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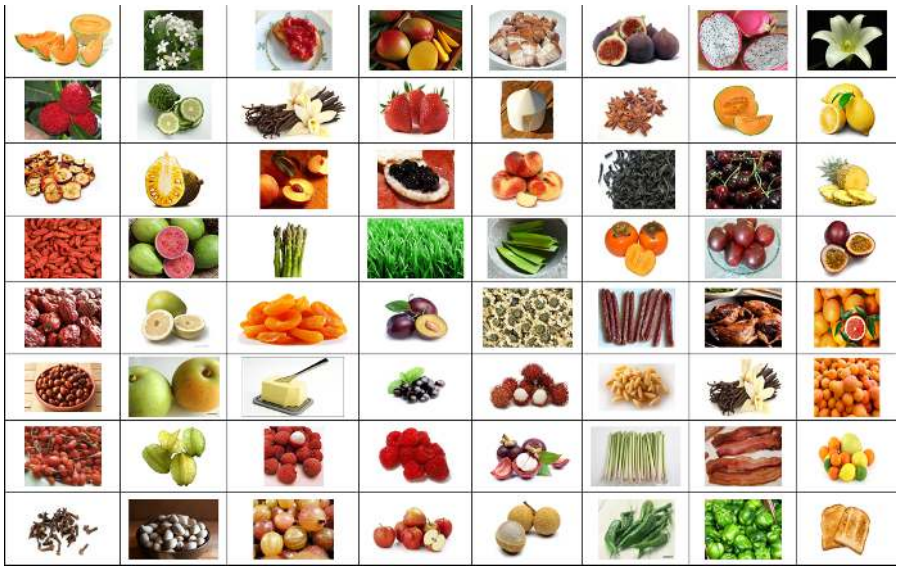
Australian Grape and Wine Authority

Understanding Chinese sensory preferences for varied wine styles and the language used to describe them



FINAL REPORT to

Australian Grape and Wine Authority

Project Number: **USA-1201**

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Research Organisation: **University of South Australia**

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1. ABSTRACT

This projects aims to understand both the Chinese consumer use of language to describe wines, grape varieties and flavours, and to measure the preferences existing Chinese wine drinkers have for the above. This is the first study to scientifically validate the lexical equivalence of Chinese and Western taste descriptors. It also refutes many commonly accepted notions regarding the breadth of the Chinese lexicon. This study validates the research protocol making it possible for further research to be conducted on other Australian wine styles and in other emerging wine markets that possess different cultural and linguistic backgrounds.

2. EXECUTIVE SUMMARY

The main results of this project can be summarised as follows:

1. This is the first study to scientifically validate the lexical equivalence of Chinese and Western taste descriptors, by testing some equivalences proposed by industry.
2. Generic descriptors are used more often than specific descriptors. The most commonly selected generic descriptors are smooth (平滑), fruity (果香), sweet (甜), mellow (醇), and lengthy aftertaste (回味).
3. The most prevalent specific descriptors perceived in a wine are related to commonly eaten fruits in China. The various vegetables, meats and spices descriptors proposed by wine experts are not yet utilised by Chinese wine drinkers.
4. When using specific Chinese descriptors, the most prevalent terms are:
    a. citrus fruits such as pomelo and lime for white and sparkling wines
    b. red fruits such as yangmei and dried Chinese hawthorns for red wines
    c. jackfruit and longan for dessert wines.
5. The majority of the hypothesised equivalences for specific Chinese and Western descriptors are confirmed across all wine styles:
    a. 8 out of 14 specific descriptors for the red wines & the South Australia tawny (nv)
    b. 11 out of 20 specific descriptors for the white wines, the sparkling wines and the 2012 King Valley Moscato
6. There is scant evidence that using Chinese or Western descriptors will impact likeability, willingness to buy or perceived price point, because Chinese wine drinkers tend to favour certain lexical terms. It is advised that a case-by-case decision be made on how to orient an Australian wine.
7. The wines that Chinese consumers like and are willing to buy are different from those they perceive as more expensive.
8. This study validates the research protocol making it possible for further research to be conducted on other Australian wine styles and in other emerging wine markets that possess different cultural and linguistic backgrounds.

This study was generously supported by the Australian Grape and Wine Authority. The research was executed by the Ehrenberg-Bass Institute for Marketing Science with contracted

support from the Australian Wine Research Institute and Wine Intelligence. A slide deck presentation of this report is available on the AGWA website http://research.agwa.net.au .

3. BACKGROUND

China is the number one destination for Australian bottled wine exports in Asia and is the third largest market for Australian global bottled wine exports by value (Wine Australia, 2012), with strong growth in recent years. While per capita consumption has doubled over the last five years, it is from a low base and is currently 1.0 L compared to the world average of 7L. As a relatively new to wine, highly diverse market with cultural and language issues for Australian wine producers, there is very limited information available on consumer behaviour. Taste preferences for this diverse market are not clear, with only anecdotal information available regarding any products apart from red wine, and with a wide range of possible styles and product types able to be produced in Australia, knowledge of preferred wine styles is required. Importantly, language used by Chinese consumers regarding wine is little understood, and it is not known how consumers respond to taste descriptors, packaging information or even varietal names, meaning communication and marketing strategies are hindered. We know that the Chinese use the term 'wine' loosely, often including spirits and rice-based beverages. Commonly used terms to describe wine flavours such as 'blackcurrant' may have no resonance with the Chinese at all, as they may be completely unfamiliar with such fruits or not concerned about specific taste descriptions in any way. Also, different names for the same grape variety may hinder communication and uptake in the Chinese market.

From previous work conducted in 2008 by the AWRI on Chinese taste preferences for red wines, it was found in a blind tasting that sweeter red wines with low acidity and astringency were generally preferred, with a large group of consumers reacting negatively to higher alcohol, stronger flavoured wines. It is not known how consumers respond to more lightly flavoured or sweeter styles than those tested in that study, nor how wines tasted with information might be responded to. There have been very limited studies published on Chinese wine consumption behaviour, with questionable reliability, either based on a small or a convenience sample of university students, mostly with data collected from one city only, with some studies not showing much clarity in distinguishing between expatriates and local Chinese consumers. Chinese consumers give high importance to previously tasting the wine and to recommendations; and country of origin and price appear as the most important cues when choosing a wine. Chinese wine consumers differ substantially from Western consumers in the way they respond to wine attributes, for example matching wine with food is not important (Lockshin et al., 2011). When comparing Chinese and Australian consumers, Osidacz et al. (2011) found that significantly more Chinese consume wines because of the believed health benefits, for the alcohol effects and to feel sophisticated. None have studied responses to wine descriptions or studied language and cultural factors related to communication of wine attributes.

Expanding export markets are critical for the Australian wine sector in the current climate of the high dollar and poor economic outlook in Europe and the US. A key barrier to rapid success in China is the lack of understanding of the consumer in China in terms of taste

preferences, descriptors, and attitudes to wine styles, so that producers can target wines to the appropriate market and communicate their attributes in a manner that is meaningful to the consumer.

The project will benefit the Australian wine industry from an economic perspective, as China is the most important and fastest growing export market for Australian wines, but Australian exporters do not know what the best terms are to describe their wines. This project provides clear guidelines to improve the communication of Australian wine styles for Chinese consumers. At the same time it highlights style preferences currently not exported by Australia. These two outcomes will increase the effectiveness of wine exports to China and allow Australia to take a clear lead in consumer communication. It also serves as a baseline to test preference changes in the future.

The main environmental benefits are indirect: reduced production of non-preferred wines and wine styles, and a more efficient production and marketing effort for Australian wine exporters to China.

The project will also benefit the Australian wine industry from a social perspective. The first benefit is a more united Australian marketing effort into China based on common knowledge of what Chinese consumers prefer, and what terms are best used to communicate these. In addition, there are advantages in bridging the gap between the production and marketing parts of the wine industry, as well as improved capacity of the wine industry to employ staff in rural areas due to increased exports to China.

4. PROJECT AIMS AND PERFORMANCE TARGETS

The project has two main objectives:

1) Understand the way Chinese consumers describe Australian wines, grape varieties and flavours:
    a. What is the language and lexicon that Chinese consumers use to describe the taste of wine and grape varieties?
    b. What language do Chinese consumers use to describe the following wine styles:
        i. Red wine?
        ii. White wine?
        iii. Fortified wine?
        iv. Sparkling wine?
    c. What are the common terms that resonate with consumers and should be used in further sensory analysis and to describe Australian wine styles in the future?
    d. What occasions do Chinese consumers associate with the different styles and flavours of the wines being tasted?
2) Understand what Australian wine styles Chinese consumers prefer?
    a. What intrinsic wine sensory attributes do Chinese consumers most prefer for sparkling, white, red and dessert wines?
    b. What extrinsic wine attributes do Chinese consumers most prefer for sparkling, white, red and dessert wines?

This section describes the output and performance targets from the project application

	Outputs	Performance Targets	Target Date
1	Develop a draft guide of key words that Chinese consumers use to describe Australian wine (four styles)	Understand the language Chinese consumers use to describe wines, grape varieties and flavours Run 12 x 1-hour focus groups in three Chinese cities (to be decided in consultation with AGWA). - Cross-validate findings with the draft lexicon developed by the University of Adelaide.	15/04/2013
2	Develop a draft industry guide giving a list of key characteristics of Australian wines that Chinese consumers prefer (four styles)	Conduct the quantitative component of the research (wine tasting for 300 consumers in the same three cities used for phase 1 of the research to measure the preferences Chinese consumers have for the Australian wines. Cross-validate findings with the draft lexicon developed by the University of Adelaide.	31/08/2013
3	Deliver an industry seminar in South Australia to at least 30	Develop seminar materials (e.g. slides, handouts, guide notes, checklists, …) for a two	15/11/2013

	businesses	hour workshop format Publicise, promote and stage the industry seminar	
4	Publish information describing project results	Prepare and publish articles describing key findings of the project including at least: • One trade magazine article • Two press releases • One Conference paper (e.g. AWITC), and • One refereed journal article (target A level publication	15/11/2013

3. METHOD

The project consisted of three separate stages: a qualitative stage, the selection of the wines for the quantitative stage, and the quantitative stage. The method applied in each of the three stages will be detailed below.

Stage 1: Qualitative study – Focus groups in China

The first stage of the project had the objective to identify the lexicon that Chinese consumers use to describe taste elements of wines. The wines were assessed in terms of acceptance and likeability, food matching suitability, consumption occasion and perceived price points.

This first stage of the research was conducted via focus groups. Focus groups are group discussions between a small group of people and are usually 1 – 1.5 hours long. In this research, product testing was included as a component of the exploration. Wine Intelligence, a recognised leader in market research, was commissioned to manage data collection. A Chinese moderator with wine experience ran the focus groups. The key advantage of this method is that it allows respondents to not only provide concrete measurements of preferences, but also their interpretation of their wine experiences. The findings from focus groups are commonly used to frame the design of further quantitative investigation, as was the case for this research.

The information gathered during the focus groups was fully audio-recorded and transcribed in multiple Word documents in Mandarin. In addition to this, participants were invited to write their thoughts and comments on some post-it notes and some multiple-choice tasks had been prepared to collect other information about the perception of the wines tasted by the participants. All this material was collected and used to produce a power point presentation of the results written in English. A slide deck presentation relative to this part of the research is available on the AGWA website. We invite the interested reader to access it via the following website http://research.agwa.net.au/

Twelve focus groups were conducted in three cities in China (Shanghai, Chengdu, and Guangzhou) between the 16th and the 22nd March 2013. The groups were kept to a small size of 4 people in order to make the moderation and maintenance of the wine evaluation feasible. The groups were split by gender (males or females) and age (25-30 years old or 31-50 years old) to account for the cultural nuances of China, thus guaranteeing that the participants were comfortable sharing their opinions.

All respondents were required to:

- Purchase and consume imported wine off-premise at least once a month for the past 6 months
- Consume imported wine on-premise at least 3 times in the past 6 months

- Typically spend RMB 150-400 (AUD 15 – 50) on wine (off-premise)
- Not buy wine predominately for gifting
- Be interested to taste Australian wines
- Be interested to try new and different styles of wine.

Table 1 below summarises the socio-demographic characteristics of the participants of the focus groups

Table 1: Socio-demographic characteristics of the participants of the focus groups

Variable	Levels	No. of participants
Gender	Male	24
	Female	24
Age	30 and below	24
	30+	24
City	Shanghai	16
	Guangzhou	16
	Chengdu	16
Total sample size		**48**

After a quick introduction and a warm up exercise devised to elicit discussion, participants were invited to write down everything that came to their mind when they thought about wine. All words or thoughts were written on different post-it notes. The moderator collected the ideas, grouped them on a board, and asked further questions for probing. Participants were then ask to think about a) how they would describe a wine to a friend, who never drank wine in his/her life, and b) what they would tell people about wine if they were working for a wine company.

The discussion continued by asking the following questions:

- When do you drink wine? Current frequency. Why?
- Please write down the wines you drink most often. [Moderator to prompt that they can write down countries, regions, varietals, brands]? Discuss what has been written down
- Where? Occasions; with whom?
- What do you look for at these occasions? How much would you spend?
- How important is the role of food in your wine choices?
- How important are awards? How do they learn about wine?
    - Can you list any wine critics?

This was followed by a wine testing session. Participants were invited to try four types of wine (a sparkling wine, a white wine, a red wine and a dessert wine) in sequence. For each type of wine, four labels had been selected, trying to include the main grape varieties, regions and wine styles Australia exports to China. The wines were organised in sets of four wines, one per type of wine, and the sets were randomly allocated for the focus groups. The wines therefore rotated across the four focus groups run in each city, for a total of sixteen wines tested in this first stage of the research. The sets were replicated in each of the three cities, thus guaranteeing a minimal, but fundamental level of generalisability of the results. Participants first tasted the wines blind and then the labels were shown.

Table 2 and Table 3 below show the wines used across the focus groups and the order in which the wines were served to the participants.

Table 2: List of wines used in the focus groups – By set

Wine	Set 1	Set 2	Set 3	Set 4
Sparkling wines	Coonawarra Sparkling Shiraz (nv)	Victoria Sparkling Rosè (nv)	South Australia Moscato (nv)	South Australia Chardonnay Pinot Noir (nv)
White wines	Margaret River Chardonnay 2011	King Valley Pinot Gris 2011	Claire Valley Riesling 2012	Adelaide Hills Sauvignon Blanc 2012
Red wines	Mornington Peninsula Pinot Noir 2011	Barossa Valley Grenache 2010	Barossa Valley Shiraz 2010	Margaret River Cabernet/Merlot 2010
Dessert wines	King Valley Moscato 2012	Riverina Botrytis Semillon 2008	South Australia Tawny (nv)	Rutherglen Brown Muscat (nv)

Table 3: Order of sets by focus group and by city

	Shanghai	Chengdu	Guangzhou
Group 1	Set 1	Set 4	Set 3
Group 2	Set 2	Set 1	Set 4
Group 3	Set 3	Set 2	Set 1
Group 4	Set 4	Set 3	Set 2

For each of the wines, participants were invited to taste the wine, answer a few questions in a questionnaire, and then discuss the wine before moving on to the next wine. The questionnaire included the following tasks/questions:

- Overall liking on a nine-point hedonic scale ('dislike extremely' to 'like extremely');
- Describe appearance;
- Describe taste;
- Describe smell;
- What consumption occasion would this be suitable for. With whom? Where? With what food?;
- Origin of the wine? Country / Region;
- Price perception.

After all the four wines had been tasted, participants were asked to rank the wines in order of preference and have a brief discussion about what they think the label might look like.

The section continued by providing participants with four lists of words, one per type of wine tasted, including fruits, vegetables, flowers, spices, and foods which can potentially be used to describe wines. Participants were asked to think about the wines they just tasted and tick all the flavours they thought they could perceive in the wines. Participants could try the wines twice if desired/necessary. Participants were also instructed that there were no right or wrong answers and that they could tick just those terms that they felt might be appropriate to describe flavours in the wine. The lists were developed from the descriptors Jeannie Cho Lee used in the book "Mastering the wine for the Asian Palate" (Cho Lee, 2011), and reduced to approximately 30 items per type of wine. The selection of the terms was done through consultation with researchers at the Ehrenberg-Bass Institute for Marketing Science, the Australian Wine Research Institute (AWRI), and Wine Intelligence. The list of descriptors was identical for sparkling wines, the white wines, the 2012 King Valley Moscato, and the 2008 Riverina Botrytis Semillon, while a different list was developed for the red wines, the South Australia tawny (nv) and the Rutherglen Brown Muscat (nv). Respondents also had the possibility to include terms that were not listed, or to cross out any term they found inappropriate to describe a wine.

Finally, participants were asked to assess the impact of the labels of the wines they just tasted. A picture including the four labels of the tasted wines was shown to them and they were invited to discuss whether the label matched how they described the wine before (e.g. did you expect wine X to have a label like this? Why / why not? What parts of the label give you clues as to what the wine might taste / look like?).

Stage 2: Selection of the wines for the quantitative stage

The aim of the second stage of the project was to quantitatively describe the sensory attributes of Australian red, white, sparkling, sweet white and fortified wines as part of a project that aims to assess the response of Chinese consumers to different styles of Australian wines and the way they describe them.

To achieve this objective, four small descriptive studies were conducted, one for each style of wine, in August-September 2013.

For the red and white wine studies, a panel of ten assessors (six females and four males) was convened. A panel of eight assessors (five females and three males) was used for the sparkling study, while nine assessors (six females and three males) evaluated the dessert wines. All the panellists are part of the AWRI trained descriptive analysis panel. Eight assessors attended all four studies.

For each study, the panel attended three to four training sessions to determine the most appropriate attributes to describe each sample set plus their definitions and reference standards. The panel then assessed the wines in a practice booth session before the formal sessions. Standards for aroma attributes were presented through all the studies. Details of the attributes used in the five studies and their definitions plus aroma reference standards are listed on pages 6-10 of Appendix II.

Three replicates of each sample were presented to panellists in 3-digit-coded, covered, ISO standard wine glasses at 22–24°C, in isolated booths under daylight lighting, with a randomised presentation order within each tray of samples across assessors. Assessors were presented with 30 mL of each wine with the six wines assessed in two trays of three wines per tray. Assessors were required to have a 45 second rest between samples plus a 15 minute rest between trays. During the 15 minute break assessors were requested to leave the booths and they were directed to a different booth for each tray.

The intensity of each attribute was rated using an unstructured 15 cm line scale from 0 to 10, with indented anchor points of 'low' and 'high' placed at 10% and 90% respectively. Data was acquired using Fizz sensory software (version 2.47, Biosystemes, Couternon, France).

Panel performance was assessed using Fizz, Senstools (OP&P, The Netherlands) and PanelCheck (Matforsk) software, and included analysis of variance for the effect of sample, judge and presentation replicate and their interactions, degree of agreement with the panel mean and degree of discrimination across samples.

Analysis of variance (ANOVA) was carried out using JMP 7.0 (SAS Institute, Cary, NC). Following ANOVA, Fisher's least significant difference (LSD) value was calculated ($P = 0.05$). When there were enough samples in the study, principal component analysis was conducted on the mean values of significant attributes averaged over panellists and replicates, using the correlation matrix. Otherwise, a spider/radar plot of the most important attributes was created.

Twenty-five wines (eight red wines, seven white wines, four sparkling wines, and six dessert wines) were assessed. Table 4 shows the list of wines selected for the final stage of the research.

Table 4: List of the wines used in the consumer test in China profiled by AWRI descriptive panel

Grape variety	*Vintage*	*Region*	*Code*
Sparkling			
Chardonnay Pinot Noir	2005	Yarra Valley	405
Zibibbo Rose	nv	North East Victoria	756
Moscato	nv	Australia	937
White			
Chardonnay	2011	Margaret River	291
Viognier	2012	South Australia	390
Sauvignon Blanc/Semillon	2011	Margaret River	448
Riesling	2012	Clare Valley	919
Red			
Shiraz	2010	Adelaide Hills	170
Pinot Noir	2011	Mornington Peninsula	283
Grenache	2011	McLaren Vale	396
Cabernet Merlot	2011	Margaret River	509
Shiraz	2010	Barossa Valley	912
Dessert			
Moscato	2012	King Valley	713
Tawny	nv	South Australia	946

Stage 3: Quantitative stage – Central location test in China

Wine tasting

The main objective of the quantitative stage of the project is to test the lexical equivalence between Chinese and Western descriptors. In addition, through this stage of the project we were able to:

- Identify the descriptors that Chinese consumers use to describe wines;
- Understand what wines Chinese consumers like the most, are most likely to purchase, and the wines' perceived price points;
- Understand which wine style was most likely to be consumed for a given consumption occasion.

To reach this objective, a central location hedonic liking test was conducted in three Chinese cities: Shanghai, Guangzhou, and Chengdu in August 2013. In order to qualify for the experiment, participants had to be between 18 and 50 years old, reside in the test cities, drink imported wine at least once per month, not be involved in the wine trade nor have participated in a wine tasting course or any other research study in the 3 months prior to the commencement of this research.

A total of 263 respondents completed the study. The majority of respondents were male (58%), 30-39 years old (49%), with a degree from a University (55%) and a personal income of less than RMB 7,000 per month (47%), and were equally distributed across the three cities.

A sensory research company with experience working with international clients in this field was recruited to execute the study with a member of the research team present during all wine preparation and data collection in all three Chinese cities. The data collection ran over four consecutive days in each location. The entire data collection was completed over a three-week period. Each day of data collection consisted of three sessions of approximately 75 minutes for each set of respondents. Respondents agreed to participate in two sessions, one per day over two consecutive days in order to manage their alcohol consumption and keep their palates as fresh as possible.

During each session, respondents evaluated seven wines divided in two blocks: 1) sparkling (3 types) and white (4 types) wines; and 2) red (5 types) and dessert (2 types) wines for a total of fourteen wines tasted by each respondent over two days. The list of wines was shown in Table 4.

Within each session, all respondents tried the sparkling wines before the white wines, and the red wines before the dessert wines. The allocation of the wines within each style was controlled by a randomised block design. The wines were presented monadically in three-digit coded wine glasses, each containing 30ml of wine with a confirmed temperature theshold for each wine style. Each respondent was given a two minute break between wines of the same style and five minute break between wines of different styles, with water

provided between each sample to cleanse the palate. At the end of each set of wines, some socio-demographic or psychographich information was collected (see Table 5).

Table 5: Sessions structure

DAY 1		DAY 2	
Time	**Activity**	**Time**	**Activity**
6 min	Sparkling wine 1	6 min	Red wine 1
2 min	Break	2 min	Break
6 min	Sparkling wine 2	6 min	Red wine 2
2 min	Break	2min	Break
6 min	Sparkling wine 3	6 min	Red wine 3
2 min	Break	2 min	Break
5 min	Socio-demo & psychographic questions	6 min	Red wine 4
6 min	White wine 1	2 min	Break
2 min	Break	6 min	Red wine 5
6 min	White wine 2	2 min	Break
2 min	Break	5 min	Socio-demo & psychographic questions
6 min	White wine 3	6 min	Dessert wine 1
2 min	Break	2 min	Break
6 min	White wine 4	6 min	Dessert wine 2
2 min	Break	2 min	Break
5 min	Socio-demo & psychographic questions	5 min	Socio-demo & psychographic questions

The surveys were designed in English, professionally transalated into Mandarin and then back translated by a third party into English to prevent translation bias. In order to prevent confusion in data collection, each evaluation was conducted on a separate piece of paper.

The wines were served at the following temperatures (see Table 6).

Table 6: Average serving temperature - By wine

Style	Avg. serving temperature	Wine ID No	Wine
Red wines	21.2	170	2010 Adelaide Hills Shiraz
	21.0	283	2011 Mornington Peninsula Pinot Noir
	21.3	396	2011 McLaren Vale Grenache
	21.4	509	2011 Margaret River Cabernet Merlot

	21.4	912	2010 Barossa Valley Shiraz
White wines	12.8	291	2011 Margaret River Chardonnay
	12.7	390	2012 South Australia Viognier
	12.8	448	2011 Margaret River Sauv. Blanc/Semillon
	12.9	919	2012 Clare Valley Riesling
Sparkling wines	9.7	405	2005 Yarra Valley Chardonnay/Pinot Noir Sparkling
	10.0	756	North East Victoria Zibibbo Rosè Sparkling (nv)
	9.8	937	Australia Moscato Sparkling (nv)
Dessert wines	12.9	713	2012 King Valley Moscato
	18.0	946	South Australia Tawny (nv)

The wine evaluation started with an overall liking of each wine on a nine-point hedonic scale (from 'dislike extremely' to 'like extremely'), and a question about the willingness to buy the wine on a five-point Likert scale ('definitely would not purchase' to 'definitely would purchase').

After this, a list of generic and specific wine descriptors was shown to respondents. After trying each wine, the respondents were asked to tick all the generic and specific wine descriptors they could perceive through tasting the wine. This technique is generally referred to as "Check-All-That-Apply" (CATA). The terms were listed on the survey instrument according to the Chinese Pynin system, which is the official phonetic system for translating the sounds of Chinese characters into Latin alphabet.The list of generic descriptors included eighteen terms commonly used to describe wines (see

Table 7).

Table 7: List of generic descriptors

Sour	Pure	Intense	Balanced
Mellow	Full bodied	Fruity	Oaky
Astringent	Bitter	Sweet	Pungent
Lingering	High alcohol	Refreshing	Spicy
Smooth	Light		

The list of specific terms was developed according to the results of a qualitative study. The list of Chinese terms and their Western equivalences applied in this quantitative study can be found in

Table 8 below.

Table 8: List of specific descriptors for the quantitative stage

RED WINES + SOUTH AUSTRALIA TAWNY (NV)	
CHINESE	**WESTERN**
Yangmei	Strawberry
Dried Chinese hawthorn	Blackberry preserve
Dried wolfberry	Strawberry preserve
Dried Chinese red dates	Plum
Fresh Chinese red dates	Blackcurrant
Fresh wolfberry	Raspberry
Clove	Clove
Star anise	Star anise
Chinese black tea leaves	Dark cherries
Persimmon	Red plum
Chinese sausage	Cooked game
Pine nut	Vanilla
Chinese salted pork	Bacon
Chinese green peppers	Green bell peppers

WHITE WINES + SPARKLING WINES + 2012 KING VALLEY MOSCATO	
CHINESE	**WESTERN**
Kaffir lime	Lemon
Jackfruit	Pineapple
Passionfruit	Guava
Pomelo	Grapefruit
Asian pear	Apricot
Star fruit	Citrus fruit
Ginko nut	Toast
Young Asian coconut	Vanilla
Saturn peach	Peach
Pandan leaf	Asparagus
Dried chrysanthemum	Dried apricots
Rambutan	Butter
Mangosteen	Lychee
Longan	Gooseberry
Cantaloupe	Melon
Lemongrass	Grass
Jasmine	Flowers
Dragon fruit	Apple
Mango	Mango
Yellow lotus seed paste	Figs

The respondents were only presented one of the two sets of specific descriptors – Chinese or Western – depending on their group allocation. The sets were also standardised for

respondents across both tasting sessions. The specific descriptors tested for each wine varied according to the wine style evaluated.

As one can see from Table 9 below, the sub-samples were equally split between cities and type of descriptors shown.

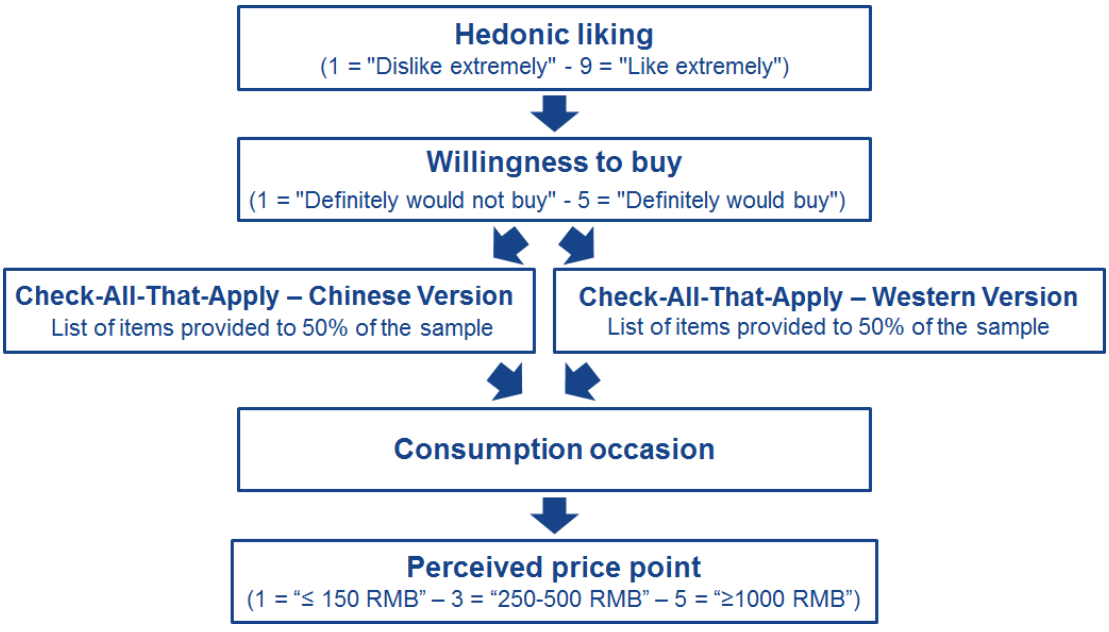
Table 9: No. of participants per type of descriptors respondents have been exposed

	Type of CATA	Respondents
Shanghai	CHINESE WESTERN	51 52
Guangzhou	CHINESE WESTERN	40 40
Chengdu	CHINESE WESTERN	41 39
Total		**263**

Finally, participants were asked to indicate the consumption occasion(s) when they would consume each wine via a multiple choice question, and the perceived price point of each wine on a five-point Likert scale ('$8 or below' to 'over $25').

Figure 1 below summarises the structure of the wine evaluation

Figure 1: Structure of the wine evaluation



The study followed a between-subject design, where the equivalence between Chinese specific terms and Western specific terms could be tested. Given that both groups evaluated the same wines, having the generic terms standardised across groups is an effective protocol to test the similarity of the groups as one would expect that the evaluation respondents give to the wines using the generic terms would be nearly identical. Upon confirmation of this, the way in which the respondents evaluate the wines based on specific descriptors can then be tested to validate which Chinese terms are statistically linked to their equivalences.

The results were first descriptively reported. However, different statistical techniques were applied to measure the differences between the respondents assigned to the Western and the Chinese treatments. The nature of these techniques varied in relation to the continuous or discrete nature of the dependent variables.

A general linear modelling (GLM) was applied to the scores relative to overall liking, willingness to buy, and perceived price points. A chi-square test was applied to measure the differences in frequency counts between Western and Chinese terms.

Correspondence analysis was used to test the equivalences between Western and Chinese terms. This multivariate statistical technique is conceptually similar to principal component analysis (PCA), but instead of using continuous variables, it is applicable to categorical data. As in PCA, the output of CA is a set of coordinates onto the *i* dimensions of a CA plot for each of the items included in the analysis (in our case wines and descriptors). For ease of interpretation, the plot is often reduced to two dimensions. However, differently from PCA, where each axis can be defined by the factor scores each original variable is loaded onto, the axes in CA have no other meaning than a bi-dimensional representation of the associations between the items displayed in the plot (Beh, 2004; Greenacre, 2007).

Given that both sub-samples evaluated the same wines, the cross-over of generic descriptors allows for validation of the similarity of the sampled groups. If the generic descriptors cluster around the same wines across sub-samples, one can conclude that the data is suitable for comparison of the lexical equivalence of Chinese and Western specific taste descriptors.

Discrete choice experiment

At the end of all the tastings (i.e. the last block of questions on day 2), participants were provided with a discrete choice experiment (DCE) aimed at testing whether Chinese wine drinkers prefer:

a) Visual or verbal representations of specific wine taste descriptors

b) Chinese or Western versions of specific wine taste descriptors

Furthermore, price points associated with the most preferred representations of wine taste descriptors were investigated.

The Chinese are known for being a visually learning culture (De Mooij, 2004; Tavassoli, 2002). Their restaurant menus are often pictorial representations of dishes. Observations made by the research team during multiple visits to China identified several wine retailers, supermarkets and on-premise outlets that used stickers of food items to designate flavour profiles of wines. However, these pictorial representations only utilised Western food products to typify taste descriptors. There is no evidence of this being applied yet with

Chinese food products. There is currently no known research that scientifically investigates this in the context of wine in China, until this study.

The DCE manipulated four product attributes for the creation of hypothetical wines with specific characteristics. These wines were arranged in choice sets. For each choice set, respondents had to select the wine they were most likely and least likely to buy for a dinner with business colleagues in a restaurant, where the respondents was selected to choose a bottle of red wine for the table to enjoy with the meal.

The attributes included in the experiment and their respective levels were:

a) **Descriptors by wine styles**: Selection of 4 mutually exclusive sets of specific descriptors

b) **Descriptors graphic appearance**: Visual or Verbal

c) **Descriptors language**: Western or Chinese

d) **Price**: RMB 260, RMB 500, RMB 740, RMB 980

These attributes and levels were combined according to a 4x4 Orthogonal Main Effect Plan (OMEP) design with sixteen choice sets and four alternatives to choose from in each choice set. In order to fit the experiment within the allocated time commitment of the respondents, each subject was allocated to eight of these sixteen choice sets. The choice sets shown to each respondent were selected via a Balanced Incomplete Block Design (BIBD), which generated six potential sets of eight choice sets each. Respondents were randomly allocated to one of these six sets. An example of a choice set used in the experiment can be found in Figure 2.

Figure 2: Example of choice set used in the DCE

葡萄酒	这款葡萄酒有以下特点:	价格 (RMB)	最可能购买	最不可能购买
1		740		
2	草莓, 丁香, 覆盆子 和 红李子	260		
3	鲜红枣, 柿子 和 中式咸猪肉	980		
4		500		

The data were analysed in terms of the frequency that the different attributes and levels were chosen and the results are presented in terms of the percentage difference between the number of times each attribute and level was selected as the most likely to be purchased and the least likely to be purchased.

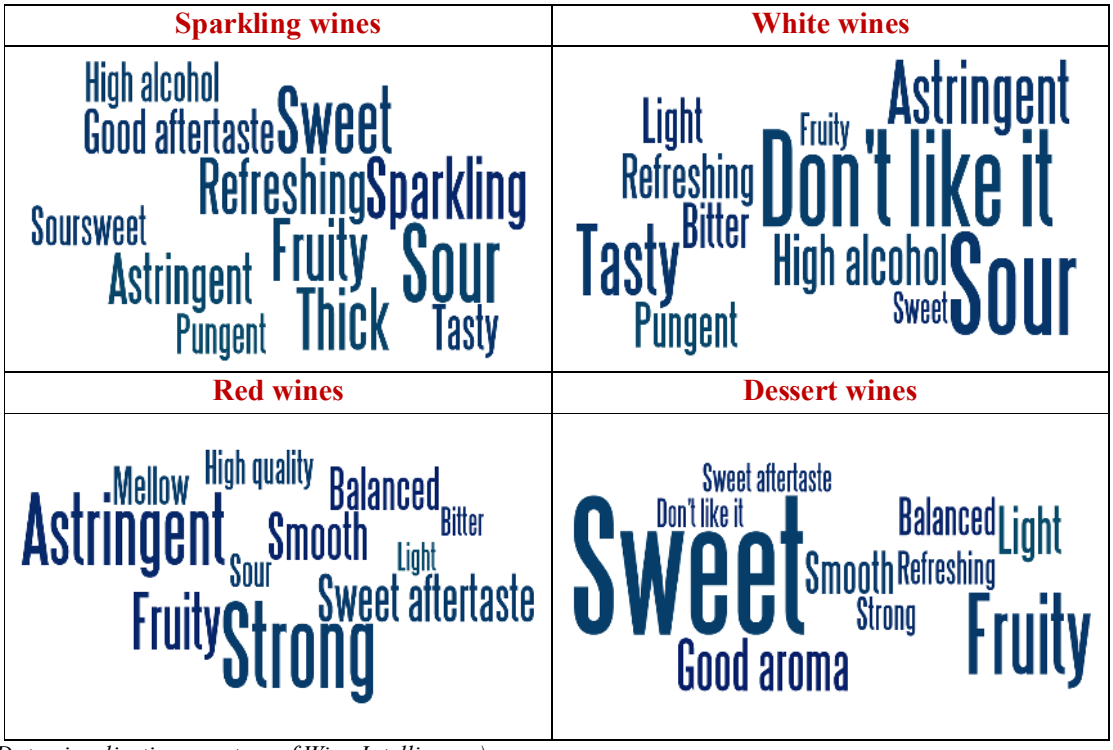
4. RESULTS / DISCUSSION

Stage 1: Qualitative study – Focus groups in China

The detailed results of the qualitative stage of the project are reported in Appendix I. However, we report here the key results which directly influenced the design and implementation of the last stage of the research.

The most common terminology applied was words such as "smooth", "fruity", "sweet", "mellow" and "lengthy aftertaste". Terms like "fresh", "soft", "pure", "good aroma" and "full-bodied" were elicited, but less frequently. Specific wine styles had more nuanced descriptions. **Error! Not a valid bookmark self-reference.** below illustrates the terms used by style and their relative size indicates their usage frequency.

Figure 3: Generic and non-culture specific taste descriptors – Classified by wine style



(Data visualisation courtesy of Wine Intelligence)

In relation to specific descriptors, the analysis revealed that fruit flavour descriptors were selected more frequently than vegetable flavour descriptors. Flavours such as "kaffir lime" and "pomelo" are dominant for both white and sparkling wines. Fruits such as "yangmei", "dried Chinese hawthorns", "dried Chinese red dates" and "fresh wolfberry" are most suited for red wine description. Fruits such as "longan" and "jackfruit" are the most prevalent descriptors when tasting dessert wines. Table 10 below contains a detailed listing of the terms elicited by wine style.

Table 10: The top 10 culturally-related flavour descriptors associated with wine – Classification by wine style

Sparkling wines	Count - %	White wines	Count - %
Pomelo	67	Kaffir lime	44
Kaffir lime	52	Pomelo	31
Jasmine tea leaves	23	Lemongrass	19
Guava	17	Guava	15
Jackfruit	17	Rambutan	15
Lemograss	15	Starfruit	13
Cantaloupe	13	Jackfruit	10
Star fruit	10	Gingko nut	10
Rambutan	10	Jasmine teas leaves	8
Dragon fruit	8	Yellow melon	8
Red wines	**Count - %**	**Dessert wines**	**Count - %**
Yangmei	42	Longan	38
Dried Chinese hawthorn	33	Jackfruit	38
Dried Chinese red date	31	Pomelo	29
Fresh wolfberry	27	Cantaloupe	23
Chinese black tea leaf	23	Mango	21
Dried wolfberry	23	Kaffir lime	21
Clove	21	Starfruit	19
Fresh Chinese date	19	Dragon fruit	15
Dried Chinese mushroom	8	Asian pear	15
Persimmon	6	Lemongrass	13

Stage 2: Selection of the wines for the quantitative stage

Appendix II reports the mean ratings for appearance, aroma, and palate attributes and significant effects for all the fourteen wines used for the final stage of the research.

Stage 3: Quantitative stage – Central location test in China

Wine tasting

Overall likeability, willingness to purchase, perceived price point, and consumption occasion

The first set of results are relative to the overall likeability, willingness to buy, perceived price point and preferred consumption occasion for the tested wines between the two sub-samples of the population. As participants were randomly allocated to one of the two treatments, it was important to test whether the two samples were comparable in relation to these variables. If one finds marked differences, then the equivalences cannot be verified.

As one can sees from Figure 4, the respondents had a slight preference towards the 2011 McLaren Vale Grenache, the 2011 Margaret River Cabernet Merlot, and the 2010 Barossa

Valley Shiraz over the the other three wines. However, the difference in overall likeability for each of the six wines is minimal between sub-samples. The statistical analysis conducted on the data confirmed this, with no statistically significant difference between the Chinese and Western conditions for each of the six wines.

Figure 4: Overall likeability for the red wines and the South Australia tawny (nv)

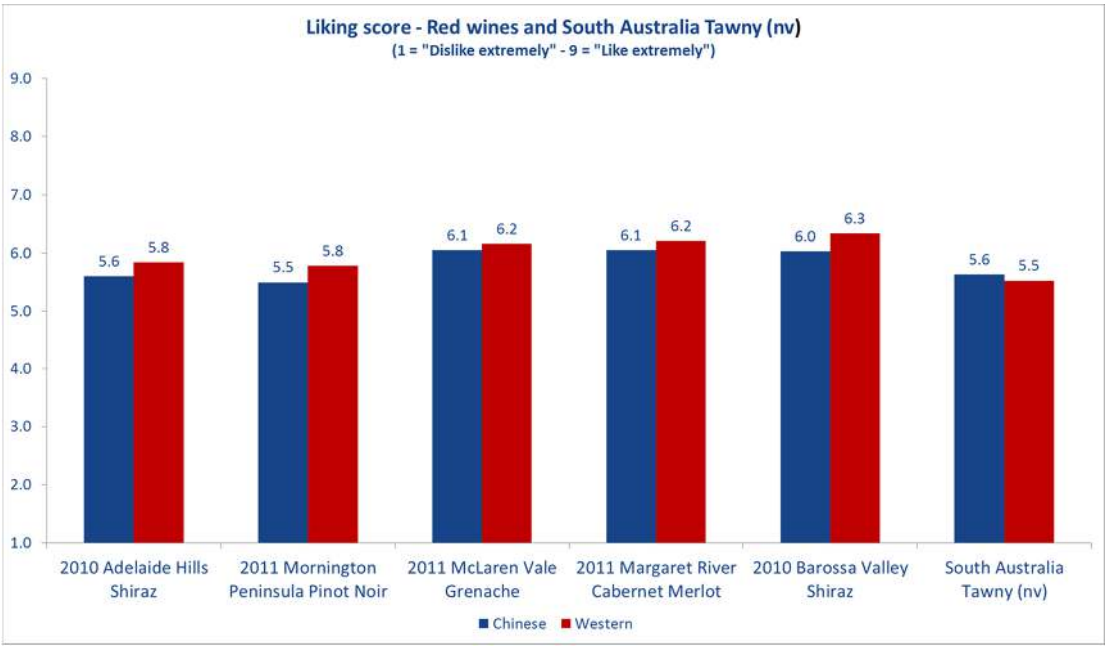
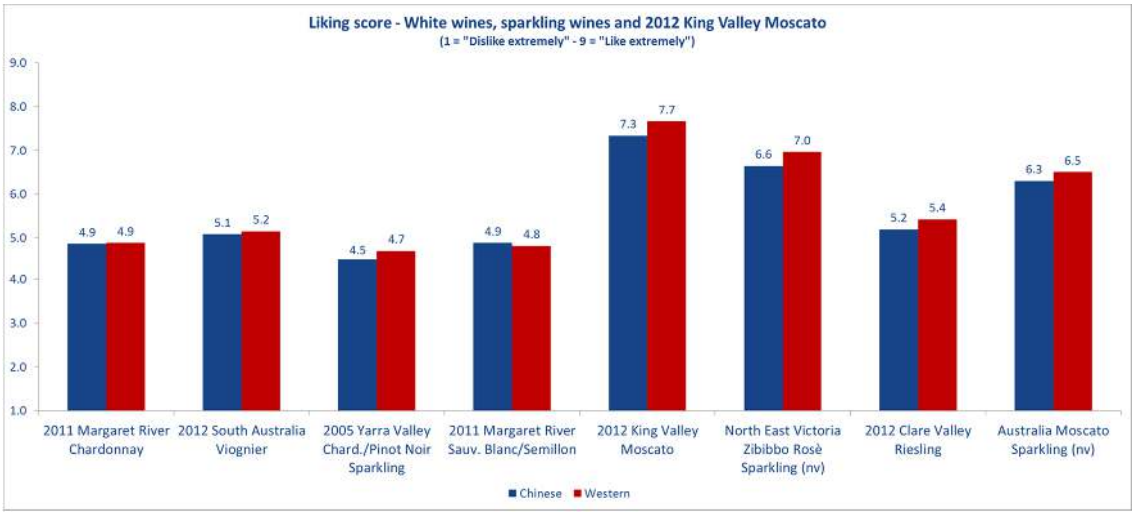


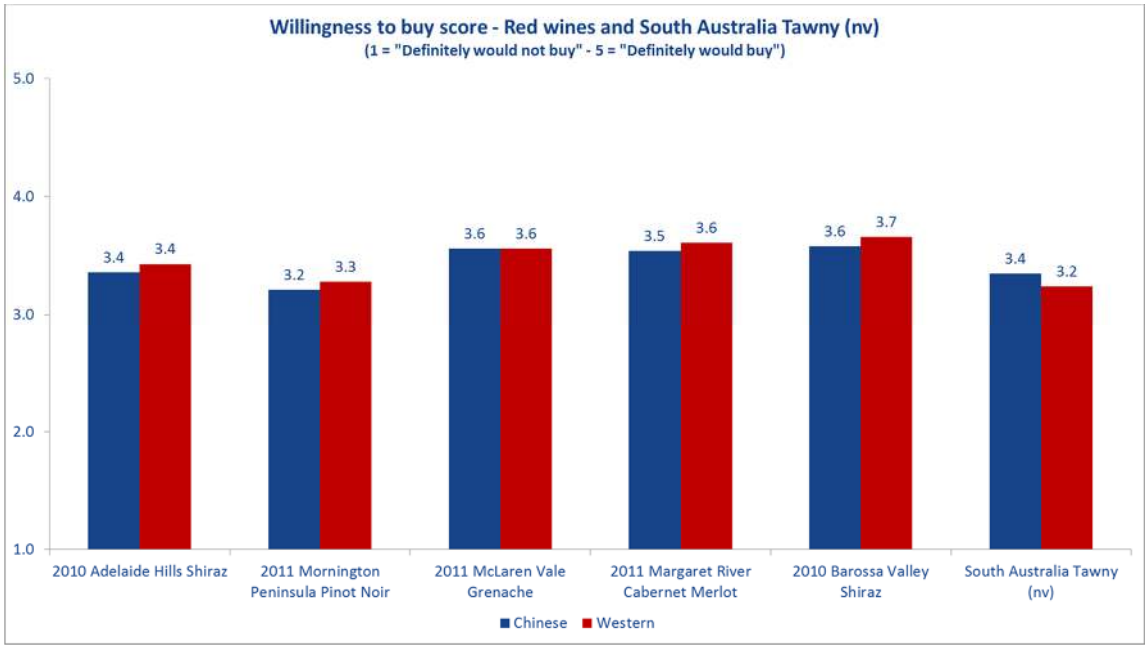
Figure 5 shows that participants had a marked preference towards the 2012 King Valley Moscato, the North East Victoria Zibibbo Rosé (nv) and the Australia Sparkling Moscato (nv) over the other still white wines and the 2005 Yarra Valley Chardonnay/Pinot Noir Sparkling. However, similar to the previous figure, the difference in overall likeability for these eight wines is minimal between sub-samples. The statistical analysis conducted on the data confirmed this, showing a statistical significant between sub-samples only for the 2012 King Valley Moscato and the North East Victoria Zibibbo Rosé (nv).

Figure 5: Overall likeability for the white wines, the sparkling wines, and the 2012 King Valley Moscato



As one can see from Figure 6, respondents are moderately willing to buy all six wines, and the statistical analysis performed on the data didn't show any significant difference between sub-samples.

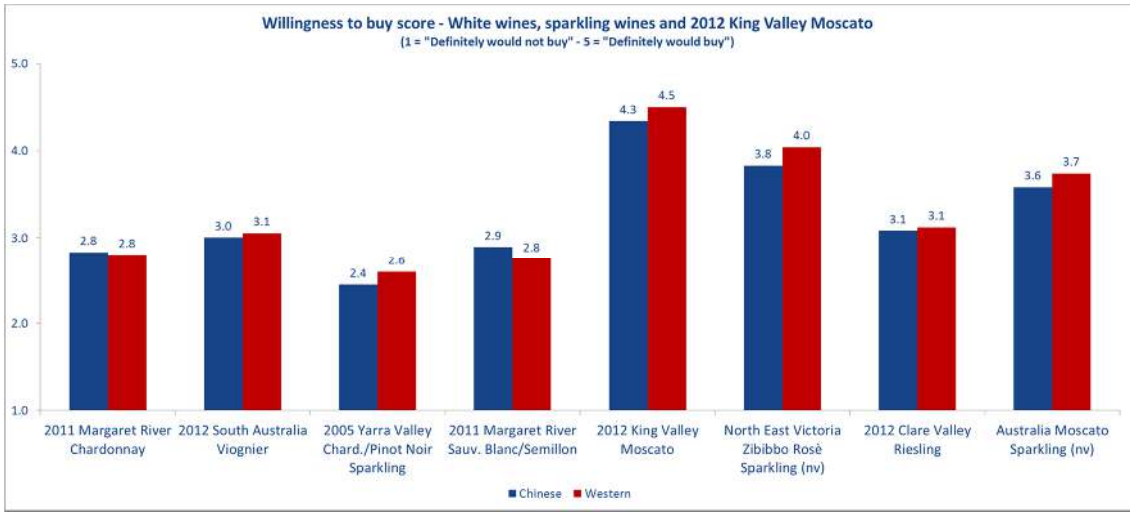
Figure 6: Willingness to buy the red wines and the South Australia tawny (nv)



Similarly to the overall likeability scores shown in

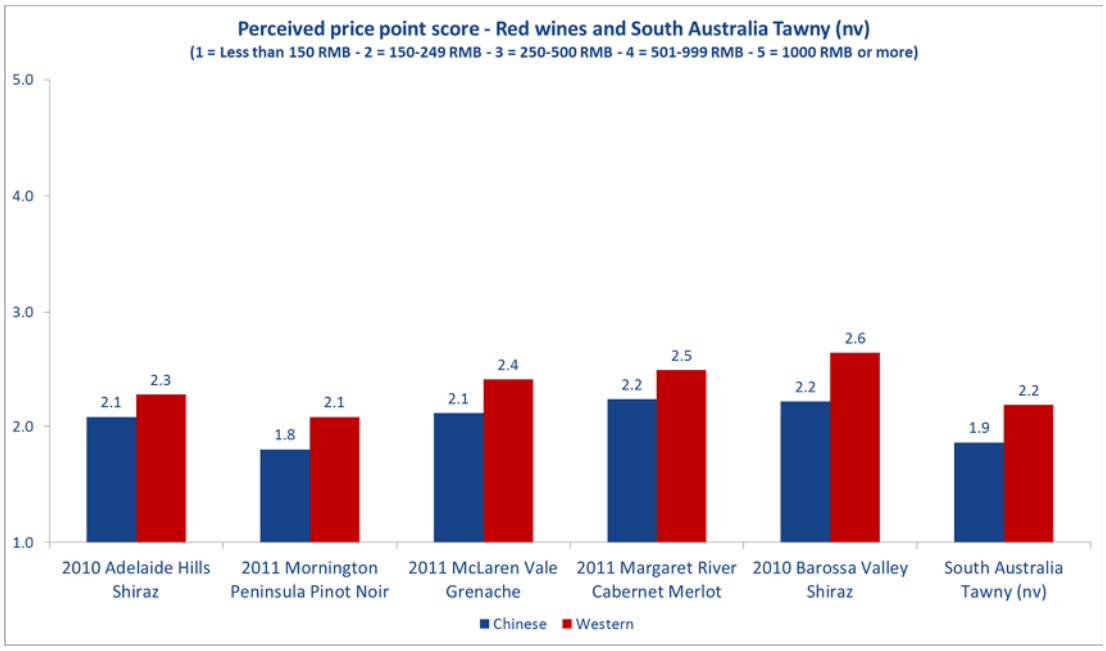
Figure 5, participants tended to be more willing to buy the 2012 King Valley Moscato, the North East Victoria Zibibbo Rosé (nv) and the Australia Sparkling Moscato (nv) over the other still white wines and the 2005 Yarra Valley Chardonnay/Pinot Noir Sparkling. However, the statistical analysis conducted on the data showed a statistical significant between sub-samples only for the North East Victoria Zibibbo Rosé (nv).

Figure 7: Willingness to buy the white wines, the sparkling wines, and the 2012 King Valley Moscato



The data in Figure 8 show that the Western sub-sample perceived the wines to be a little bit more expensive than the Chinese sub-sample. This difference was reflected in the statistical analysis where the 2011 Mornington Peninsula Pinot Noir, the 2011 McLaren Vale Grenache, the 2010 Barossa Valley Shiraz and the South Australia Tawny (nv) were perceived to be significantly more expensive for the Western sub-sample than for the Chinese sub-sample.

Figure 8: Perceived price point for the red wines and the South Australia tawny (nv)



Similarly to the red wines and the South Australia tawny (nv), the Western sub-sample perceived the wines to be a little bit more expensive than the Chinese sub-sample, but the difference here is even more subtle. The statistical analysis showed, in fact, that the Western sub-sample perceived only the 2012 King Valley Moscato to be significantly more expensive than the Chinese sub-sample (see Figure 9 below).

Figure 9: Perceived price point for the white wines, the sparkling wines, and the 2012 King Valley Moscato

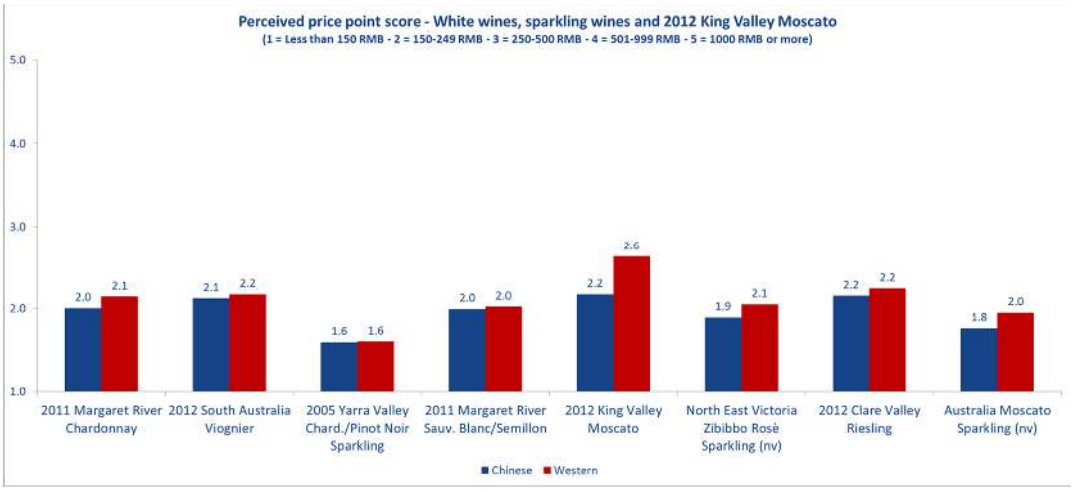


Table 11 shows a very close relationship between the wine style and the consumption occasion. Red wines seem to be more associated with a more formal occasion or a celebratory meal in a restaurant. White wines seem more suitable for an informal meal in a restaurant or a business lunch or dinner. The two Moscato and the Zibibbo are more suitable for an informal night out at a bar/café/club/karaoke, while the 2005 Yarra Valley Chardonnay/Pinot Noir

Sparkling and the South Australia tawny (nv) are more suitable for an informal meal in a restaurant.

Table 11: Most selected consumption occasion - by wine

Style	Wine & Occasion	
Red wines	2010 Adelaide Hills Shiraz	With a more formal or celebratory meal in a restaurant
	2011 Mornington Peninsula Pinot Noir	An informal night out at a bar/café/club/karaoke
	2011 McLaren Vale Grenache	With a more formal or celebratory meal in a restaurant
	2011 Margaret River Cabernet Merlot	With a more formal or celebratory meal in a restaurant
	2010 Barossa Valley Shiraz	With a more formal or celebratory meal in a restaurant
White wines	2011 Margaret River Chardonnay	With an informal meal in a restaurant
	2012 South Australia Viognier	With a business lunch or dinner
	2011 Margaret River Sauv. Blanc/Semillon	With an informal meal in a restaurant
	2012 Clare Valley Riesling	With a business lunch or dinner
Sparkling wines	2005 Yarra Valley Chardonnay/Pinot Noir Sparkling	With an informal meal in a restaurant
	North East Victoria Zibibbo Rosè Sparkling (nv)	An informal night out at a bar/café/club/karaoke
	Australia Moscato Sparkling (nv)	An informal night out at a bar/café/club/karaoke
Dessert wines	2012 King Valley Moscato	At a party/celebration/big night out
	South Australia Tawny (nv)	With an informal meal in a restaurant

Use of generic and specific wine descriptors

Together with overall likeability, willingness to buy, perceived price point and consumption occasion, participants were required to check all the generic and specific descriptors they were able to perceive in the wines they tasted. The tables that follow indicate the number of times each descriptor was chosen as a percentage score. It is important to remember that the generic descriptors were identical across both sub-samples and wines, with the exception of the descriptor "spicy", which was only present in the list for red wines and the South

Australia tawny. The specific descriptors were also different for different wine styles as indicated in

Table 8 above. Finally, the number of participants allocated in the Western and Chinese sub-samples was different. These three factors could lead to some descriptors being selected more times than others in absolute tems, thus biasing the interpretation of the results. For these reasons, it was decided to present the results as a perecentage score.

The results in **Error! Not a valid bookmark self-reference.** show that on average these generic descriptors are selected 22% of the times, with the terms “astringent” (34%), “sour” (34%), “mellow” (31%), and “lingering” (30%) being the most selected adjectives to describe the taste of the wines. These results are consistent with the findings coming from the qualitative stage in relation to the generic terms Chinese consumers identify most often when tasting a wine. Also, with the exception of the terms “sweet” and “pure”, the Western sub-sample tended to select more descriptors than the Chinese sub-group. For most of the terms, the difference is not statistically significant, but for the terms “astringent”, “fruity”, “smooth”, “intense”, “refreshing”, and “oaky” it is.

Table 12: Frequency count (%) – Generic descriptors

TERM	OVERALL SAMPLE	CHINESE	WESTERN	SIG.
Astringent	34	31	38	Y
Sour	34	33	35	N
Mellow	31	31	31	N
Lingering	30	28	31	N
Fruity	29	23	36	Y
Smooth	28	25	30	Y
Intense	25	23	26	Y
Refreshing	23	21	25	Y
Sweet	22	22	21	N
Pure	20	20	19	N
Full bodied	19	18	19	N
Bitter	18	18	18	N
High Alcohol	17	17	17	N
Light	15	15	16	N
Balanced	15	14	16	N
Oaky	14	12	17	Y
Pungent	12	11	13	N
Spicy	09	11	10	N
AVG.	**22**	**21**	**23**	

The second set of frequencies is relative to the specific terms. From a more general perspective, the results of Table 13 and Table 14 show that the specific terms are used less often than the generic terms across all wine syles. More specifically, the results for the red wines and the South Australia tawny (nv) showed that terms such as “yangmei”, “dried Chinese hawthorn”, “dried wolfberry”, and “fresh wolfberry” are used significantly more often than their Western equivalents. Conversely, other terms such as “dark cherries”, “red plum”, “cooked game”, “vanilla”, “bacon”, and “green bell peppers” are significanlty more used than their Chinese equivalents. As for the white wines, sparking wines, and the 2012 King Valley Moscato, showed that only the terms “Asian pear” and “pandan leaf” are used

significantly more often in the Chinese version. Other terms such as “lemon”, “grapefruit”, “citrus fruit”, “peach”, “lychee”, “gooseberry”, “grass”, “flowers”, “apple”, and “figs” are used significantly more than their Chinese equivalents.

Table 13: Frequency count (%) – Specific descriptors for the red wines and the South Australia tawny (nv)

IMAGE	CHINESE	%	IMAGE	WESTERN	%	SIG.
	Yangmei	15		Strawberry	4	**Y**
	Dried Chinese hawthorn	13		Blackberry preserves	8	**Y**
	Dried wolfberry	12		Strawberry preserves	4	**Y**
	Dried Chinese red dates	10		Plum	10	**N**
	Fresh Chinese red dates	10		Blackcurrant	9	**N**
	Fresh wolfberry	7		Raspberry	4	**Y**
	Clove	6		Clove	8	**N**

IMAGE	CHINESE	%	IMAGE	WESTERN	%	SIG.
	Star anise	5		Star anise	5	**N**
	Chinese black tea leaves	4		Dark cherries	14	**Y**
	Persimmons	4		Red plum	15	**Y**
	Chinese sausage	2		Cooked game	12	**Y**
	Pine nut	2		Vanilla	7	**Y**
	Chinese salted pork	1		Bacon	3	**Y**
	Chinese green peppers	1		Green bell peppers	4	**Y**

Table 14: Frequency count (%) – Specific descriptors for the white wines, the sparkling wines, and the 2012 King Valley Moscato

IMAGE	CHINESE	%	IMAGE	WESTERN	%	SIG.	IMAGE	CHINESE	%	IMAGE	WESTERN	%	SIG.
	Kaffir lime	13		Lemon	17	Y		Young Asian coconut	5		Vanilla	7	N
	Jackfruit	9		Pineapple	11	N		Saturn peach	5		Peach	8	Y
	Guava	6		Passion fruit	6	N		Pandan Leaf	4		Asparagus	2	Y
	Pomelo	8		Grapefruit	15	Y		Dried chrysanthemum	4		Dried apricots	5	N
	Asian pear	8		Apricots	4	Y		Rambutan	4		Butter	1	Y
	Star fruit	6		Citrus fruit	10	Y		Mangosteen	3		Lychee	10	Y
	Gingko nut	5		Toast	2	Y		Longan	3		Gooseberry	6	Y

IMAGE	CHINESE	%	IMAGE	WESTERN	%	SIG.
	Cantaloupe	3		Melon	4	**N**
	Lemongrass	2		Grass	11	**Y**
	Jasmine	2		Flower	9	**Y**
	Dragon fruit	2		Apple	10	**Y**
	Mango	2		Mango	3	**N**
	Yellow lotus seed paste	1		Figs	3	**Y**

Descriptors' equivalences testing

Before presenting the results relative to the correspondence analysis, it is important to point out that both sub-samples evaluated the same wines. Therefore, the cross-over of generic descriptors allows for validation of the similarity of the sampled groups. If the generic descriptors cluster around the same wines across sub-samples, one can conclude that the data is suitable for comparison of the lexical equivalence of Chinese and Western specific taste descriptors.

The results relative to the descriptors for the red wines and the South Australia tawny (NV) (Figure 10 and Figure 11) show that both groups of respondents evaluated the wines in a similar way, associating most of the generic and specific descriptors around the same wines. Wine 283, the 2011 Mornington Peninsula Pinot Noir, and wine 946, the South Australia tawny (NV), were perceived to be distintively different from the other wines – the 2011 Adelaide Hills Shiraz (170), the 2011 Mclaren Vale (396), the 2011 Margaret River Cabernet Sauvignon Merlot (509), and the 2010 Barossa Valley Shiraz (912).

Also, the majority of the generic descriptors (sixteen out of eighteen) associated with these wines are identical across the two groups, thus proving that at an aggregate level, respondents evaluated the wines in an identical way. Most of these descriptors cluster around wines 170, 396, 509, and 912, which are perceived to be smooth, pure, lingering, balanced, astringent, bitter, oaky, mellow, full bodied, intense, high in alcohol, and pungent. These wines represent the more traditional fruit-driven, full-bodied, high-alcohol wines that Australia became famous for worldwide. Wine 283, the 2011 Mornington Peninsula Pinot Noir, is perceived to be light, refreshing and sour. The only divergence between the two groups is relative to associations with wine 946, the South Australia tawny. The wine is perceived as sweet by both groups. However, the group in the Chinese descriptors' condition evaluated this wine as also being fruity and spicy, but in the Western descriptors' condition these two terms are more closely associated with the four still red wines.

For the specific descriptors, the hypothetised equivalences are verified for eight out of the fourteen descriptors used for for red wines and the South Australia tawny (NV). In particular, looking at the cluster containing wines 170, 396, 509, and 912, the Chinese terms "yangmei", "Chinese sausage", "Chinese green peppers", "persimmons", "Chinese salted pork", and "pine nut" are found equivalent to "strawberry", "cooked game", "Asian green peppers", "red plum", "bacon", and "vanilla", while the equivalence between "dried Chinese red dates" and "plum" does not seem to be supported.

The equivalences between "strawberry preserve" and "dried wolfberry" with "blackberry preserve" and "dried Chinese hawthorn" are supported as descriptors of the South Australia tawny (NV). However, the group who evaluated the wines with Chinese descriptors seem to associate more elements with the Australian tawny such as "fresh and dried Chinese red dates", "fresh wolfberries", "star anise", "Chinese black tea leaves", and "clove". These elements in the Western equivalent form ("blackcurrant", "plum", "raspberries", "star anise", "dark cherries", "clove", fruity and spicy) are instead clustered around the other four still red wines.

Table 15 and Table 16 summarise the equivalences for generic and specific descriptors between the Chinese and Western sub-samples for red wines and the South Australia tawny (NV).

Table 15: Equivalences of generic wine descriptors between the Chinese and Western sub-samples for the red wines and the South Australia tawny (NV)

TERM	EQUIVALENCE VERIFIED	TERM	EQUIVALENCE VERIFIED
Astringent	√	Pure	√
Sour	√	Full bodied	√
Mellow	√	Bitter	√
Lingering	√	High Alcohol	√
Fruity	X	Light	√
Smooth	√	Balanced	√
Intense	√	Oaky	√
Refreshing	√	Pungent	√
Sweet	√	Spicy	X

Table 16: Equivalences between Chinese and Western specific wine descriptors for the red wines and the South Australia tawny (NV)

RED WINES + SOUTH AUSTRALIA TAWNY (NV)		
CHINESE	WESTERN	EQUIVALENCE VERIFIED
Yangmei	Strawberry	√
Dried Chinese hawthorn	Blackberry preserve	√
Dried wolfberry	Strawberry preserve	√
Dried Chinese red dates	Plum	X
Fresh Chinese red dates	Blackcurrant	X
Fresh wolfberry	Raspberry	X
Clove	Clove	X
Star anise	Star anise	√
Chinese black tea leaves	Dark cherries	X
Persimmon	Red plum	√
Chinese sausage	Cooked game	√
Pine nut	Vanilla	√
Chinese salted pork	Bacon	√
Chinese green peppers	Green bell peppers	X

Figure 10: Correspondence analysis for the red wines and the South Australia tawny (NV) - Chinese version

Figure 11: Correspondence analysis for the red wines and the South Australia tawny (NV) - Western version

The results relative to the descriptors used for the white wines, the sparkling wines, and the 2012 King Valley Moscato are in line with the results relative to the red wines and the South Australian tawny (NV) (see Figure 12 and Figure 13).

Wines are classified in two main groups by both sub-samples. One group includes the 2012 King Valley Moscato (713), the North East Victoria Zibibbo Rosé Sparkling (756) and the Australia Sparkling Moscato (956); the other group comprises the 2011 Margaret River Chardonnay (291), the 2012 South Australian Viognier (390), the 2011 Margaret River Sauv. Blanc/Semillon (448), the 2012 Claire Valley Riesling (919), and the 2005 Yarra Valley Chardonnay/Pinot Noir Sparkling (405). In particular, all the generic descriptors match perfectly, with the sweeter wines perceived to be sweet, fruity, refreshing, balanced, smooth, pure, full bodied and light, while the other wines are perceived to be lingering, mellow, sour, intense, oaky, pungent, butter, astringent, and high in alcohol.

As for the specific descriptors, eleven out of 20 Western descriptors found equivalence in culturally-related descriptors. For the first three wines, 713, 756, and 937 – the terms “star fruit”, “peach”, “passionfruit”, “apple”, “pineapple”, “melon”, and “flowers” are found to be equivalent to “citrus fruit”, “saturn peach”, “guava”, “dragon fruit”, “jackfruit”, “cantaloupe”, and “jasmine”. As for the still white wines, the terms “grapefruit”, “figs”, “toast”, and “asparagus” are found to be equivalent to “pomelo”, “yellow lotus seed paste”, “gingko nut”, and “pandan leaf”. As for the other terms, while “kaffir lime” seems to be associated quite closely with the still white wines, the hypothesised equivalent term “lemon” sits between the two groups of wine, a situation opposite to that of “mango”, which is equally distant from the two groups of wines for the culturally-related group of respondents, while it is closely associated with sparkling and dessert wines for the Western group. The hypothesis that the terms “Asian pear”, “rambutan”, and “longan” are respectively equivalent to “apricot”, “gooseberry” and “butter” is also not supported as, while the Chinese equivalent terms group around the sparkling and dessert wines, the Western equivalent terms cluster around the still white wines. The same, however, reversed situation occurred with the terms “young Asian coconut” and “lemongrass”, which cluster around still white wines for the Chinese group, while the equivalent “vanilla” and “grass” cluster around sparkling and dessert wines for the Western group. Finally, while “mangosteen” and “dried chrysanthemum” seem to not belong to any of the two groups in particular, their Western equivalents “lychee” and “dried apricots” are associated with sparkling and dessert wines and still white wines respectively.

Table **17** and Table 18 summarise the equivalences for generic and specific descriptors between the Chinese and Western sub-samples for the white wines, the sparkling wines and the 2012 King Valley Moscato.

Table 17: Equivalences of generic wine descriptors between the Chinese and Western sub-samples for the white wines, the sparkling wines and the 2012 King Valley Moscato

TERM	EQUIVALENCE VERIFIED	TERM	EQUIVALENCE VERIFIED
Astringent	√	Pure	√
Sour	√	Full bodied	√
Mellow	√	Bitter	√
Lingering	√	High Alcohol	√
Fruity	√	Light	√
Smooth	√	Balanced	√
Intense	√	Oaky	√
Refreshing	√	Pungent	√
Sweet	√		

Table 18: Equivalences between Chinese and Western specific wine descriptors for the white wines, the sparkling wines and the 2012 King Valley Moscato

WHITE WINES + SPARKLING WINES + 2012 KING VALLEY MOSCATO		
CHINESE	**WESTERN**	**EQUIVALENCE VERIFIED**
Kaffir lime	Lemon	√
Jackfruit	Pineapple	√
Guava	Passion fruit	√
Pomelo	Grapefruit	√
Asian Pear	Apricots	X
Star fruit	Citrus fruit	√
Ginko Nut	Toast	√
Young Asian coconut	Vanilla	X
Saturn Peach	Peach	√
Pandan Leaf	Asparagus	√
Dried chrysanthemum	Dried apricots	X
Rambutan	Butter	X
Mangosteen	Lychee	X
Longan	Gooseberry	X
Cantaloupe	Melon	√
Lemongrass	Grass	X
Jasmine	Flower	√
Dragon fruit	Apple	√
Mango	Mango	X
Yellow lotus seed paste	Figs	√

Figure 12: Correspondence analysis for the white wines, the sparkling wines, and the 2012 King Valley Moscato - Chinese version

Figure 13: Correspondence analysis for the white wines, the sparkling wines, and the 2012 King Valley Moscato - Western version

Discrete choice experiment

The results of the discrete choice experiment demonstrate that participants tended to choose wines described with visual (+2%) Western terms (+12%), at a price of RMB 500 (~ AUD 80) for a dinner with business colleagues at a restaurant. In particular, the most preferred set of descriptors is the one displaying strawberries, cloves, raspberries and red plums as pictures (see Figure 14, Figure 15, Table 19, and Figure 16).

Figure 14: Percentage deviation from the mean - by language

Figure 15: Percentage deviation from the mean – by graphic appearance

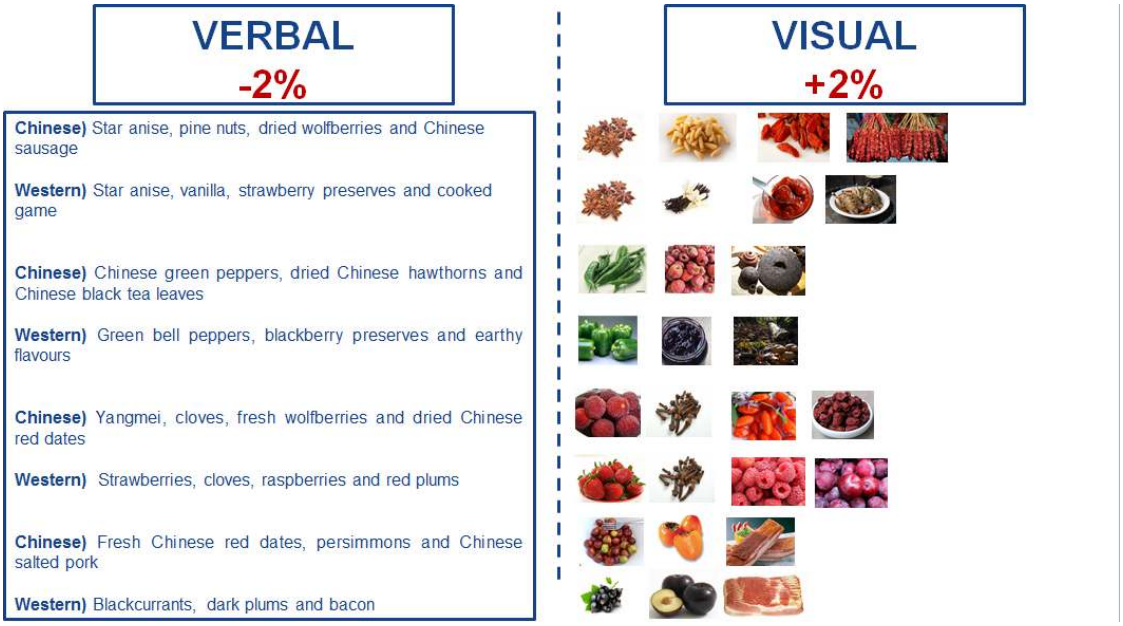


Table 19: Percentage deviation from the mean - by price

PRICE	%
RMB 260	+ 7
RMB 500	**+10**
RMB 740	- 2
RMB 980	-15

Figure 16: Percentage deviation from the mean – by wine style

Discussion

The results of this project proved that the intuition some industry practitioners had in creating a dictionary to "translate" the terms commonly used to describe a wine into, not just Chinese, but in the Chinese context and culture is forward-looking and not yet well accepted. However, an industry like that of wine which is so strategically vital for Australia cannot and should not just rely on the opinions of a few industry practitioners. Understanding how to describe wines to the relatively inexperienced consumers in a big country like China is a task to be scientifically approached.

The results of this study, in fact, showed that only some of the hypothesised equivalences hold true; others are not perceived as equivalent. This suggests the need to extend this study to test what Chinese descriptors match the Western descriptors that we did not find to be equivalent in this research.

One of the main advantages of this project is that the three-stage protocol developed here could be applied to any new or established export market, which is considered distant to Australian culture. The method could also be used in conditions where the climatic conditions and/or the food and wine traditions of a country would make it difficult for their consumers to match the descriptors (e.g. fruits, vegetables, spices, etc.) indicated in the back-label or other marketing collateral with the wines consumers taste and shop for. The protocol is robust, as it starts with a qualitative stage aimed at filtering all the unnecessary information and focusing on the most frequently mentioned descriptors by foreign consumers. This is then followed by a sensory characterisation of the wines, which ensures that the wines tested in a foreign market are representative of the main styles of wines Australia currently exports or intends to export. Finally, the quantitative stage scientifically validates the hypothesised equivalences. In this regard, the between-subject design, which allocates the participants into two independent samples, is fundamental to make sure that participants are not influenced by competing terms. At the same time, the presence of some descriptors (e.g. the generic ones) which are common across the sub-samples guarantee that the samples could be tested for comparability before the analysis is conducted.

Another interesting yet well-known fact is that familiarity with an object, in this case wine descriptors, leads to consumers selecting that object more often than when confronted with unfamiliar items. This research has shown that, despite the inexperience the participants of this study had with wine, the fact that Western descriptors have been the only one used thus far in China to describe wines might have involuntarily led to consumers finding more natural associations with Western descriptors for wine rather than Chinese descriptors. However, the predominance of Chinese descriptors over Western ones in relation to fruits proves that Chinese consumers might find it easier and more natural to talk about wine using descriptors that belong to their own culture and what they regularly consume. Further studies should investigate how the preferences for Chinese or Western terms change, as wine becomes more popular in China. In addition, context dependent research is required to understand better the influence of consumption situation on preference for Chinese versus Western terminology. In

the case of this research, Western terms were preferred in a business setting, which is seen as rather formal in China. However, it is unclear if there would be a shift in consumption at home. Results from Wave 2 of the China Wine Barometer (Project USA-1202) indicate that relaxing drinks at home are a prevalent consumption occasion in China. It could provide a competitive edge for Australian producers to understand what is the most suitable presentation of wine information and if this differs context to context.

Finally, in line with the results of project USA 09-01 (Sales impact of regional and environmental retail promotions) this project has shown that graphic descriptors are preferred over verbal descriptors, whether in Australia or China. The use of words, instead of images can still be considered more convenient on back labels due to the limited space. However, wineries should more carefully consider the use of images to describe wines in other marketing collateral, especially in the digital space or in-store activities, where images have been proven to attract more attention than words.

5. PROJECT OUTCOME AND CONCLUSIONS

Project performance against planned output

The following tables list performance targets as outlined in the project contract and later contract amendments.

Outputs	Performance Targets	Performance
Develop a draft guide of key words that Chinese consumers use to describe Australian wine (four styles)	Understand the language Chinese consumers use to describe wines, grape varieties and flavours Run 12 x 1-hour focus groups in three Chinese cities (to be decided in consultation with AGWA). - Cross-validate findings with the draft lexicon developed by the University of Adelaide.	Completed It wasn't possible to cross-validate the findings with the draft lexicon project developed by the University of Adelaide, as no results have been published out of their project
Develop a draft industry guide giving a list of key characteristics of Australian wines that Chinese consumers prefer (four styles)	Conduct the quantitative component of the research (wine tasting for 300 consumers in the same three cities used for phase 1 of the research to measure the preferences Chinese consumers have for the Australian wines. - Cross-validate findings with the draft lexicon developed by the University of Adelaide.	Completed. The sample was 263 respondents due to exchange rate variations, which reduced the sample size It wasn't possible to cross-validate the findings with the draft lexicon project developed by the University of Adelaide, as no results have been published out of that project
Deliver an industry seminar in South Australia to at least 30 businesses	Develop seminar materials (e.g. slides, handouts, guide notes, checklists, …) for a two hour workshop format Publicise, promote and stage the industry seminar	Completed. The seminar material has been prepared in the form of an 80 slide deck presentation which should be appended to this report. The publicity and promotion of the results of this project has already started with two webinars, discussed at conferences and will continue as soon as the report is released
Publish information describing project results	Prepare and publish articles describing key findings of the project including at least: • One trade magazine article • Two press releases • One Conference paper (e.g. AWITC), and	One trade magazine published, another two will be published in 2014 One press release published, and it is expected that another press release will be released once this

	• One refereed journal article (target A level publication	report is published One conference paper presented The journal paper is currently in draft format and it will soon be sent to an A level academic journal for consideration

Assessment of practical implications

The main practical implications of the project are:

- Generic terms (e.g. astringent, sour, mellow, lingering, etc.) are used by Chinese wine drinkers more often than specific terms (e.g. strawberry, yangmei, lemon, kaffir lime, etc.). Wineries should, therefore, describe their wines first via generic descriptors and then by specific descriptors.
- The equivalence of specific descriptors is verified for 11 out of 20 descriptors for white wines, sparkling wine and the 2012 King Valley Moscato, and 8 out of 14 descriptors for red wine and the South Australia tawny (nv). In addition, while Chinese fruits are associated more than their Western equivalent, savoury tastes are best suited for Western descriptors. Wineries can therefore decide to choose a Western specific descriptor to describe a wine or its Chinese equivalent for the descriptors where the equivalence holds, in relation to the type of specific descriptors wineries need to communicate.
- The use of Chinese or Western descriptors does not lead to a statically significant difference in likeability, willingness to buy and perceived price point. This is good news, as Chinese descriptors are hardly ever used in China to describe a wine; a lack of familiarity towards the Western terms in a wine description context could have led to a lower likeability, willingness to buy and perceive price point. Despite a current tendency to choose wines described in a Western context, the research shows that wines can introduce Chinese wine descriptors across all their marketing collateral without affecting the likeability, willingness to purchase, or perceived price point that Chinese consumers have towards Australian wines.
- The wines and relative generic and specific descriptors that are associated with willingness to buy and likeability differ to the associations with perceived price point. This implies that what consumers think is more expensive does not necessary match with what they like or what they are willing to buy. This requires Australian wineries and, more generally, the Australian wine industry to think about the types of wine to be exported to China. One could export the wines Chinese consumers already like, while trying to improve the perceived value of these products, or one could try to export the wines Chinese consumers find to be more expensive, while trying to improve the likeability and willingness to buy that Chinese consumers have for these products.

Benefits from the project

Economic benefits

This study sets the foundation for the Australian wine sector to take the lead in China by adapting its marketing communications to Chinese preferences. At the moment there is little evidence of exporters using Chinese sensory terms in training local resellers. This is an opportunity for Australian wineries to build stronger and more productive relationships with these channel partners. Done correctly and jointly, training channel partners in descriptors more easily understood should result in enhanced awareness and sales, especially at the high end. The long-term benefits should be an improvement in the acceptability of Australian wines and an increase in sales mainly due to distinctiveness in the market.

A secondary benefit is the working together among wineries, or perhaps within regions, to build a viable training and promotion scheme for Australian wines using native sensory descriptors where appropriate. There has been increasing disunity in the marketing of Australian wines compared to the heydays in the US and UK in the 1990s. A straightforward project to develop and then use Chinese-centric descriptors within the wine trade and eventually to Chinese consumers provides a structure to help unify Australian exporters in China. This enhanced unity should bear economic fruit for building the awareness of Australian wines in China.

Environmental benefits

The environmental benefits of this project are indirect. Improvements to the acceptable styles exported to China and improvements to the communication of Australian wine styles to the trade and consumers should increase the acceptability of Australian wines and reduce the export of unsuitable wines into China. Indirectly this increase in efficiency should reduce the production and impact of wines unsuited to the Chinese market.

Social benefits

The major social benefits stemming from this project are related to the second economic benefit discussed above. Australia has lost some of its unity in the shrinking of our two major export markets, the US and UK. This project offers to the opportunity for a wide range of wineries exporting to China to band together to create unique training and communication programs. The project through its overall economic benefits should improve the profitability of the wine sector and thus improve the social well-being in a number of wine regions.

RECOMMENDATIONS

The scientific validation of lexical equivalence and prevalence of usage can provide the Australian wine sector a competitive advantage in the Chinese market at two levels:

Industry level actions:

- AGWA should embrace the validated Chinese lexicon to describe Australian wine styles, in order to further our position as the leading wine country that orientates itself to the China market.

- Australian wine education and experience programs in China should be adapted to include an approachable lexicon for novice drinkers to aid acquisition of wine knowledge and the framework to share with others.

- Training programs in Australia should be developed to orient producers with Chinese taste descriptors to help wineries engage with Chinese consumers.

Producer level actions:

- Help Australian wine distributors improve wine communication in an omni-channel context in China through the use of a Chinese-inspired message with respect to taste profiles.

- Improve product footprint in on-premise, off-premise and online channels through adapted marketing collateral focused on engaging the Chinese wine drinkers in a Chinese-centric manner.

Future research should be aiming at extending this study to test which Chinese-specific descriptors match the Western descriptors that we have not found to be equivalent in this research. In addition, the robustness of the protocol suggests that Australia should apply it to any new or established export market, which is considered to be distant to the Australian culture. Finally, despite the lack of statistically significant differences in terms of likeability, willingness to buy and perceived price points measured between the two sub-samples, we suggest that future research should look at the effects that the use of culturally relevant descriptors have in terms of the ability of foreign consumers to discuss and share information about wine both in the off-line and on-line space. The popularisation and diffusion of the wine culture in the last 30 years in the Western world has certainly been favoured by an increasing number of people, magazines, retailers, and, more recently, bloggers talking about wine. There should be no reason why the same phenomenon could not happen in China or any other foreign market if the right words to talk about this product are found.

APPENDIX 1 – COMMUNICATION

The following table lists all project related communications ordered by time. The first column indicates those communications enclosed in the final report.

	Type	Topic	Audience	Location	Date
	Powerpoint presentation	Develop a draft guide of key words that Chinese consumers use to describe Australian wine (four styles)	AGWA, Wine Australia, Business & Trade	On-line	05/04/2013
	Webinar	Consumer Perceptions: What's new from China?	AGWA, Wine Australia, Business & Trade	On-line	26/11/2013
	Trade magazine paper	Developing a Chinese lexicon for wine	AGWA, Wine Australia, Business & Trade	Wine and Viticulture Journal, Vol. 28 No. 6, pp. 66-68	01/12/2013
	Powerpoint presentation	Develop a draft industry guide giving a list of key characteristics of Australian wines that Chinese consumers prefer (four styles)	AGWA, Wine Australia, Business & Trade	On-line	15/03/2014
	Webinar	Consumer Perceptions: What's new from China?	AGWA, Wine Australia, Business & Trade	On-line	01/04/2014

	Type	Topic	Audience	Location	Date
	Press release	Chinese Lexicon: Discovering wine descriptors for China	AGWA, Wine Australia, Business & Trade	On-line	12/06/2014
	Conference paper & presentation	Testing lexical equivalences for Chinese consumers: Do hawthorns taste like blackberries?	Marketing scientists	Paper presented at the 8th International Conference of the Academy of Wine Business Research, Geisenheim, Germany,	29/06/2014

Copy of published communications

Articles

- Corsi, A. M., Cohen, J., and Lockshin, L. (2014), 'Words are powerful: How are they used to describe wine in China?', *Wine and Viticulture Journal*, Vol. 29 No. 4, pp. 66-67.
- Corsi, A. M., Cohen, J., and Lockshin, L. (2014), 'Testing lexical equivalences for Chinese consumers: Do hawthorns taste like blackberries?', Paper presented at the 8th International Conference of the Academy of Wine Business Research, Geisenheim, Germany, 28th-30th June.
- AGWA (2014), 'Chinese Lexicon: Discovering wine descriptors for China' http://www.gwrdc.com.au/chinese-lexicon-discovering-chinese-wine-descriptors
- Corsi, A. M., Cohen, J., and Lockshin, L. (2013), 'Developing a Chinese lexicon for wine', *Wine and Viticulture Journal*, Vol. 28 No. 6, pp. 66-68.

Webinars

- Corsi, A. M., Cohen, J., and Lockshin, L. (2014), 'Consumer perceptions: What's new from China?', Webinar presented on the 1st April 2014 for the Wine Communicators of Australia. The video of the webinar can be retrieved on: https://www.youtube.com/watch?v=fL2Mu9ObO0s&list=UUGoaWS_meQV6VkSn1N5VZbA
- Corsi, A. M., Cohen, J., and Lockshin, L. (2013), 'Consumer perceptions: New China Insights?', Webinar presented on the 26th November 2013 for the Wine Communicators of

Australia. The video of the webinar can be retrieved on: https://www.youtube.com/watch?v=vUfpfST9L10&index=4&list=UUGoaWS_meQV6VkSn1N5VZbA

APPENDIX 2 – IP STATEMENT

There is no specific intellectual property developed from this research project.

All the methods developed were based on publicly available research in economics and marketing. The combinations used in this research were new, but all methods are provided in published articles.

APPENDIX 3 – REFERENCES

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APPENDIX 4 – STAFF LIST

The following persons were involved in the project:

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- Dr. Justin Cohen
- Prof. Larry Lockshin

The Australian Wine Research Institute

- Dr. Ian Leigh Francis
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APPENDIX 5 – BUDGET RECONCILIATION

End of project financial statement completed online on CIMS.