	1.676	234	4.06	4.00	1.764
BRAND	297	**5.05**	5.00	1.488	234	4.45	5.00	1.586
REPUT	297	**5.20**	5.00	1.424	234	**5.23**	5.00	1.369
COO	297	**5.18**	5.00	1.388	234	**5.29**	6.00	1.399
ROO	297	**5.30**	5.50	1.424	234	**5.62**	6.00	1.322
FR & FAM	297	4.58	5.00	1.496	234	**5.47**	6.00	1.264
VARIETY	297	**5.02**	5.00	1.455	234	4.28	4.00	1.638
LABEL	297	4.53	5.00	1.415	234	3.62	4.00	1.568
PRICE	297	**5.18**	5.00	1.238	234	4.90	5.00	1.225
CRITICS	297	**5.09**	5.00	1.417	234	4.14	4.00	1.588
VINTAGE	297	**5.03**	5.00	1.384	234	**5.08**	5.00	1.486

#Likert scale 1-7, 1 not desirable, 7 desirable

Chapter 6. Hypothesis Testing

6.1 Objective Factors

Estimated results from the hedonic-pricing equation 2, for Chinese and French respondents are tabulated in Table 6.1, to assess the influence of the independent variables on WTP when respondents are provided with full information during tasting.

There are too many insignificant variables in model 1 for the estimated coefficients to correctly identify the factors that influence WTP. Model 2, was therefore derived from model 1 by 'general-to-specific' approach (Song et al., 2008; Song et al., 2015), and its estimated results were used instead. To enable easy comparison, model 1 and model 2 results are both tabulated. For reporting purposes, this study discusses only significant variables.

The adjusted R^2 produced for model 2 for Chinese respondents is 0.341 (n=1,591) and for French respondents is 0.449 (n=1,508), demonstrating goodness of fit, particularly for French respondents' model 2. The average WTP for Chinese respondent is 3.63, showing a significantly higher WTP compared with the average for French respondents (2.12). VIF was checked. No VIF is over 4.772 after this step for the Chinese model 2; and there is no VIF over 3.211 after this step for the French model 2. A linear relationship is confirmed between the independent variables without multicollinearity.

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Table 6.1: Estimation results under the full information tasting condition, for the Chinese and French hedonic-pricing models

Variables	Chinese model 1 Coefficients B	t		Chinese model 2 Coefficients B	t		Sig.	VIF	REF	French model 1 Coefficients B	t		French model 2 Coefficients B	t		Sig.	VIF	REF
Revealed Sensory preferences																		
COLOR	-0.171	-1.085								-0.056	-0.709							
AROMA	0.172	0.764								-0.043	-0.624		0.029	2.830	***	0.005	1.198	H2
ACID	0.179	1.201								0.072	1.055							
SWEET	0.453	3.098	***	0.070	2.263	**	0.024	1.436	H2	0.096	1.375		0.057	2.911	***	0.004	1.546	H2
ALCO	-0.458	-3.331	***							0.048	0.607		0.053	4.299	***	0.000	1.232	H2
TANNIN	-0.053	-0.330								-0.104	-1.439							
WOOD	0.174	1.198								0.121	1.926	*						
BAL	0.030	0.136								0.232	1.775	*	0.132	4.790	***	0.000	2.498	H2
LENGTH	-0.165	-1.564								0.148	1.774	*						
BODY	0.088	0.313		0.078	2.405	**	0.016	1.850	H2	0.143	1.299		0.095	3.709	***	0.000	2.500	H2
SMOOTH	0.352	1.530		0.204	3.458	***	0.001	4.772	H2	0.064	0.730							
COMPX	0.158	0.876		0.147	3.726	***	0.000	2.080	H2	0.055	0.677							
FDG	-0.229	-1.396								0.047	0.562							
Stated Sensory preferences																		
IMP COLOR	-0.253	-1.716	*							-0.072	-0.884							
IMP AROMA	0.053	0.280								0.000	0.004							
IMP ACID	-0.204	-1.512		-0.228	-6.390	***	0.000	1.456	H4	0.057	0.969							
IMP SWEET	0.246	2.206	**							0.013	0.246							
IMP ALCO	-0.313	-2.387	**							-0.093	-1.317		-0.050	-2.704	***	0.007	1.130	H4
IMP TANNIN	-0.127	-0.854		-0.153	-3.382	***	0.001	2.475	H4	-0.007	-0.102							
IMP WOOD	0.287	2.211	**	0.077	2.349	**	0.019	1.412	H4	0.088	1.708	*						
IMP BAL	0.001	0.005								0.077	0.915							
IMP LENGTH	-0.213	-1.756	*	-0.058	-4.208	***	0.000	1.979	H4	0.122	1.941	*						
IMP BODY	-0.053	-0.254								-0.053	-0.682		-0.064	-2.969	***	0.003	1.322	H4
IMP SMOOTH	0.185	1.081								-0.005	-0.078							
IMP COMPX	0.060	0.415								-0.108	-1.786	*	-0.121	-4.913	***	0.000	2.347	H4
IMP FDG	-0.145	-1.231								0.002	0.037							
Interaction terms																		
INT COLOR	0.051	1.777	*	0.013	3.449	***	0.001	1.313		0.018	1.170							
INT AROMA	-0.008	-0.223								0.011	0.930							
INT ACID	-0.034	-1.224								-0.020	-1.431							
INT SWEET	-0.072	-2.637	***							-0.007	-0.493							
INT ALCO	0.073	2.522	**							0.003	0.159							
INT TANNIN	0.027	0.918		0.021	3.785	***	0.000	2.198	H4	0.016	1.126							

	Chinese model 1 Coefficients			Chinese model 2 Coefficients			Sig.	VIF	REF.	French model 1 Coefficients			French model 2 Coefficients			Sig.	VIF	REF.
	B	t		B	t					B	t		B	t				
INT WOOD	-0.044	-1.532								-0.025	-1.997	**						
INT BAL	0.005	0.161		0.015	3.746	***	0.000	1.559		-0.021	-1.044							
INT LENGTH	0.044	1.874	*	0.008	3.529	***	0.000	2.143	H4	-0.019	-1.355							
INT BODY	0.002	0.051								-0.020	-1.066							
INT SMOOTH	-0.040	-1.086		-0.026	-3.655	***	0.000	3.856	H4	-0.014	-0.799							
INT COMPX	-0.003	-0.099								0.020	1.283		0.029	6.293	***	0.000	3.211	H4
INT FDG	0.053	1.849	*	0.021	4.093	***	0.000	1.938		0.019	1.336		0.015	4.876	***	0.000	1.817	
Objective preferences																		
AWARD	-0.026	-0.649								-0.034	-1.547		-0.024	-1.598	*	0.110	1.282	H1
BRAND	0.116	2.263	**							-0.008	-0.328		0.038	2.267	**	0.024	1.261	H1
REPUT	-0.050	-0.927								0.051	1.829	*						
COO	0.026	0.434								0.046	1.210							
ROO	-0.115	-1.802	*							-0.031	-0.757							
FR & FAM	-0.103	-2.519	**	-0.077	-2.995	***	0.003	1.075	H1	-0.066	-2.795	***	-0.087	-4.673	***	0.000	1.055	H1
VARIETY	0.032	0.723								0.035	1.709	*						
LABEL	-0.081	-1.899	*							0.027	1.205							
PRICE	-0.101	-2.072	**	-0.109	-3.441	***	0.001	1.169	H1	-0.068	-2.374	**	-0.059	-2.908	***	0.004	1.102	H1
CRITICS	0.000	-0.009								0.026	1.153							
VINTAGE	0.039	0.816								-0.053	-2.386	**						
Demographic variables																		
GENDER	0.571	4.797	***	0.247	2.916	***	0.004	1.180	H6	-0.093	-1.540							
AGE	0.174	2.781	***	0.137	3.284	***	0.001	1.385	H6	-0.021	-0.719		-0.107	-5.504	***	0.000	1.117	H6
EDU	-0.280	-3.094	***	-0.256	-3.717	***	0.000	1.211	H6	0.031	0.801							
INCOME	0.011	0.547								-0.007	-0.660							
DUMMY (FULL COND)	0.727	7.082	***	0.776	9.754	***	0.000	1.052		0.606	10.472	***	0.597	11.854	***	0.000	1.036	
DUMMY (CHINESE WINES)	0.431	4.355	***	0.505	6.675	***	0.000	1.064	H5	0.133	2.410	**	0.122	2.601	***	0.009	1.006	H5
KNOWLEDGE	0.397	3.821	***	0.201	2.826	***	0.005	1.145	H7	-0.075	-1.260							H8
(Constant)	1.742	0.798		2.048	5.325	***	0.000			-0.051	-0.056		1.787	8.065	***	0.000		
n	869			1591						990			1508					
R²	0.440			0.350						0.527			0.455					
Adjusted R²	0.400			0.341						0.498			0.449					
σ	1.370			1.463						0.838			0.908					
SSR	1194.7			1806.84						729.19			1026					
F	F(57,811)=11.170			F(22,1568)=38.371						F(57,932)=18.236			F(17,1490)=73.194					
p	0.000			0.000						0.000			0.000					
Average WTP	3.60			3.63						2.06			2.12					
SD average WTP	1.769			1.802						1.183			1.223					

*0.1 confidence level, **0.05 confidence level, ***0.01 confidence level*

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The Chinese and French wine consumers' WTP are found to be influenced by different objective characteristics under the full information tasting condition. Price negatively affects both Chinese (β=-0.109, p=0.001) and French (β=-0.059, p=0.004) WTP. Friends and family recommendations also negatively affects the WTP of the Chinese (β=-0.077, p=0.003) and French respondents (β=-0.087, p=<0.000). Additionally, the French consumers' WTP is influenced negatively by award-winning wine (β=-0.024, p=0.100) and influenced positively by brand name (β=0.038, p=0.024).

Hypothesis H1 is supported.

For sensory characteristics under the full information tasting condition, the Chinese WTP is found to be positively influenced by smoothness (β=0.204, p=0.001), complexity (β=0.147, p<0.000), mouthfeel/body (β=0.078, p=0.016), and sweetness (β=0.070, p=0.024). The French WTP is found to be positively influenced by balance (β=0.132, p<0.000), mouthfeel/body (β=0.095, p<0.000), sweetness (β=0.057, p=0.004), alcohol content (β=0.053, p<0.000) and aroma (β=0.029, p=0.005).

Hypothesis H2 is supported.

There are distinct differences in the wine experience of the French and Chinese respondents. When referring to the number of years respondents had been consuming wine, the average for the Chinese is less than five years while the average for the French is 16 years. The Chinese respondents, like the French respondents, were not willing to pay more for expensive wine. Chinese and French consumers will also make their individual decision on wine rather than listen to the recommendations of their friends and family.

Chinese respondents were willing to pay more for sweetness, smoothness, a complex and good mouthfeel under full information tasting condition. French respondents were willing to pay more for balance, sweetness, alcohol content, aroma and good mouthfeel under full information tasting condition. Sweetness and mouthfeel/body are the attributes that affect both the Chinese and French in their WTP. No sensory characteristics negatively affected respondents' WTP for wine.

As in the pilot study, the result again demonstrates that Chinese wine consumers are found to enjoy smoothness and sweetness of wine and are more willing to pay for it. 'Flavour development in the glass' as an attribute discovered in the pilot study had no significant effect on Chinese WTP, whereas complexity and mouthfeel/body are the qualities of wine that Chinese consumers are willing to pay for.

French consumers appreciate wine and are willing to pay for wine by taste and by smell. They are willing to pay for the sensory quality of aroma and the alcohol content of the wine. Athough in the pilot study the French informants stated that they do not enjoy sweetness in wine, here, through the hedonic-pricing analysis, French wine consumers are shown to be willing to pay for the sweetness of the wine. They also are willing to pay for the balance and mouthfeel/body of the wines.

6.2 Sensory Factors

Estimated results from the hedonic-pricing equation 2, for Chinese and French respondents are tabulated in Table 6.2, to assess the influence of the independent variables on WTP when respondents blind-tasted the wines.

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Table 6.2: Estimation results under the blind tasting condition, for the Chinese and French hedonic-pricing models

	Chinese model 3 Coefficients			Chinese model 4 Coefficients						French model 3 Coefficients			French model 4 Coefficients					
	B	t		B	t		Sig.	VIF	REF.	B	t		B	t		Sig.	VIF	REF.
Revealed Sensory preferences																		
COLOR	-0.211	-1.323								-0.094	-1.145							
AROMA	0.199	0.870		0.205	6.337	***	0.000	1.384	H3	-0.051	-0.715		-0.088	-2.684	***	0.007	8.494	H3
ACID	0.166	1.100								0.065	0.913							
SWEET	0.489	3.296	***							0.109	1.500		0.068	3.369	***	0.001	1.583	H3
ALCO	-0.454	-3.249	***							0.041	0.502		0.049	3.796	***	0.000	1.274	H3
TANNIN	-0.048	-0.294								-0.108	-1.441		-0.035	-1.673	*	0.095	1.624	H3
WOOD	0.178	1.213								0.113	1.746	*						
BAL	-0.007	-0.030								0.253	1.862	*	0.126	4.422	***	0.000	2.580	H3
LENGTH	-0.162	-1.508								0.140	1.629							
BODY	0.142	0.494		0.065	1.996	**	0.046	1.864	H3	0.127	1.111		0.080	3.015	***	0.003	2.610	H3
SMOOTH	0.339	1.452		0.219	3.712	***	0.000	4.802	H3	0.096	1.056							
COMPX	0.215	1.179		0.138	3.418	***	0.001	2.185	H3	0.077	0.913							
FDG	-0.236	-1.417								0.031	0.365							
Stated Sensory preferences																		
IMP COLOR	-0.267	-1.788	*							-0.104	-1.224							
IMP AROMA	0.065	0.341								-0.004	-0.059							
IMP ACID	-0.209	-1.522		-0.206	-5.866	***	0.000	1.417		0.050	0.817							
IMP SWEET	0.271	2.399	**							0.020	0.361							
IMP ALCO	-0.313	-2.347	**							-0.096	-1.302		-0.055	-2.859	***	0.004	1.161	
IMP TANNIN	-0.119	-0.787		-0.164	-3.604	***	0.000	2.485		-0.006	-0.093							
IMP WOOD	0.286	2.169	**	0.145	3.486	***	0.001	2.277		0.079	1.473							
IMP BAL	-0.025	-0.156								0.086	0.988							
IMP LENGTH	-0.204	-1.654	*	-0.059	-4.295	***	0.000	1.975		0.118	1.804	*						
IMP BODY	-0.022	-0.103								-0.049	-0.606		-0.075	-3.272	***	0.001	1.397	
IMP SMOOTH	0.171	0.984								0.005	0.065							
IMP COMPX	0.093	0.627								-0.100	-1.592		-0.133	-5.193	***	0.000	2.380	
IMP FDG	-0.144	-1.198								-0.007	-0.122							
Interaction terms																		
INT COLOR	0.055	1.873	*							0.023	1.433							
INT AROMA	-0.012	-0.311								0.013	1.045		0.021	3.983	***	0.000	8.586	
INT ACID	-0.034	-1.185								-0.018	-1.250							
INT SWEET	-0.078	-2.825	***							-0.008	-0.612							
INT ALCO	0.072	2.450	**							0.003	0.179							
INT TANNIN	0.027	0.889		0.022	3.839	***	0.000	2.257		0.015	1.037							
INT WOOD	-0.045	-1.527		-0.012	-1.919	*	0.055	2.509		-0.023	-1.752	*						
INT BAL	0.012	0.363		0.017	4.215	***	0.000	1.548		-0.023	-1.116							

	Chinese model 3 Coefficients			Chinese model 4 Coefficients					French model 3 Coefficients			French model 4 Coefficients				
	B	t		B	t		Sig.	VIF	B	t		B	t		Sig.	VIF
INT LENGTH	0.040	1.713	*	0.009	3.627	***	0.000	2.143	-0.018	-1.225						
INT BODY	-0.007	-0.153							-0.021	-1.065						
INT SMOOTH	-0.037	-0.974		-0.027	-3.735	***	0.000	3.947	-0.016	-0.886						
INT COMPX	-0.012	-0.375		0.021	4.046	***	0.000	1.950	0.017	1.085		0.032	6.702	***	0.000	3.308
INT FDG	0.053	1.826	*						0.021	1.450		0.017	5.151	***	0.000	1.855
Objective preferences																
AWARD	-0.016	-0.387							-0.032	-1.420		-0.032	-2.020	**	0.044	1.310
BRAND	0.111	2.116	**						-0.009	-0.353		0.037	2.126	**	0.034	1.293
REPUT	-0.049	-0.888							0.051	1.778	*					
COO	0.030	0.505							0.055	1.391						
ROO	-0.115	-1.782	*						-0.037	-0.886						
FR & FAM	-0.103	-2.475	**	-0.065	-2.549	**	0.011	1.067	-0.067	-2.734	***	-0.087	-4.503	***	0.000	1.066
VARIETY	0.034	0.758							0.032	1.503						
LABEL	-0.084	-1.924	*						0.026	1.106						
PRICE	-0.097	-1.961	**	-0.101	-3.233	***	0.001	1.157	-0.064	-2.169	**	-0.057	-2.747	***	0.006	1.100
CRITICS	-0.005	-0.109							0.028	1.186						
VINTAGE	0.045	0.924							-0.055	-2.365	**	-0.033	-1.923	*	0.055	1.121
Demographic variables																
GENDER	0.572	4.734	***	0.258	3.073	***	0.002	1.158	-0.085	-1.363						
AGE	0.173	2.729	***	0.151	3.608	***	0.000	1.383	-0.016	-0.536		-0.103	-5.143	***	0.000	1.126
EDU	-0.283	-3.077	***	-0.244	-3.540	***	0.000	1.209	0.029	0.709						
INCOME	0.010	0.067							-0.006	-0.565						
DUMMY (BLIND COND)	-0.551	-4.928	***	-0.569	-6.938	***	0.000	1.103	-0.390	-6.224	***	-0.443	-8.340	***	0.000	1.084
DUMMY (CHINESE WINES)	0.416	4.132	***	0.477	6.342	***	0.000	1.049	0.119	2.089	**	0.112	2.320	**	0.020	1.010
KNOWLEDGE	0.399	3.778	***	0.199	2.792	***	0.005	1.146	-0.068	-1.107						
(Constant)	1.879	0.846		1.805	4.501	***	0.000		0.404	0.432		2.522	10.217	***	0.000	
n	874			1603					990			1490				
R²	0.422			0.341					0.493			0.438				
Adjusted R²	0.382			0.332					0.462			0.430				
σ	1.391			1.470					0.868			0.924				
SSR	1147.588			1765.130					681.415			977.013				
F	F(57,811)=10.408			F(22,1580)=37.129					F(57,932)=15.881			F(20,1469)=57.157				
p	0.000			0.000					0.000			0.000				
Average WTP	3.61			3.63					2.06			2.12				
SD average WTP	1.771			1.798					1.183			1.224				

*0.1 confidence level, **0.05 confidence level, ***0.01 confidence level

VIF was checked and exhibited no multicollinearity in model 4 of either the Chinese or the French sample. The adjusted R^2 produced for model 4 for Chinese respondents is 0.332 (n=1,603) and for French respondents is 0.430 (n=1,490), demonstrating goodness of fit of the models, particularly the French model (Table 6.2). The Chinese and French wine consumers' WTP is found to be influenced by different sensory characteristics under the blind tasting condition. The Chinese WTP is influenced by smoothness (β=0.219, p<0.000), aroma (β=0.205, p<0.000), complexity (β=0.138, p=0.001), and mouthfeel/body (β=0.065, p=0.046). The French WTP is influenced by more sensory charateristics. Under the blind tasting condition, the French WTP is positively influenced by balance (β=0.126, p<0.000), mouthfeel/body (β=0.080, p=0.003), sweetness (β=0.068, p=0.001), and alcohol conent (β=0.049, p<0.000). The French WTP is negatively influenced by aroma (β=-0.088, p=0.007), and tannin (β=-0.035, p=0.095).

Hypothesis H3 is supported.

It is important to note that aroma has a positive influence on the Chinese WTP and a negative influence on the French WTP. French respondents were willing to pay more for the balance, sweetness, alcohol content and good mouthfeel/body of a red wine under the blind tasting condition.

Chinese respondents were willing to pay more for the aroma, smoothness, a complex and good mouthfeel wine under the blind tasting condition. Under the full information tasting condition, the importance of the sensory characteristics that influenced WTP were very similar, except for aroma, which affected Chinese consumers in the blind tasting but not the full information tasting. It is to be expected that consumers should focus more on senses other than taste

during blind tasting; for instance, the aroma of the wine is found to be important and had an influence on Chinese WTP in the blind tasting. However, French respondents, under the blind tasting condition, did not appreciate the aroma as much as under the full information tasting conditions. Although the cause of the difference cannot be determined from the data, it is believed that French consumers are more concerned with the taste, balance, the mouthfeel/body, sweetness and alcohol content, and less willing to pay for tannin wines.

6.3 The Effect of Interactions between Sensory and Objective Factors and WTP

In the full information tasting condition (Table 6.2), the stated importance rating of wood taste (β=0.077, p=0.019) positively influenced Chinese respondents' WTP. Acidity (β=-0.228, p<0.000), tannin (β=-0.153, p=0.001), and length (β=-0.058, p<0.000) negatively influenced Chinese respondents' WTP. As revealed in the tasting, the Chinese WTP was positively influenced by smoothness (β=0.204, p=0.001), complexity (β=0.147, p<0.000), mouthfeel/body (β=0.078, p=0.016) and sweetness (β=0.070, p=0.024). These results demonstrate that the tasting revealed preferences are very different to the stated preferences for the Chinese respondents. To fully analyse this, the interactions were studied and found to provide additional influences on Chinese consumers' WTP: the interaction terms *length* (β=0.008, p<0.000), *smoothness* (β=-0.026, p<0.000) and *tannin* (β=0.021, p<0.000) were all statistically significant. These results demonstrate a different magnitude of the independent variables' coefficients, i.e. the effects on WTP are weakened due to the interaction. The beta coefficients are adjusted: stated importance rating of tannin (β=-0.132); stated importance rating of length (β=-0.050); revealed preference of smoothness (β=0.178).

Hypothesis H4 is rejected for Chinese respondents as there is no one sensory variable that has produced significant results for both their stated sensory preferences and their revealed sensory preferences.

For the French respondents' under the full information tasting (Table 6.2), the stated importance rating of complexity (β=-0.121, p<0.000), mouthfeel/body (β=-0.064, p=0.003) and alcohol content (β=-0.050, p=0.007) negatively influenced French respondents' WTP; that is, the stated importance of complexity, alcohol content and mouthfeel will negatively affect French WTP. As revealed in the tasting, that French WTP is positively influenced by balance (β=0.132, p<0.000), mouthfeel/body (β=0.095, p<0.000), sweetness (β=0.057, p=0.004), alcohol content (β=0.053, p<0.000) and aroma (β=0.029, p=0.005). These results demonstrate that tasting revealed preferences are very different to the stated preferences for the French respondents. The interaction significance was studied and below is the one that will provide additional influence to French consumers' WTP: interaction term *Complexity* (β=0.029, p<0.000). The interaction result demonstrates a different magnitude of the independent variable's coefficient, i.e. the effect on WTP is weakened due to the interaction. The beta coefficient is adjusted: stated importance rating of complexity (β=-0.092).

Hypothesis H4 is also rejected for French respondents.

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6.4 The Effect of Favouritism

As shown in Table 6.1 under the full information tasting condition, Chinese wine (domestic wine) is found to have influenced Chinese respondents' WTP (β=0.505, p<0.000). Similarly, in Table 6.2, under the blind tasting condition, Chinese wine (domestic wine) is found to have influenced Chinese respondents' WTP (β=0.477, p<0.000).

> *Hypothesis H5a is supported.*
>
> *Hypothesis H5b is rejected.*

Again in Table 6.1 under the full information tasting condition, Chinese wine (imported wine) is found to have influenced French respondents' WTP. The coefficient is much weaker than for the Chinese preference (β=0.122, p=0.009). Similarly, in Table 6.2, under the blind tasting condition, Chinese wine (imported wine) is found to have influenced French respondents' WTP (β=0.112, p=0.020).

> *Hypothesis H5c is rejected.*
>
> *Hypothesis H5d is supported.*

It is found that Chinese respondents' WTP is positively affected by domestic and negatively affected by imported wines. For Chinese respondents, the wine being domestic increased their WTP by approximately RMB26.7/ €3.5 when full information was made available. French respondents were also willing to pay a higher price for Chinese wine, but the increase in their WTP was much lower than for Chinese respondents, at RMB6.5/ €0.9.

To demonstrate the strength of hedonic-pricing analysis over the non-parametric test, below the WTP of the Chinese and French respondents is studied by only

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the means and medians, using non-parametric tests (Table 6.3).

For Chinese respondents, the non-parametric ANOVA results demonstrate significant differences in Chinese respondents' WTP on the three Chinese wines in comparison with the three French wines by the Mann-Whitney test Z=-5.153 with significance at p<0.000. When looking closely at the wine pair, when comparing the Chinese respondents' preferences for Chinese or French wines, the Wilcoxon test results demonstrate a significant difference between wine five and wine six under the full information tasting condition (Z=-11.359, p<0.000); the same is true for wine one and wine two under the blind tasting condition, but with weaker significance (Z=-1.658, p=0.097).

Table 6.2: Wilcoxon test (Z) and Friedman test (χ) results for the Chinese respondents' WTP

Wine	Country of origin (COO)	Tasting Conditions	Mean WTP (Likert scale)	Mean Difference by same Taste Condition	Z / χ
1	Chinese	Blind taste	2.79	0.14	-1.658*
2	French	Blind taste	2.93	-	-
3	Chinese	Taste with COO	3.56	0.08	-1.032
4	French	Taste with COO	3.64	-	-
5	Chinese	Taste with full info.	5.16	-1.77	-11.359***
6	French	Taste with full info.	3.39	-	-
1,3,5	Chinese	All three	3.84	-	305.017***
2,4,6	French	All three	3.47	-	71.937***

*0.1 confidence level, ** 0.05 confidence level, *** 0.000 confidence level*

For the French respondents (Table 6.4), the test of non-parametric ANOVA for the Chinese wine and French wine group median lacks significance by the Mann-Whitney test, at Z=-1.494, p=0.135. Therefore, the result of the non-parametric ANOVA is that there is no significant difference between the Chinese wine pair and the French wine pair for the French respondents: that is, whether the wine was from China or from France did not affect French consumers' WTP. When looking closely at the wine pair, when comparing the French respondents' preferences for Chinese or French wines, Wilcoxon test results demonstrate that there are significant differences between wine five and wine six under the full

information tasting condition (Z=-5.384, p<0.000) and also for wine three and wine four under the COO tasting condition (Z=-2.801, p=0.005).

Table 6.3: Wilcoxon test (Z) and Friedman test (χ) results for the French respondents' WTP

Wine	Country of origin (COO)	Taste Conditions	Mean WTP (Likert scale)	Mean Difference by same Taste Condition	Z / χ
1	Chinese	Blind taste	1.57	0.00	-0.143
2	French	Blind taste	1.57	-	-
3	Chinese	Taste with COO	1.91	0.22	-2.801**
4	French	Taste with COO	2.13	-	-
5	Chinese	Taste with full info.	2.88	-0.52	-5.384***
6	French	Taste with full info.	2.36	-	-
1,3,5	Chinese	All three	2.12	-	191.972***
2,4,6	French	All three	2.02	-	141.647***

*0.1 confidence level, ** 0.05 confidence level, *** 0.000 confidence level*

In the hedonic-pricing analysis, the statistically significant results indicate that the French respondents' WTP is affected by Chinese wine. However, the non-parametric ANOVA results are not significant and therefore do not indicate that the French respondents' WTP is affected by Chinese wine (Mann-Whitney test Z=-1.494, p=0.135).

6.5 The Effect of Demographic Factors

The Chinese WTP was influenced by age under the full information (β=0.137, p=0.001) and blind (β=0.151, p<0.000) tasting conditions. Older Chinese respondents were willing to pay more for wines. The French WTP was also influenced by age under full information (β=-0.107, p<0.000) and blind (β=-0.103, p<0.000) tasting conditions but in contrast to the Chinese respondents, it was the younger French respondents who were willing to pay more for wine.

In the hedonic-pricing model, the Chinese WTP was influenced by gender under the full information (β=0.247, p=0.004) and blind (β=0.258, p=0.002) tasting conditions. Female Chinese respondents were more willing to pay for wines than male respondents. However, the French WTP was not significantly influenced by gender.

In the hedonic-pricing model, the Chinese WTP was also influenced by level of education under full information (β=-0.244, p<0.000) and blind (β=-0.256, p<0.000) tasting conditions. Less educated Chinese respondents were willing to pay for wines than the more educated Chinese respondents. The French WTP was not significantly influenced by level of education under either tasting condition.

WTP was not influenced by income under any of the tasting conditions for either the Chinese or the French respondents.

> *Hypothesis H6, Wine consumers' WTP is influenced by demographics is partially supported. Chinese consumers' WTP is influenced by age, gender and education but not income. French consumers' WTP is influenced by age but not by gender, education or income.*

Under normal circumstances a high correlation between income and WTP might be expected. It is believed that since the experiment used consumption grade wine rather than luxury /investment-grade wine, the income effect was not significant and did not affect the WTP of either French and Chinese respondents.

6.6 The Effect of Consumers' Level of Knowledge

Hedonic-pricing analysis results confirmed that the Chinese respondents' knowledge level under the full information (β=0.201, p=0.005) (Table 6.1) and the blind (β=0.199, p=0.005) (Table 6.2) tasting conditions positively influenced WTP. As their knowledge increases, so does their willingness to pay higher prices for the wines.

> *Hypothesis H7, that Chinese consumers' WTP is influenced by their level of knowledge, is supported.*

The same was not true for the French respondents. A pattern can be seen from the mean results; however, it is apparent that the differences are too small between the different levels of knowledge of the French respondents, and not significant in the hedonic-pricing analysis.

Hypothesis H8, that French consumers' WTP is influenced by their level of knowledge, is rejected.

6.7 Resulting Hedonic-Pricing Functions

Having tested the hypotheses, the resulting hedonic-pricing function is now estimated. WTP for Chinese respondents is:

$WTP_{ij} =$ 2.048 + [(0.070 *SWEET*) + (0.078 *BODY*) +
(0.178 *SMOOTH*) + (0.147 *COMPX*) + (-0.228 *IMP ACID*) +
(-0.132 *IMP TANNIN*) + (0.077 *IMP WOOD*) +
(-0.050 *IMP LENGTH*) + (-0.077 *IMP FR & FAM*) +
(-0.109 *IMP PRICE*)] + (0.505 *DOMESTIC WINE*) +
(0.247 *FEMALE*) + (0.137 *AGE*) + (-0.256 *EDU*) +
(0.201 *KNOWLEDGE*) + (0.776 *FULL COND*)

Equation 3 (Chinese)

WTP for French respondents is:

$WTP_{ij} =$ 1.787 + [(0.029 *AROMA*) + (0.057 *SWEET*) + (0.053 *ALCO*) +
(0.132 *BAL*) + (0.095 *BODY*) + (-0.050 *IMP ALCO*) +
(-0.064 *IMP BODY*) + (-0.092 *IMP COMPX*) +
(-0.024 *IMP AWARD*) + (0.038 *IMP BRAND*) +
(-0.087 *IMP FR & FAM*) + (-0.059 *IMP PRICE*)]+
(0.122 *IMPORTED WINE*) + (-0.107 *AGE*) + (0.597 *FULL COND*)

Equation 4 (French)

Chapter 7. Discussion

In the present study, hedonic-pricing theory was applied to study wine consumers' preferences and their WTP. The study is based upon 583 respondents from a total of six regions in France and China, through tastings of the same six wines.

7.1 Objective and Sensory Wine Attributes that Determine WTP

This section addresses hypotheses H1, H2, H3 and H4: that wine consumers' WTP is influenced by the objective characteristics of wine when respondents are provided with full information on a wine during tasting; that wine consumers' WTP is influenced by the revealed quality of the sensory characteristics when respondents are provided with full information on a wine during tasting; that wine consumers' WTP is influenced by the revealed quality of the sensory characteristics when respondents are asked to taste a wine without access to objective information; that wine consumers' WTP is influenced by the interaction between their perceived importance of the sensory attributes and the revealed quality of the sensory attributes.

Through the hedonic-pricing analysis for the French and Chinese models, 11 objective wine attributes were studied. The WTP of Chinese and French wine consumers was found to be negatively influenced by the price of wine, and friends and family recommendation. French wine consumers were positively influenced by the brand name of the winery and negatively influenced by award-winning wines.

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Among the 13 sensory wine attributes studied, it was found that consumers' WTP was positively influenced by sweetness and mouthfeel/body. Chinese wine consumers' WTP was positively influenced by the smoothness and complexity of the wine, whereas French wine consumers were positively influenced by the aroma, alcohol content and balance of the wine.

In general, there are more sensory preferences than objective preferences that influence both Chinese and French wine consumers' WTP. Also, while nearly all of the objective preferences negatively affected wine consumers' WTP, the sensory preferences all overwhelmingly and positively influenced both Chinese and French wine consumers' WTP.

Many journal articles have discussed the importance of objective characteristics which affect the price perceptions of wine consumers. In this study, much weaker associations with WTP were found for objective product characteristics than for sensory product characteristics.

Although high prices of wine can signify high quality (Goldstein et al., 2008), inexpensive wines are generally preferred by consumers to achieve the highest value for money (Liu & Murphy, 2007; Liu et al., 2014), and are preferred in blind tasting sessions (Goldstein et al., 2008). Different consumer groups' WTP is affected by price differently (Almenberg & Dreber, 2011; Lewis & Zalan, 2014). The results in this study have demonstrated that the WTP of wine consumers is negatively influenced by their perceived importance of price in the choice of wine.

In economic theory, price and income should be closely correlated. However, income was found not have an important effect on WTP. Other explanations for

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consumers' price perceptions need to be investigated. The descriptive results demonstrate a distinct difference between the wine experience of the French and Chinese respondents, at five years for the Chinese and 16 years for the French. Nonetheless, the Chinese and French were similar in these respects, sharing the same price concern and having negative perceptions of the importance of price. Also, both the Chinese and French wine consumers will make their individual decisions on wine rather than listen to the recommendations of their friends and family, which is in contrast to an earlier Chinese study by Liu et al. (2014).

Additionally, the present study's finding demonstrate the sophistication of French wine consumers. Award-winning was not an important attribute to the French respondents and in fact negatively influenced their WTP. The French trust their individual taste (on individuality, see Hofstede, 2001). However, a brand name was important to the French respondents and positively influenced their WTP. In Burgundy, it is a phenomenon that Burgundians will make reference to the brand name in their purchases and consumption. A Clos de Vougeot, even a village-level wine, would be very different in quality and price between two different *domaines* because of their brand name.

The perceived sweetness of the wine was found to influence both Chinese and French WTP positively. The Chinese enjoyment of the sweetness of wine is supported in the literature (Li et al., 2011; Liu & Murphy, 2007; Somogyi et al., 2011; Williamson et al., 2012) and in the pilot study.

The preference for sweetness varies between different cultural groups; for example, for Australians sweetness is found to be a negative descriptor (Charters & Pettigrew, 2006). In the present pilot study, sweetness in wine was not enjoyed by French informants. However, the result of hedonic-pricing analysis in the

main study demonstrated that the French respondents were willing to pay more for the sweetness of the wine. This French preference for sweetness may have different implications. 'Sweetness' in the French questionnaire was translated as *douceur*. In French language *douceur* carries two meanings, sweetness and smoothness. In French, *lissage* means smooth also. In the tasting experiment, there were numerous occasions that explanations had to be made that in French *douceur* is *soyeux*. To address this, French respondents were asked for their understanding of the meaning of sweetness to them. Several French respondents related sweetness to smoothness of the wine. An example is that when they tasted a tannic wine, a typical phrase they used to describe was 'it is not sweet enough'. Although sweetness significantly influenced the French WTP, it cannot be definitively concluded whether the French respondents were referring to smoothness or sweetness that influenced their WTP.

The mouthfeel/body of the wine influenced the WTP of the Chinese and French respondents. Mouthfeel, as discussed in Charters and Pettigrew (2007), is the weight and feel of the wine in the mouth. Many consumers associate heavy or weighty wine with Cabernet Sauvignon or Syrah. This finding suitably describes the grape variety used in the present study (Bordeaux varietal). Wine 3 (Chinese) was 100 percent Cabernet Sauvignon. Both the Chinese respondents and the French respondents liked this style of wine and were willing to pay for it. Chinese women enjoyed the mouthfeel, as also noted in marketing journals by Bruwer et al. (2011), Lockshin and Corsi (2012), and Williamson et al. (2012). The present study demonstrates the liking of mouthfeel and body by both genders in the Chinese sample.

The French respondents were willing to pay for the alcohol content of the wine.

Five of the six wines used in the tasting sessions had a 13 percent alcohol content. Wine 3 had an alcohol content of 14.5±1 percent (the highest) and wine 2 of 12.5 percent (the lowest). Lecocq and Visser (2006), in their study of French objective and sensory preferences, argued that some wine consumers perceive a high alcohol content to be unnecessary. This study found that French wine consumers enjoy alcohol in wine and are willing to pay for it. The Chinese, on the other hand, are not willing to pay for the alcohol content of the wine. This result is similar to another preference study conducted in China, in which 'alcohol content under 13 percent' was ranked to be the most unimportant attribute affecting Chinese consumers' wine preference (Yu et al., 2009). In the present study, by hedonic-pricing analysis, it was found that alcohol content positively affected French consumers' WTP. Other researchers have studied alcohol content, expressed either as a percentage by volume (Agnoli, Begalli, & Capitello, 2011; Fountain, Seccia, & Wilson, 2013; Groves et al., 2000; Smith & Mitry, 2007; Verdu Jover et al., 2004; Yoo, Saliba, MacDonald, Prenzler, & Ryan, 2013); or in terms of the chemical composition of wine (Lattey, Bramley, & Francis, 2010). Further research related to wine of various percentages of alcohol and how this affects consumers' preferences and WTP is suggested for a better understanding of French wine consumers.

French respondents were willing to pay not only for the taste of the wine but also for its smell (aroma). France is the only country in the world with a parfum museum, *Le Grand Musée du Parfum*. French respondents were also willing to pay for the balance of a wine. Balance is an important quality indicator as identified in a study of Australian wine consumers (Charters & Pettigrew, 2006a)

and is an important factor in perceptions of wine quality (Verdu Jover et al., 2004).

Complexity has always been the word widely used regarding the quality of wine in various research studies on wine consumers from different countries (Charters & Pettigrew, 2006, 2007; Combris et al., 1997, 2000; Landon & Smith, 1997; Lecocq & Visser, 2001; Lockshin & Corsi, 2012; Yip, Song, & Charters, 2017). In a recent study by Wang and Spence (2018), based on a tasting experiment in United Kingdom, complexity was found to relate to the secondary and tertiary flavours of wine. In the present study, Chinese respondents were willing to pay for the complexity of the wine, but not the French. It is difficult to say whether this difference means that Chinese consumers can detect the secondary and tertiary flavours in the wine, while French consumers cannot. An earlier tasting research study also found that none of the wines were complex according to the French respondents (Schlich, Maraboli, Urbano, & Parr, 2015). To better understand the French meaning or understanding of 'complexity', it is suggested to use a vintage classified Bordeaux wine with similar set-up as Wang and Spence (2018) for the empirical study on wine consumers' preferences in future.

Following the pilot study, a new term was used in the main study, namely 'flavour development in the glass'. While it is thought that 'flavour development in the glass' can have the same meaning as complexity, in the present study, 79 percent of the Chinese respondents did not think it is the same as complexity. So 'flavour development in the glass' was included in the hedonic-pricing analysis. However, it was not found to have any significant effect on WTP, for either the French or the Chinese respondents. An extended research study is under consideration to engage Chinese and French wine consumers to taste and to

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enjoy the same wines over the course of a meal similar to Lewis, Charters, and Lecat (2016) who incorporated time based methods (Wang & Spence, 2018). To do so will allow more time for wine consumers to enjoy the wines in natural setting.

7.2 Differences in WTP between Domestic and Imported Wines

This section addresses hypothesis H5: that country of origin influences wine consumers' WTP.

In numerous earlier studies a wine's country of origin has been found to be of greater importance than objective wine attributes in determining consumes' WTP (Bruwer et al., 2014; Grazia et al., 2008; Hu et al., 2008; Liu & Murphy, 2007; Lockshin & Corsi, 2012; Wang & McCluskey, 2010). Eighty percent of the Chinese and 97 percent of the French respondents in the present study stated that they consider country of origin when they choose a wine.

The WTP of the Chinese and French respondents was separately analysed for their preferences on domestic and imported wines. Chinese respondents' WTP was positively affected by domestic wine. This finding is similar to that of Yang and Paladino (2015) on the preference of Chinese consumers for domestic wines.

Wine five, The Summit 2014, was sponsored by Emma Gao of Silver Heights. This wine, same wine and same vintage was served by the Premier of China, Li Keqiang, to welcome the German Chancellor Angela Merkel during her visit to China. All respondents in the tasting were informed it was an award-winning wine. The effect on the Chinese respondents was found significant, resulting in a WTP of RMB273/ €36.1.

Wine six, The Chateau Les Grands Chenes 2014 was sponsored by Bernard Magrez of Chateau Pape Clement. Mr Magrez owns 40 wineries in Bordeaux and elsewhere. His brand name and reputation are known in both the French and the Chinese markets. The production volume of this wine is limited. With this information known to the respondents, the Chinese WTP, at RMB180/ €23.8, was even higher than the retail price, and much higher than the French WTP.

Superficially, the Chinese wine five used in this study has a high retail price, RMB 412/ €54.4, higher than that of the French wine six, RMB 124/ €16.4. According to economic theory, at least some respondents would be expected to have given a higher WTP for wine five. The Chinese respondents were mostly upper middle class, who might normally prefer premium wines (Zeng & Szolnoki, 2017) and luxury products (KPMG, 2013). Supported by the five-dimensions theory of Hofstede (2001), due to Chinese collectivism and long-term orientation behaviour, Chinese consumers are challenging the established system in the West about quality and value. The Chinese believe in the social system's identity, that is, if the identity of Chinese wines could be strengthened, this will eventually enhance the Chinese self-identity. Chinese consumers hope that in the near future the quality of Chinese wines will be better than that of other countries' wines. For this reason, the Chinese are willing to pay higher prices for their domestic wines.

The domestic wine market in China is huge and currently four out of five bottles consumed are domestic wines (Corsi, Cohen, & Lockshin, 2017). In the hypothesis testing, it was found that the perceived importance of price negatively affected WTP. So the result again reconciles the objective preference of the

Chinese wine consumers, who were not willing to pay RMB412/ €54.4, the retail price for the wine, but RMB 273/ €36.1.

French consumers seem to have moved away from drinking as a collective social activity and as an element of national identity, and to a passion at the individual level (Demossier, 2010). The resulting French WTP for Chinese wine five was RMB152/ €20.1; for French wine six was RMB 125/ €16.5. The French respondents do not appear to have been affected by the objective information, which included the high price of wine five and the wine being served at an official dinner. The objective evaluation by hedonic-pricing analysis concluded that the French WTP was negatively affected by 'award-winning' and 'high-priced' wine.

Cultural distance and physical distance, as studied in the literature, could provide further explanations of the lower WTP of the French respondents compared with the Chinese respondents. French consumers are close to wine in the sense that there is a long history of red wine in France, with large volumes of wine consumed, vineyards are widespread and local wines are of good quality. The result of this study is very similar to Ay, Chakir, and Marette (2014), who found that the closer the consumers are to the vineyard and local wines, the lower is their WTP.

Further, the concept of wine price is very different in Western culture, and WTP is also much lower in the West. Chiodo et al. (2011), note that a premium wine is 'up to €7/ RMB53', super-premium is 'up to €14/ RMB106' and ultra-premium is 'up to €25/ RMB189'. In Bazoche et al. (2008), the WTP for Bordeaux wine among a group of Parisian respondents was on average €2.6 /

RMB20 which is much lower than the WTP of Chinese in the present study, and much lower than the RMB200/ €26.4 found in the study by Camillo (2012).

The Likert scale used in the questionnaire for WTP - €7 / RMB53 for 1 on the scale, €70 / RMB530 for 11 on the scale - was devised in the pilot study in China and France before the main study. It is important to note that during the tastings in France, there were many occasions in which respondents noted that their WTP was actually much less than €7/ RMB53. A similar phenomenon was not noted in the tastings in China.

7.3 Influences of Consumers' Demographic Characteristics on WTP

This section addresses hypothesis H6: that wine consumers' WTP is influenced by their demographic characteristics.

In the present study, China and France were chosen to demonstrate cultural differences. The Hofstede (2001) index scores for uncertainty avoidance, individualism, and long-term orientation of these two groups are polarised. As a result, it is not surprising that the effect of demographic characteristics on their WTP for wine is polarised.

The Chinese WTP was found positively influenced by gender and age, and negatively influenced by education. Female, older Chinese respondents with lower level of education were in general willing to pay more for wine than male, younger and more educated respondents; moreover, because the sample was an upper-middle-class Chinese group with an over-representation of women (67% of the sample were female), this will have increased WTP in the present study. Parallel results with regard to age, gender and education have been found in

marketing research studies of wine and specialty foods (Bruwer et al., 2014, 2011; Stefani et al., 2006).

Contrasting hedonic-pricing results were found for the French respondents in comparison with the Chinese. The French WTP was negatively influenced by age; that is, younger French respondents were more willing to pay for wines than more mature French wine consumers.

During data collection, a significant number of younger French respondents expressed their interest in the imported wines. This was reflected in the terms they chose to describe them, which included 'exotic wines', 'wines from the new world' and 'wines younger French people have never had before'. There is no doubt they were receptive to the wines chosen for the experiment. It was, however, different for the older French respondents. During data collection in France at the ASPTT Tennis Club, several older French male respondents refused to fill in Parts II and III of the questionnaire, as they objected to a head-to-head comparison of Chinese and French wines. Some had ideas that this research was another Judgement of Paris (Taber, 2006).

The Chinese WTP was much higher than the French. The Chinese respondents' usual expenditure on wine was, on average, up to RMB226 / €29.9. This was much higher than the French respondents' usual expenditure on wine, which was, on average, up to RMB105 / €13.8. The relationship found between WTP and usual expenditure was similar in Combris et al. (2009), who studied German and French samples and found that Germans had a higher WTP and their usual expenditure was on average higher. The French respondents in the present study had a much longer history of drinking red wine. It is expected that experienced

consumers are not likely to change their spending habits, and are less willing to pay for new wines (Tozer et al., 2015).

Wine is a kind of normal good, and thus WTP would be expected to increase with income. However, in this study, it was not possible to come to a conclusion on income as this attribute was not significant in the resulting models.

7.4 Influences of Consumer Knowledge on WTP

This section addresses hypotheses H7 and H8: that Chinese consumers' WTP is influenced by their level of knowledge of wine and that French consumers' WTP is influenced by their level of knowledge of wine.

The present study evaluates behaviour differences in two parts, first by studying the significance of the knowledge attribute to Chinese and French respondents by means of the hedonic-pricing analysis, then by trying to understand how this is linked to their consumption patterns and the reasons they drink wine.

From the hedonic-pricing results, the Chinese WTP is found to be influenced by the knowledge level of wine consumers. The higher the knowledge level, the more they are willing to pay for the wines. Table 5.13 shows the consumers who are above-average knowledge level (AA) are willing to pay more for the wines, at 4.18 (RMB221 / €29.2), than the under-average knowledge level (UA), at 3.44 (RMB182 / €24.0). The median is also not the same, with the AA respondents willing to pay more, at 4.00, than the A and UA respondents, at 3.00. However, there was no similar significant difference among the French respondents, and the knowledge level of French respondents did not affect their WTP. The median WTP for UA, A and AA French respondents (see Table 5.13) were are the same at 2.00.

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The UA Chinese respondents had only 4.6 years of drinking experience, mostly consumed wine less than once a month (57 percent) and mostly had not visited a winery before (90 percent). The UA French respondents had 17.7 years of drinking experience, mostly consumed wine more than once a week (43 percent) and had mostly visited a winery before (78 percent) (See Table 5.15 and Table 5.16).

The AA Chinese respondents had 7.5 years of drinking experience, consumed wine more than once a week (82 percent) and had mostly not visited a winery before (47 percent). The AA French respondents had 13.4 years of drinking experience, mostly consumed wine more than once a week (97 percent), and had all visited a winery before (100 percent).

It was that expected knowledge level would affect the Chinese WTP. Their history of red wine drinking is only a 30-year phenomenon. Due to physical distance and cultural distance, a significant number of Chinese consumers have never been to a winery. The frequency of consumption is also distinctly different between UA and AA Chinese respondents. However, such a difference was not noted between UA and AA French respondents.

Of the Chinese respondents, 34 percent consumed wine to promote health; 23 percent consumed for the history and culture around wine; and 26 percent consumed for the feeling of euphoria. When looking closely at how knowledge level affected their wine consumption (Table 5.16), it can be seen that for UA and A Chinese respondents drink for the health benefis. As knowledge level increases, respondents instead tend to drink for the history and cultural reasons around wine. For those 16 percent who mentioned 'others', these were mostly physical reasons: to meet the education requirements, to meet industry

requirements, and for beauty reasons. Only 5 percent of the French respondents consumed wine to promote health; 54 percent consumed it for the history and culture around wine; and 20 percent consumed it for the feeling of euphoria. When looking closely at how knowledge level affected the reason for wine consumption, most of the UA French respondents, 54 percent, said they drank for other reasons than the three presented. The reasons given were not physical but more intangible: they just like wine, like the atmosphere of drinking with friends, or simply like the taste of the wine. Additionally, significantly more respondents in France drank for the history and cultural reasons (A: 57 percent, AA: 85 percent, see Table 5.16).

Wine has been in the French culture for a much longer time than in the Chinese culture and wineries are accessible to the French for purchase and consumption. The French enjoy wine and also have a rich food and wine matching culture to incorporate wine in their meals. The French respondents mostly consumed wine more than once a week and most had visited wineries. On average the respondents from France had over 15 years of experience in drinking wine. As the French have a much longer history and culture in drinking, it is to be expected that their knowledge level would not affect their WTP because the knowledge difference between the UA and AA level is small.

The results made clear that Chinese and French drink for different reasons.

The wine experience of the wine consumers was noticeably different: that for UA Chinese respondents was 5 years, compared with 8 years for AA Chinese respondents. Wine experience for UA French respondents was 18 years, compared with 13 years for AA French respondents. Chinese respondents with higher knowledge levels were willing to pay more for wines than Chinese

respondents with lower knowledge levels. It would be interesting to conduct the study again in 5-10 years, when a group of mature wine consumers are available in China. By then, the Helen mountain classification system will be more mature, and wineries from Ningxia will be more well-known in China and overseas. It is anticipated that the level of knowledge of Chinese wine consumers will have improved by then. This might make them more similar to French consumers in terms of the behavioural aspects of wine consumption; it would be of interest to test whether the reasons for drinking wine had changed, an perhaps become more like the French reasons (drinking for intangible reasons), or whether there was no change and Chinese consumers still drank for physical reasons such as health.

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Chapter 8. Conclusion and Recommendations

This research has provided insights into the preferences and WTP of Chinese and French wine consumers, with regard to wines from China and France. Key implications about the differences between Chinese and French wine consumers based upon consumers' knowledge about wine are discussed in this chapter.

8.1 Theoretical Implications

In this study, hedonic-pricing theory has been applied to compare the two cultures. Hedonic-pricing analysis suggested that wine consumers from China and France are similar. From the product perspective, both Chinese and French wine consumers do not rely on price or on friends and family recommendation in making their consumption decisions. Both the Chinese and French wine consumers enjoy the sweetness and mouthfeel/body of wines. They are sensitive to the quality of the wine and are willing to pay higher prices for a higher-quality product. From the demographic perspective, the Chinese and French wine consumers' WTP was influenced by their age, but in opposite directions: older Chinese wine consumers and younger French wine consumers had a higher WTP for wines. From the tasting conditions perspective, both the Chinese and the French respondents were willing to pay more for wines under the full information tasting conditions than under the country of origin and blind tasting conditions.

Hedonic-pricing analysis showed distinctive differences between the two cultures. From the product perspective, wine consumers from France are willing to pay more for a brand name but are not willing to pay more for an award-winning wine. The Chinese consumers are willing to pay for the complexity and

smoothness of a wine, while French consumers are willing to pay for the aroma, alcohol content and balance of a wine. From the demographic and behavioural perspective, the Chinese respondents' WTP was influenced by their gender, education and wine knowledge. Older Chinese women who are less educated in general terms (a lower level of education) but more knowledgeable about wine (framed as a higher level of involvement in some studies) were willing to pay more for wines.

By means of hedonic-pricing analysis, a knowledge attribute and a wine-origin attribute was built in to test the relationships and differences between Chinese and French wine consumers. Knowledge level was found to affect WTP for the Chinese respondents, but not for the French respondents. The more knowledge the Chinese consumers had, the more they were willing to pay for wines. Country of origin of wine was found to affect WTP for both the Chinese and the French respondents. The important implications are related to their preference for consuming higher-quality wines.

The new-found sensory attribute 'flavour development in the glass' was incorporated into the hedonic-pricing analysis and tested. This new sensory attribute was revealed in the pilot study. Although there was no statistical significance in the resulting hedonic-pricing model regarding flavour development in the glass, this new attribute is worth further investigation by industry professionals. Although industry professionals suggested that flavour development in the glass is similar to complexity, 79 percent of the Chinese respondents and 88 percent of the French respondents stated that flavour development in the glass is *not* the same as complexity. Future research focusing

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on this new attribute is required, not only to shed light on Chinese and French preferences, but also to extend the study to other nationalities.

8.2 Practical and Marketing Implications

In hedonic-pricing analysis, the Chinese and French respondents' stated sensory preferences before the tasting were found to be very different to their revealed sensory preferences at the tasting. Additionally, more sensory attributes than objective attributes featured in the final hedonic-pricing models. This study has confirmed the view of Storchmann (2015) that wine is an experience good, and confirmed the view of Thrane (2004) that it is essential to conduct primary consumer research to study wine attributes under competitive conditions. This study reiterates, from a research design perspective, that it is important to collect consumers' preferences and WTP by tasting. This is a unique study of consumers' preferences, involving 583 consumers in China and France in six regions, through 34 tastings with 234 bottles of sponsored wines.

In both the pilot study and the main study, there is evidence of wine consumers' comprehensive understanding of terms like 'mouthfeel', 'balance' and 'complexity'. With expanded knowledge of wine for general consumers through the internet, magazines and wine educators, the comprehension of sensory attributes should no longer be restricted to experts. Researchers and consumers are encouraged to continue to use such terms so as to expand the wine knowledge of consumers in China. To do so can raise their understanding of wine, and hence their WTP.

Both French and Chinese wine consumers are willing to pay for red wine that is sweet with a good body/monthfeel but less tannic. This represents the demand

from the consumers. It is debatable, then, why, at the supply side, the wineries and winemakers are not making wine that meets these criteria. Globally, most wine is made for early consumption. In Bordeaux, for example, the *en-premier* system makes available a significant amount of Bordeaux wine in the market early. Very few wineries have abdicated from the *en-premier* system and maintained their stock. From this *en-premier* selling tactic, it is suggesting that wine is for keeping, whether at the negociants or by the consumers. In China, due to the small volume of wine produced, many of the wineries sell all their stock in the first few years, for cash flow. While it is a trend for all the wineries to make wines for future consumption, the present study demonstrates that consumers in China and France prefer the Bordeaux-style French and Chinese wines to be more readily drinkable.

8.2.1 Marketing 1.0 – Product Marketing

This empirical study demonstrates that, once the tasting scene is set, the sensory quality of the wine is what drives WTP. It demonstrates that consumers' WTP is based on sensory qualities rather than objective factors like price, country of origin, and friends and family recommendations. Also, as demonstrated by the hypothesis testing on domestic and imported wines, both Chinese and French wine consumers are willing to pay more for higher-quality wine. Therefore, it is important for winemakers to enhance the real quality inside the bottle. Winemakers should focus particularly on sweetness, smoothness and mouthfeel, as these increase wine consumers' WTP.

From a marketing point of view, this study demonstrates the product attributes that today's consumer are interested in. It has already benefited the six wine producers in China and France, by informing them about the respective

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preferences of wine consumers for the six wines. It is believed that such preferences can be generalised to other wine producers in China and France, and help them to make wine that suits Chinese and French tastes.

In this study, Chinese WTP was higher than the French WTP, for all six wines. It would be sensible, therefore, at national level, for French wineries to target Chinese consumers. At the same time, the local wineries in China should also consider targeting the Chinese market instead of looking for international distribution.

8.2.2 Marketing 2.0 – Consumer Marketing

While the study focused in comparing wine consumers' preferences, the findings will be of benefit not only to producers, but also to on-trade and off-trade wine promotions to market Chinese and French wines to Chinese and French wine consumers. For example, sommeliers can recommend wines to Chinese and French wine consumers based on their preferences as revealed in this study, so as to increase the consumers' WTP and satisfaction with the ordered wine.

8.2.3 Marketing 3.0 – Value-Driven Marketing

Further, the experiment was based on a tasting experience, and preferences are examined by age and gender, by region or origin of the wine and by consumer knowledge. For on-trade off-trade promotional events with consumers, there should be dedicated staff to target sales towards younger French consumers and older Chinese women, as they have an increased WTP.

8.2.4 Market Segmentation

In this study, Chinese wine consumers could be differentiated by their level of knowledge. It is believed that people with less knowledge are willing to spend more on wine, but, at the same time, when they get too knowledgeable, their WTP decreases. Greater communication with consumers is recommended, and promoter and sales personnel could even ask consumers to self-evaluate their wine knowledge. From this, the promoter and sales personnel could gauge ideas about consumers' preferences and provide a catered solution at individual level based on consumers' WTP.

Another key implication is that wine educators in China should also be involved in the selling of the wines. The present study has made it clear that it is important to enhance the knowledge level of consumers, in order to increase their WTP. Wine educators should fill the gap, as wineries are not physically available or accessible in China. So for local or overseas wineries to target the Chinese market, it would be helpful to partner with educators. Interestingly, this is not the present selling model in Hong Kong or France, due to conflicts of interest.

From this study, it is easy to see why producers and negociants would be interested in targeting the China market for the sales of wine due to the substantial size of the consumer group and its high willingness to pay. Further, China is currently one of the top importers of red wine in the world by volume and imported value. But the barriers to entry, in the form of high import duty, VAT and consumption tax, make it difficult for wines to enter the Chinese market. Therefore, it is more attractive for high-value wines and big negociants who can bear the cost of entry to the Chinese market. Learning from this study, wineries and negociants from France with a portfolio of products can target

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particular segments of the China market with expensive wine products. At the same time, wineries and negociants can target the French market with inexpensive products. While younger French people demonstrate higher WTP for wines, and in the study French respondents also demonstrated preferences for imported wine, so wineries from China could sell commercial wines and promote wines in France that tailormade for the younger French segment. All in all, the study will help producers and negociants in targeting specific market segments with suitable products by multiple segment specialisation.

This study also provides food for thought regarding marketing to avoid ethical anti-consumption. During data collection in France at the ASPTT Tennis Club, several older French male respondents refused to participate in the tasting, as they objected to the idea of comparing Chinese wines with French wines. It is believed that they wrongfully thought that this research was a Judgement of Paris (Taber, 2006). Promoters and sales representatives must be mindful about the emotions of wine consumers, especially older consumers, and they should assess the situation before making wine recommendations.

8.3 Limitations

The comparative study was designed to investigate behavioural differences between wine drinkers in France and China. However, only English-speaking French were invited for the interview, and this, coupled with the limited geographical coverage - Paris, Bordeaux and Bourgogne in France, and Shanghai, Shenzhen and Chengdu in China - means the results will not be generalisable to the whole of China and France.

While different wines from different regions of China and France were used, the

sponsorship of these wines makes it impossible to control the quality, vintage and price range of wines used for the experiment.

Currently, none of the Chinese wines used in the experiment can be found in France. However, all the French wines used can be found in Hong Kong; only one of the three French wines, though, can be found in China. The barriers to entry are significant: by duty, consumption tax and VAT, as well as the logistical time and shipment costs. These factors have limited the availability of non-domestic wines in China and so limited the range of choice of wine.

Nevertheless, the hedonic-pricing analysis offers important theoretical insights into consumers' behaviour. It is important to bear in mind that the aim of hedonic-pricing regressions is not to gain a precise picture of consumers' real-life behaviour in the market (Thrane, 2004).

8.4 Further Research

This study is one of the first to attempt to derive French and Chinese consumers' preferences and WTP for French and Chinese wines. It is believed the opportunities for further research are numerous.

In an attempt to understand the cultural behaviour of French and Chinese consumers, the current study lacks the required resources to build in the cultural difference factors to test for causal relationships. Further research on wine consumers' WTP could be conducted to demonstrate how cultural difference is affected by Hofstede's five-dimensions, especially individualism and masculinity, using a hedonic-pricing model. To randomise the effect, the same research could be extended using the same wines across not only two countries, but a few more countries, to test the theory and characteristics of Hofstede's five-

dimensions. Doing so could also assess whether Hofstede's five-dimensions are still applicable today, given that the first edition of his book appeared in 1984.

This study compared Chinese and French wine consumers, to understand how Chinese consumers are different from wine consumers in other wine-producing countries of the world. Other Bordeaux varietal wines produced in the Barossa Valley of Australia, the Napa Valley of America and Tuscany in Italy could be included, further to the result of Cohen (2016), in a comparison of Chinese with Australian, Chinese with American and Chinese with Italian wine consumers.

While the younger French and older Chinese respondents in the present study had a higher WTP, it is believed that consumers' preferences are continually changing, especially as their knowledge level related to wine changes. A longitudinal study could examine how Chinese preferences and WTP change overtime. A paper entitled 'Chinese Millennials' WTP for Domestic and Imported Wines' was developed and presented at a conference; that paper is expected to be further developed into a journal article in due course.

The tasting results indicate that WTP increases when more information is available to consumers. The information condition changed from blind tasting to tasting with information on country of origin and region of origin and, finally, to tasting with full information. Results are statistically significant for both the Chinese and French respondents. Further research could adopt a four-stage process: first blind tasting, then tasting with country of origin information, then tasting with region of origin information, and finally tasting with full information. A control group could be used so that stages two and three could be exchanged to see how that affected WTP.

Section 2.7.1 and 2.7.2 raised the question of whether stated preferences and revealed preferences of consumers are different. A conference paper entitled 'Perceived and Revealed Attitudes Towards "Complexity" and "Flavour Development in the Glass": A Case of Inconsistency?' was developed and presented at a conference, and that paper is expected to be developed into another journal article.

In the present study, price negatively affected respondents' WTP. The price of the six wines used ranged from RMB97/ €12.8 to RMB484/ €63.9. These high prices may have sent unwanted signals about price to the respondents. Because of this, six wines of similar and more moderate retail prices could be used for the tasting research, similar to Lee et al. (2018). This might better reflect the WTP and preferences of wine consumers.

The study used OLS to generate the estimated values. Alternative estimation methods, such as ordered probit and ordered logit, could also be used. A further study comparing the estimated coefficients using all three estimation methods, similar to Peel et al. (1998) and Yang et al. (2012), could be performed and the different estimation methods might highlight hidden patterns.

Last but not least, alternative approaches linked to this thesis might include, first, demand analysis. The retail price information could be considered in conjunction with willingness to pay, to further explore consumers' demand under each price category, for each of the six wines used. This might help wine makers and retailers to make decision on final wine price. With this in mind, a report detailing information related to each of the six wines, the respective consumers' preferences, WTP, with demand analysis results have been provided to the six sponsored wineries. Second, artificial neural networks

(ANNs) could be employed in the data analysis. While the regression for WTP is assumed to be linear from the literature review, the data might reveal a different pattern by use of an ANN for non-linear regression. Such work is being considered with the ANN expert Wolfram Rinke of Fachhochschule Burgenland, in Austria.

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Appendix 1 – Pilot Study Questionnaire

Qualitative interviews in France and China

1. Can you tell me about what do you like about wine?

2. When you drink wine, what kind of sensory attributes do you prefer the most?

3. How about outside a bottle, what kind of objective attributes attract you most?

4. Let's consider you are buying a bottle of wine online or at a wine shop, when you purchase a bottle of wine, what would you be looking for?

5. From your point of view, is there a relationship between 'sensory and objective' factors and 'the price that you would like to pay' for a bottle of wine? Can you share more details?

6. What is the maximum amount you would be willing to pay for a 750ml bottle of wine? Can you tell me the reasons why you are willing to pay such an amount?

Sensory attributes

Aroma

Acidity

Sweetness

Alcohol content

Tannin

Wood taste

Balance (combination of sweetness, acidity and tannin)

Length and after taste (retain flavour on palate after you swallow the wine)

Mouthfeel (texture)

Smoothness

Complexity

Colour

Objective attributes

Brand name

Reputation

Award or medal winning

Country of origin

Region of origin

Friends and family recommendations

Grape variety

Labels, bottles, corks - look and feel (presentation)

Price

Wine critics' score

Age of wine / vintage

7. Could you please rank the 5 most important quality factors that you prefer when you choose what wine to drink? (1 most important > > > > 5, choose only 5 from the list. Add extra at your desire)

Brand name	Aroma
Reputation	Acidity
Award or medal winning	Sweetness
Country of origin	Alcohol content
Region of origin	Tannin
Friends and family recommendations	Wood taste
Grape variety	Balance (combination of sweetness, acidity and tannin)
Labels, bottles, corks - look and feel (presentation)	Length and after taste (Retain flavour on palate after you swallow the wine)
Price	Mouthfeel (texture)
Wine critics' score	Smoothness
Age of wine / vintage	Complexity
	Colour

Background questions

A. how long have you been drinking wine?   **Years**

B. how often do you drink? – tick by researcher

☐ Once a month

☐ Several times a month, but less than once a week

☐ Weekly

☐ Alternate days

☐ Everyday

C. how much do you normally pay for a bottle of wine?   **€ / RMB**

Simple demographics info – tick by researcher

    i. Gender   ☐male   ☐female

    ii. Interview is conducted in   ☐France   ☐China

    iii. Ethnic origin   ☐Chinese   ☐French

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Appendix 2 – Protocol of Tasting

Tasting Event Set Up[5]

Respondents: confirm at venue
Glasses: ISO glasses, water, spittoons and crackers
Pouring: Researcher and a helper to arrive 60-90 mins before tasting experiment
Storage of wine: Temperature controlled storage of the wines will be expected, with restricted access to the wines away from the tasting respondents.

Serving guide
Serving temperature controlled to 15°C ± 3°C.

(In case wines are stored at room temperature, to cool down in fridge for 20-25min before serving. If wine are stored in wine fridge (normally will be 12'C), it is preferred to take out 10 minutes prior to serving.)

Other service provision - post event cleaning of glasses and venue per session

Vinoteca room temperature
Please set to temperature at 18'C-21'C.

Experimental set-up
The volume of 15-25ml of wine for each of the wines will be ready for tasting before the respondents enter the **{vinoteca}.** A glass of water, crackers and spittoons will be provided, with a survey questionnaire expected to be filled in full by each of the respondents. Questionnaires use in China will be in Chinese. Questionnaires use in France will be in French.
Respondents will receive information about the three stages during the 30 mins tasting of the wines. With the questionnaires, ratings to the objective attributes and sensory attributes are recorded during the tasting of the 6 wines. Each session lasts approximately 30 to 60 mins.

Stages		Information provision
Stage one – **Blind taste**	Wine 1 – Chinese (A1) Wine 2 – French (Le Cleret)	Tasting of the wines, then rate the wines
Stage two – **Country of origin and region of origin information provision**	Wine 3 – Chinese (Li's) Wine 4 – French (Balac)	Country of origin and region of origin information are provided prior to the tasting of wine 3 & 4. Respondents then give ratings to the wines.
Stage three – **Full information provision**	Wine 5 – Chinese (Silver Heights) Wine 6 – French (Chateau Les Grands Chenes)	Full information related to the wine and bottle is provided prior to the tasting of wine 5 & 6. Respondents then give ratings to the wines.

The same wines with same vintage will be used for the tastings in all locations in France and China. All the tasting groups will be subjected to the same protocol in all the locations and under the supervision of the researcher.

A local language wine researcher will be arranged to help in answering questions during tasting.

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[5] Source: Combris et al. (2009).

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Appendix 3 – Main Study Questionnaire

Questionnaire on wine consumers' preferences and willingness to pay

Dear Sir and Madam,

How are you? I am a PhD student of The School of Hotel and Tourism Management, the Hong Kong Polytechnic University. I am conducting a research to understand French wine consumers' preferences and willingness to pay for wines. You are going to taste a total of 6 wines, 2 wines each under 'blind taste', 'taste with country of origin' and under 'full information' conditions. Please provide us with your preferences and willingness to pay on these wines. Information that you share to us will only be used for education purposes and will be privacy protected. Here we would like to ensure you are over the age of wine consumption in France.

I hereby verify that I am over 18 years old, and can legally purchase alcoholic beverages.
Signature
_____

Part I – to be completed before tasting
Wine consumption experience and wine knowledge level assessment

1. How often do you drink?
☐ Less than once a month
☐ More than once a month, but less than once a week
☐ More than once a week
☐ Usually everyday

2. How long have you been consuming wine?
My wine experience is _____ years

3. Have you had any formal wine education?
☐ YES, I have
      ☐ Academic experience – wine, oenology, wine management and other related degree
      ☐ Practical experience – WSET, sommelier training
      ☐ Others _____
☐ NO

4. Are you working in a wine related industry/sector (Such as winery, wine marketing and sales, wine distribution, wine service (such as sommelier or bar tender)?
☐ YES
☐ NO

5. On average, how much do you usually spend on a bottle of wine?

_____ EURO

6. Do you consider the <u>country of origin</u> of the wine when you choose a wine?
☐ YES
☐ NO

7. Do you consider the <u>region of origin</u> of the wine before you choose a wine?
☐ YES
☐ NO

8. How many bottles of wine your household purchased on monthly basis?

_____

9. How many person do you normally consume wine with?
☐ I drink alone normally
☐ 1 person
☐ 2 - 4 person
☐ 5 - 10 person
☐ More than 10 person

10. How long do you normally spent on consuming a bottle of wine from opening to finishing the bottle?
☐ N/A, never have a bottle of wine before
☐ Within 2 hours
☐ 2 to 4 hours
☐ More than 4 hours but less than 1 day
☐ 1 to 2 days
☐ More than 2 days

11. How many different bottles of wine do you normally consume in a meal?
☐ Less than1 bottle
☐ 1 bottle
☐ 2 bottles
☐ 3 bottles
☐ 4 bottles
☐ More than 4 bottles

12. Why you drink wine? Choose one of the below that best describe you
☐ I consumer wine because it can promote my health
☐ I consume wine because I am interested about the history and culture around wine
☐ I consume wine because I enjoy the feeling of slightly drunk (feeling of euphoria)
☐ Others, please specify _____ _____

13. When you are consuming wine, do you think about food and wine matching?
☐ YES
☐ NO

14. Your normal habit in consuming wine is
①_____% I consume wine on its own
②_____% I consume wine with food
①+②= 100%

15. Do you think 'flavour development in the glass' and 'complexity' are the same?
☐ YES
☐ NO

16. Please evaluate the importance of the following 11 external factors that may affect your quality assessment of red wine (7 is the most important, and 1 is the least important)

Importance of external characteristics	Most Important						Least important
	7	6	5	4	3	2	1
award-winning							
brand name							
reputation							
country of origin							
region of origin							
friends and family recommendations							
grape variety							
label and presentation, including bottle shape and cork design							
price							
critics' score							
vintage of wine							

17. Please evaluate the importance of these 13 colour, aroma and flavour characteristics that may affect your quality assessment of red wine (7 is most important, and 1 is least important)

Importance of colour, aroma & flavour characteristics	Most Important						Least important
	7	6	5	4	3	2	1
colour							
aroma							
acidity							
sweetness							
alcohol content							
tannin							
wood taste							
balance (combination of sweetness, acidity and tannin)							
length							
mouthfeel / body							
smoothness							
complexity / layered							
flavour development in the glass							

18. What kind of aroma and flavour characteristics mostly attracts you in red wine (Choose 3 from a to h, 1. most important, 2. second most important, 3. third most important)

1. _____, 2. _____, 3. _____

a. Floral (e.g. rose, violet)
b. Fresh fruits (e.g. strawberry, raspberry, cherry, plum)
c. Cooked fruits (e.g. cooked strawberry, dried prune)
d. Vegetal & herbal (e.g. green bell pepper, asparagus, leaf, mint, fennel)
e. Spice (e.g. white / black pepper, liquorice, juniper, anise, clove)
f. Oak (e.g. cedar, toast, smoke, vanilla)
g. Maturity and complexity (e.g. leather, earthy, mushroom, meaty, tobacco)
h. Others _____

19. Choose 5 out of the list of 24 characters (A to Z) below, which are the most important to you when you choose a red wine. (1. most important, 2. second most important,… fifth most important.)

1. _____, 2. _____, 3. _____, 4. _____, 5. _____

	External characteristics		Colour, aroma & flavour characteristics
A	award-winning	M	colour
B	brand	N	aroma
C	reputation	O	acidity
D	country of origin	P	sweetness
E	region of origin	Q	alcohol content
F	friends and family recommendations	R	tannin
G	grape variety	S	wood taste
H	label and presentation, including bottle shape and cork design	T	balance (combination of sweetness, acidity and tannin)
I	price	U	length
K	critics' score	W	mouthfeel / body
L	vintage of wine	X	smoothness
		Y	complexity / layered
		Z	flavour development in the glass

20. Below three questions are designed to confirm your level of knowledge in wine. If you do not know the answer, please make a wild guess:

20.1. Which of the following grape varieties are used for red wines?
☐ Chardonnay
☐ Pinot Noir
☐ Cabernet Sauvignon
☐ Riesling
☐ Merlot
☐ Pinot Gris
☐ Syrah

20.2. What is the level of alcohol by volume in red wines?
☐ 3-6%
☐ 7-10%
☐ 11-15%
☐ 16-19%
☐ More than20%

20.3. Can you evaluate your level of knowledge in wine:
(#7 – I am knowledgeable, #1- I am not knowledgeable)

	Knowledgeable					not knowledgeable	
Rating	#7	#6	#5	#4	#3	#2	#1
Please tick							

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Part II – Tasting experiment
Stage 1 – Blind taste

A.1. Please tell us your evaluation of the wine (7 is most desirable, 1 is least desirable

Wine 1

	7	6	5	4	3	2	1
colour							
aroma							
acidity							
sweetness							
Alcohol content							
tannin							
wood taste							
balance							
length							
mouthfeel / body							
smoothness							
complexity / layered							
flavour development in the glass							

Wine 2

	7	6	5	4	3	2	1
colour							
aroma							
acidity							
sweetness							
Alcohol content							
tannin							
wood taste							
balance							
length							
mouthfeel / body							
smoothness							
complexity / layered							
flavour development in the glass							

A.2. What is your willingness to pay (WTP) for each of these 2 wines?

Wine 1

	1	2	3	4	5	6	7	8	9	10	11
WTP (Euro)	7 or less	7-13.9	14-20.9	21-27.9	28-34.9	35-41.9	42-48.9	49-55.9	56-62.9	63-69.9	70 or more
Please tick one											

Wine 2

	1	2	3	4	5	6	7	8	9	10	11
WTP (Euro)	7 or less	7-13.9	14-20.9	21-27.9	28-34.9	35-41.9	42-48.9	49-55.9	56-62.9	63-69.9	70 or more
Please tick one											

A.3. Which is the five most important colour, aroma and flavour characteristics for your evaluation of these wines? Choose 5 out of the list of 13. (1. the most important, 2. Second most important…… 5th most important.)

1. _____, 2. _____, 3. _____, 4. _____, 5. _____

M	colour	T	balance
N	aroma	U	length
O	acidity	W	mouthfeel / body
P	sweetness	X	smoothness
Q	alcohol	Y	complexity / layered
R	tannin	Z	flavour development in the glass
S	wood taste		

Please drink some water and eat a few crackers before we move on to the next tasting.

Stage 2 of tasting - The origin information is provided

B.1. Please tell us your evaluation of the wine (7 is most desirable, 1 is least desirable)

Country of origin: <u>CHINA</u>   Country of origin: <u>FRANCE</u>
Region of origin: <u>Ningxia</u>   Region of origin: <u>Bordeaux</u>

Wine 3

	7	6	5	4	3	2	1
colour							
aroma							
acidity							
sweetness							
Alcohol content							
tannin							
wood taste							
balance							
length							
mouthfeel / body							
smoothness							
complexity / layered							
flavour development in the glass							

Wine 4

	7	6	5	4	3	2	1
colour							
aroma							
acidity							
sweetness							
Alcohol content							
tannin							
wood taste							
balance							
length							
mouthfeel / body							
smoothness							
complexity / layered							
flavour development in the glass							

B.2. What is your willingness to pay (WTP) for each of these 2 wines?

Wine 3

	1	2	3	4	5	6	7	8	9	10	11
WTP (Euro)	7 or less	7-13.9	14-20.9	21-27.9	28-34.9	35-41.9	42-48.9	49-55.9	56-62.9	63-69.9	70 or more
Please tick one											

Wine 4

	1	2	3	4	5	6	7	8	9	10	11
WTP (Euro)	7 or less	7-13.9	14-20.9	21-27.9	28-34.9	35-41.9	42-48.9	49-55.9	56-62.9	63-69.9	70 or more
Please tick one											

<u>Please drink some water and eat a few crackers before we move on to the next tasting.</u>

Stage 3 of tasting - Full information is provided

C.1. Please tell us your evaluation of the wine (7 is most desirable, 1 is least desirable)

Country of origin: <u>CHINA</u>
Region of origin: <u>Ningxia</u>

Country of origin: <u>FRANCE</u>
Region of origin: <u>Bordeaux</u>

Wine 5

	7	6	5	4	3	2	1
colour							
aroma							
acidity							
sweetness							
Alcohol content							
tannin							
wood taste							
balance							
length							
mouthfeel / body							
smoothness							
complexity / layered							
flavour development in the glass							

Wine 6

	7	6	5	4	3	2	1
colour							
aroma							
acidity							
sweetness							
Alcohol content							
tannin							
wood taste							
balance							
length							
mouthfeel / body							
smoothness							
complexity / layered							
flavour development in the glass							

C.2 What is your willingness to pay (WTP) for each of these 2 wines?

Wine 5

	1	2	3	4	5	6	7	8	9	10	11
WTP (Euro)	7 or less	7-13.9	14-20.9	21-27.9	28-34.9	35-41.9	42-48.9	49-55.9	56-62.9	63-69.9	70 or more
Please tick one											

Wine 6

	1	2	3	4	5	6	7	8	9	10	11
WTP (Euro)	7 or less	7-13.9	14-20.9	21-27.9	28-34.9	35-41.9	42-48.9	49-55.9	56-62.9	63-69.9	70 or more
Please tick one											

a. Gender
☐ Male
☐ Female

b. Age category
☐ 18-20
☐ 21-30
☐ 31-40
☐ 41-50
☐ 51-60
☐ Over 60

c. Education level
☐ No university degree
☐ University graduated
☐ Master, PhD or higher

d. Annual household Income

☐ Below 1,600 Euro	☐ 1,600 to 4,799 Euro	☐ 4,800 to 7,999 Euro
☐ 8,000 to 12,799 Euro	☐ 12,800 to 15,999 Euro	☐ 16,000 to 19,199 Euro
☐ 19,200 to 23,999 Euro	☐ 24,000 to 31,999 Euro	☐ 32,000 to 63,999 Euro
☐ 64,000 to 127,999 Euro	☐ over 128,000 Euro	

☐ Choose not to answer
☐ I don't know

e. Related to your experience in wine purchase (tick only one of the followings that best describe you)
☐ I buy dependent on price;
☐ I buy dependent on grape variety;
☐ I buy new wine products to try from time to time;
☐ I search for new products all the time, and I buy based on region of origin.

f. Related to your experience in wine consumption (tick only one of the followings that best describe you)
☐ I enjoy the alcohol in wine, don't have a drinking pattern.
☐ I drink regularly. I am loyal to brands.
☐ I drink regularly. I enjoy going to tastings.
☐ I taste and drink wine regularly.

g. Related to your experience in winery visits (tick only one of the followings that best describe you)
☐ I have not visited wineries.
☐ I have visited wineries before.
☐ I read books and magazines about wine, and visited wineries a lot.
☐ I am knowledgeable about wine and I visit wineries and go on wine tours a lot.

………THIS IS THE END OF THE QUESTIONNAIRE………
THANK YOU SO MUCH FOR YOUR PARTICIPATION

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