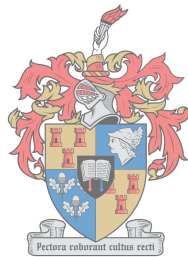# Consumer attitudes and sensory perceptions of wine: A South African cross-cultural study

by

Carla Jayne Weightman

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Co-supervisor: Prof. Dominique Valentin

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Declaration

By submitting this dissertation electronically, I declare that the entirety of the work contained therein is my own, original work, that I am the sole author thereof (save to the extent explicitly otherwise stated) that reproduction and publication thereof by Stellenbosch University will not infringe any third party rights and that I have not previously in its entirety or in part submitted it for obtaining any qualification.

Date: March 2018

Summary

The wine consumer landscape has changed in South Africa since 1994. Historically, some population groups had more access and greater cultural affinity for the product "wine", but such historical patterns are rapidly changing, particularly in urban areas. South Africa has a low per capita wine consumption, but industrial research has shown that there is potential for growth. The wine industry is therefore aiming to become more consumer-driven, in order to increase domestic wine consumption. Consequently, the need for consumer research has increased. Only limited published data is available on South African wine consumers and their consumption habits.

The general aim of this study was therefore to do a broad exploration of current wine consumers' perceptions of wine. This study had a few objectives, firstly to use focus groups to obtain a better understanding of South African wine consumers from different ethnic backgrounds (Black African and Caucasian), with a focus on perceptions, style preferences, context of enjoyment, purchase and consumption patterns, and journeys towards wine consumption. Secondly to develop a questionnaire in order to investigate motivations for wine consumption on a larger scale. Thirdly to compare consumers', trained assessors, and industry professionals' sensory perceptions of wine. Lastly to look at the influence of cultivar name on consumer liking.

The results of the focus groups showed that the predominant differences occurred between male and female consumers. With regards to ethnicity, this study did not reflect a large distinction between the different ethnic groups.

Overall, the wine choice questionnaire showed motivations for drinking wine between the consumer groups to be similar. The social, sensory appeal and ethical concern factors were the three most important motivational factors for South African wine consumers.

The industry professionals, trained assessors, and consumers gave very similar answers and distinguished between the sample set of wines in a similar fashion. Consumers that participated in this study mostly described themselves as novices and only somewhat knowledgeable. For them, knowing the cultivar name did not significantly change the way they described the samples, nor did it significantly alter their liking. Even though the samples were all different cultivars made in different styles, on average they were all received positively.

This is the first study to focus on understanding the changed landscape of SA wine consumers. The knowledge gained made a significant contribution towards a better understanding of South African consumers' perceptions of wine, and also highlights directions for future studies.

Opsomming

Die wynverbruikersprofiel in Suid-Afrika het verander sedert 1994. Histories het sekere populasiegroepe meer toegang en 'n groter kulturele affiniteit tot die produk "wyn" gehad, maar hierdie neiging verander tans vining, veral in stedelike gebiede. Suid-Afrika het 'n lae per kapita wynverbruik, maar industriële navorsing toon dat daar potensiaal is vir groei. Daarom strewe die wynindustrie daarna om meer verbruikersgedrewe te raak om sodoende huishoudelike wynverbruik te verhoog. Gevolglik het die behoefte aan wynverbruikersnavorsing toegeneem. Daar is tans 'n beperkte aantal gepubliseerde artikels oor Suid-Afrikaanse wynverbruikers se persepsies en hul verbruikersgewoontes.

Die oorhoofse doelwit van hierdie projek was dus om 'n breë ondersoek na die huidige wynverbruikersprofiel te doen. Hierdie studie het 'n paar doelwitte gehad; eerstens om fokusgroepe te gebruik om 'n beter begrip van Suid-Afrikaanse wynverbruikers van verskillende etniese agtergronde (Swart, Afrikaner en Kaukasiër, Wit) te kry, met spesifieke fokus op persepsies, stylvoorkeure, konteks waarin wyn gebruik word, aankoop- en verbruikerspatrone, sowel as die persoonlike reis na wynverbruik. Die tweede doelwit was om 'n vraelys te ontwikkel wat gebruik kan word om motiverings vir wynverbruik op 'n groter skaal te ondersoek. Die derde doelwit was om verbruikers, opgeleide wynevalueerders en industriekenners se persepsies van wyn te vergelyk en laastens om die invloed van "wynkultivar" op verbruikers se sensoriese persepsies en hedoniese ervaring van wyn te ondersoek.

Die resultate van die fokusgroepe het getoon dat die oorheersende verskille voorgekom het tussen manlike en vroulike verbruikers. Hierdie studie het nie groot verskille tussen die verskillende etniese groepe wat ondersoek is, se wynverbruikersprofiele getoon nie.

Oor die algemeen het die wynkeusevraelys getoon dat motiverings vir wynverbruik tussen die verskillende verbruikersgroepe eenders was. Die sosiale en sensoriese aanvaarbaarheid en kommer rondom etiese aspekte was die drie belangrikste motiveringsfaktore vir Suid-Afrikaanse wynverbruikers.

Vir die derde doelwit, naamlik die vergelyking van verskillende groepe se sensoriese persepsies en hedoniese ervaring van verskillende kultivarwyne, is daar gevind dat die industriekenners, opgeleide wynevalueerders en verbruikers soortgelyke antwoorde gegee het en dat die onderskeie groepe op dieselfde wyse tussen die stel steekproefwyne onderskei het. Verbruikers wat deelgeneem het aan hierdie studie het hulself meestal beskryf as beginners in wynverbruik en net ietwat kundig oor wyn. Om bewus te wees van die kultivarnaam (ingeligte proe) het nie die manier waarop verbruikers die wyne beskryf het, asook die hedoniese aanvaarbaarheid van die wyne noemenswaardig verander nie. Oor die algemeen is al die wyne positief ervaar, selfs al was elke wyn in 'n verskillende kultivarstyl geproduseer.

Hierdie is die eerste studie wat gestrewe het om die veranderende Suid-Afrikaanse wynverbruikersprofiel beter te verstaan. Die kennis wat opgedoen is het 'n aanmerklike bydrae gelewer tot die begrip rondom Suid-Afrikaanse verbruikers se persepsies van wyn en beklemtoon ook die rigting wat toekomstige verwante studies kan neem.

This dissertation is dedicated to
Janet Weightman

"I can't wait to get off the rollercoaster" *Janet*
"That which does not kill us, makes us stronger" *Friedrich Nietzsche*
"Just keep swimming, swimming, swimming" *Dory*
"I would like my straitjackets to be blue, and can my Mom have a pink one?" *Carla*
Wise words from 3-year-old Madison Grace Gilby "Carla, big girls don't cry"

Biographical sketch

Carla Weightman was born in Johannesburg, South Africa on the 6th of March 1991. She attended Beaulieu Preparatory School and matriculated at Beaulieu College in 2008. Carla obtained a four-year BSc-degree in Food Science in 2012 at Stellenbosch University. In 2013 Carla enrolled for an MSc in Wine Biotechnology at the Institute for Wine Biotechnology, Department of Viticulture & Oenology, Stellenbosch University. After the successful completion of her masters she decided to further her studies and enrolled for a PhD.

Acknowledgements

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Preface

This dissertation is presented as a compilation of 6 chapters. Each chapter is introduced separately and is written according to the style of the Journal of Wine Research, to which Chapter 3 was submitted for publication.

Chapter 1   **General Introduction and project aims**

Chapter 2   **Literature review**
Consumer perception and preference

Chapter 3   **Research results**
Exploratory study of urban South African consumers' perceptions of wine and wine consumption: focus on social, emotional, and functional factors

Chapter 4   **Research results**
Development of a Wine Choice Questionnaire for the investigation of consumers' motivations for wine consumption

Chapter 5   **Research results**
Consumers', trained assessors', and wine professionals' sensory perceptions of a set of dry white wines

Chapter 6   **General discussion and conclusions**

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Chapter 1

Introduction and

project aims

1. General introduction and project aims

1. General Introduction

The South African wine consumer landscape has changed over the last 20 years. Industrial research has shown that there is definite potential to grow the South African domestic wine market, and the first step in doing so is for producers to understand their consumers (Basson, 2014). The general aim of this project was therefore to do a broad exploration of current wine consumers' perceptions of wine.

In 2014 project WISE was started in South Africa. WISE stands for wine industry strategic exercise and it has six broad aims: economic empowerment and development, market development and promotion, social development and upliftment, knowledge and information development, training and development, and technology innovation and transfer (Basson, 2014). One specific point of interest is growing South Africa's domestic market. South Africa has a very low per capita wine consumption when compared to other wine producing nations (Opperman, 2010; SAWIS, 2016) and industrial research by the consumer insights agency (CIA) and The Moss group (The Moss Group, 2005) showed that there is potential for growth, and identified specific consumer segments with such potential (Consumer Insights Agency, 2014; The Moss Group, 2015). Their take home message for the industry was that understanding consumers better will be key to growing the market.

Much of South Africa's wine research conducted at the Department of Viticulture & Oenology at Stellenbosch University has focussed on chemical and sensory profiling of wine made using different wine making techniques, occasionally with the addition of consumer acceptance testing but not as the main focus (Aleixandre-Tudo, Weightman, Panzeri, Nieuwoudt, & Du Toit, 2015; Botha, 2015; Coetzee, 2014; Hanekom, 2012; van Wyngaard, 2013; Weightman, 2014). There is very little published research regarding South African wine consumers. In 2009 a study looked at the rising black middle class consumer group referred to as 'black diamonds' and their wine consumption (Ndanga, Louw, & Rooyen, 2009) and in 2010 Opperman (2010) looked at marketing strategies for this emerging black consumer group. Three studies have evaluated generation Y regarding importance of wine attributes (Lategan, Pentz, & Du Preez, 2017), their perspective on sparkling wine (Charters et al., 2011), and consumer opinions of quality of Pinotage (Vannevel, 2015). Until now there has been no research that focused more broadly on South African consumers' perceptions of wine.

This study focussed on the two largest wine consuming population groups in South Africa which are urban black and white groups. The white consumer group historically were the largest group

of wine consumers. However, since the dissolution of Apartheid in 1994, the market has transformed, and black consumer groups now account for approximately 80% of the wine consuming population (South African Audience Research Foundation, 2014). Despite this transformation, little research has gone into investigating recent consumers' perceptions of wine, and to see whether marketing approaches should be adapted.

For this study qualitative research by way of focus groups was conducted to explore South African consumers' perceptions of wine. The results of the focus groups then fed the development of a Wine Choice Questionnaire (WCQ) which was used to investigate consumers' motivations for wine consumption on a larger scale. This questionnaire was based on the original Food Choice Questionnaire (Steptoe, Pollard, & Wardle, 1995) which is an established tool used to measure motives related to food choice.

Sensory analysis is also an important part of consumer research used to investigate and meet consumers' taste expectancies (Piggott, 2012). Sensory analysis serves as a link between product characterisation and consumer reactions (Varela & Ares, 2012). In recent years, the global food industry has focused on scientifically evaluating consumer opinions and sensory perceptions. Using consumers for sensory analysis provides non-expert opinions, and these opinions can be considered as providing the most direct indication of consumer preferences and future consumption patterns. In the wine industry, however, most sensory analysis is done with industry professionals or trained descriptive analysis panels. However, are the opinions of these panels representative of consumer perceptions? And do consumers understand these descriptions and interpret the sensory properties of wine in the same way? This study therefore looks at comparing the sensory perceptions of industry professionals, trained assessors, and consumers using a set of white South African wine varietals.

The South African Department of Science and Technology funded this project which aimed to get a better understanding of current South African wine consumers, focusing on their perceptions, preferences, and motivations for wine consumption. This is one of the first academic studies to investigate South African consumers' perceptions of wine, and the results of this project will firstly contribute to a better understanding of South African consumer groups and secondly contribute to the wine industry's larger aim of becoming more consumer-orientated in order to grow the domestic market.

2. Problem statement and research questions

2.1 Problem statement

Wine is an important part of South Africa's heritage and the industry is of great economic importance. In the past the wine industry has largely focused on the export market, however it has identified growing the domestic market as a priority (Loots, 2017). The domestic market has also changed over the last 20 years (since 1994), and faces strong competition from other alcoholic beverages, particularly beer (SAWIS, 2016). The wine market which (for political reasons) used to be made up of predominantly white consumers, is now dominated by black African consumers. Together the black and white ethnic groups make up 91% of South Africa's total wine consuming population.

For the South African wine industry to become more consumer driven, understanding consumers needs and what motivates them, will be of the utmost importance. This research should focus not only on investigating consumers' perceptions of taste and smell, but also how wine makes them feel (Meiselman, 2015; Schouteten et al., 2015; Spinelli, Masi, Dinnella, Zoboli, & Monteleone, 2014; Vidal, Giménez, Medina, Boido, & Ares, 2015). This work will also contribute to academia in terms of aiding in refining methodology and work flow for consumer research in general.

There is limited scientifically validated and published data on South African wine consumers, and no research regarding current wine consumers' general perceptions of wine. The aim of this study was therefore to contribute to a broader understanding of South African wine consumers' attitudes, perceptions, and preferences, with a focus on the two largest wine drinking ethnic groups in South Africa.

3. Project aims

The specific aims and related tasks of this study were to generate scientific data and gain insight into South African consumers' perceptions of wine and motivation for wine consumption. The following objectives were identified:

3.1 Investigate consumers' attitudes towards/ perceptions of wine
  a) Conduct focus groups to get a broad understanding of wine market
  b) Thematic content analysis of transcripts to identify themes

3.2 Develop a questionnaire for investigating consumers' motivations for wine consumption

    a) Using the results from the focus groups, adapt the food choice questionnaire to a wine choice questionnaire.

    b) Use the questionnaire to investigate South African consumers' motivations for wine consumption.

3.3 Compare sensory perceptions of trained assessors, industry professionals and consumers

    a) Descriptive analysis (DA) with trained assessors

    b) Free Description with industry professionals

    c) Check-All-That-Apply (CATA) with consumers

    d) Compare the results of DA, free description and CATA

        • Determine RV coefficients

3.4 Investigate the influence of cultivar name on consumer liking

    a) Consumer liking under both blind and informed conditions

4. Experimental design

This research is presented as three separate research chapters. Figure 1 depicts the experimental design for this study. For chapter 3, focus groups were conducted with the aim of investigating consumers' general perceptions of wine. Through thematic analysis several themes emerged which combined with the insights from the literature review (Chapter 2) formed the basis for chapters 4 and 5.

Chapter 4, was the development of a wine choice questionnaire, which was an adaptation of the Food Choice Questionnaire by Steptoe et al. (1995). The questionnaire probed motivations for wine consumption which were identified during the focus groups.

With fast moving consumer goods, and especially a luxury product like wine, sensory perception and sensory appeal is always important. In Chapter 5, the sensory perceptions of trained assessors, industry professionals and consumers were compared. The same set of white wines belonging to three different white cultivars was used. Descriptive analysis was done with the trained panel and free description was done with the industry professionals. The industry professionals were also asked for their opinion on the sensory differences between the three chosen cultivars. From those results a Check-all-that-apply (CATA) list with the most used terms was drawn up. Consumers used this CATA list to describe the same set of white wines. In

addition to this, the influence of cultivar name on consumer liking was also investigated (Figure 1).
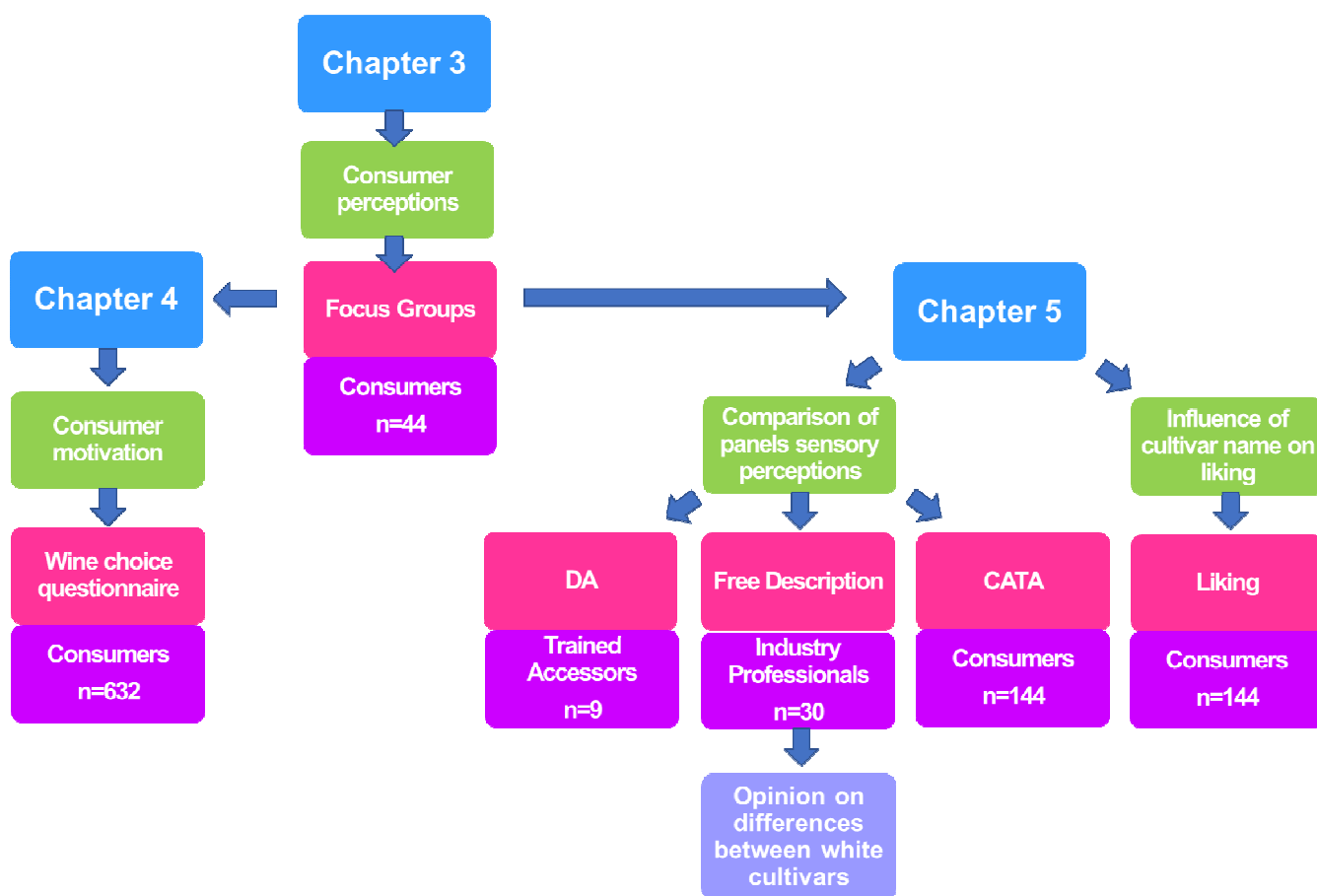
Figure 1 A summary of the experimental design split by research chapter.

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Chapter 2

Literature review

Consumer perception and preference

Chapter 2: Consumer perception and preference

1. South African wine consumer landscape

When compared to other wine producing countries, South Africa's wine consumption is extremely low at just 7.5 L per capita. Competition in the alcohol industry has grown and wine as a product category has seen increased competition from spirits (whisky and the increasing popularity of craft gins), ready to drink (RTD's) alcopops and ciders, and the rise of craft beer and microbreweries. There are numerous craft beer and gin festivals as well as speciality beer and gin bars, and food pairings are also no longer limited to wine. Some of the craft beer brewers have started to experiment with food and beer pairings and Brewers association.org has developed a beer and food matching chart (CraftBeer.com, 2015). Beer also accounts for more than 70% of the total volume of alcohol consumed in South Africa (Table 1)(SAWIS, 2016). This is followed by RTD's (which have increased in popularity) at 10.6% and account for a larger percentage of the market than wine at only 8.2% (Table 1).

Table 1 Change in percentage of total sales of alcoholic beverages in South Africa split by category (Holtzkampf, 2016; SAWIS, 2016).

	2006/2007	2014/2015
Spirits	3.3	2.8
Wine	8.2	8.2
Fortified Wine	0.8	0.7
RTD's	8.6	10.6
Beer	79.1	77.7
Total	100.0	100.0

Globalisation is also increasing competition for the wine industry. Wines and other alcoholic beverages from all over the world are now easily available in many supermarkets. Wine imports in South Africa are on the rise, and have increased from 10 790 942 L in 2013 to 16 364 690 L in 2015 (SAWIS, 2016).

South Africa also experienced a change in the consumer landscape. Due to political reasons the wine market was historically dominated by the white population group. However, since the dissolution of Apartheid just over 20 years ago, this has changed as consumers of other population groups, who were previously denied consumption, are now participating in, and have started to dominate this market.

After observing the changes in the market over the last 20 years, the wine industry decided to pay closer attention to domestic consumers in order to stay competitive. Consequently, in 2014 the South African wine industry (in collaboration with The Moss Group and Consumer Insights Agency) launched a project aimed at revitalizing the domestic South African wine market. This formed part of the Wine Industry Strategic Exercise (WISE).

The results of the WISE research showed that there is definite scope for growing the domestic wine market (Basson, 2014). Several consumer segments with potential for growth were identified. These segments were based on the Consumer Insight Agency's Now Project's consumer archetypes (The CIA project, 2014, Figure 1). The segmentation was based on wealth, education, lifestyle and living standards mean (LSM) groupings. LSM was developed by the South African Audience Research Foundation and is extensively used in Southern African market research (South African Audience Research Foundation, 2016). It is a tool which divides the population into 10 groups, (10 being the highest and 1 the lowest) based on criteria such as degree of urbanisation and ownership of cars and other major appliances.
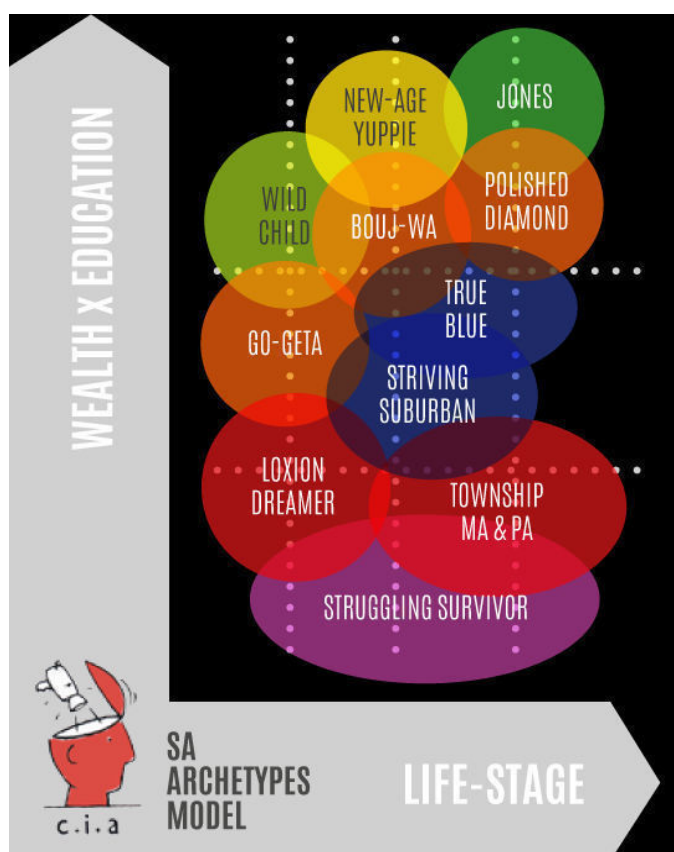
Figure 1 CIA's South African archetypes model (Consumer Insights Agency, 2014)**.**

Loxion Dreamer, Go Geta, Bouj-wa, and Striving suburban were noted as segments which show potential for growth (Figure 1, Loots, 2016; WISE, 2017). The main characteristics of these segments can be seen in Table 2.

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Table 2 Characteristics of some of the CIA Now project consumer segments.

Segment	Loxion Dreamer	Go Geta	Bouj-wa	Striving Suburban
LSM	4-6	7-10	7-10	7-10
Age	18-28	18-24	25-39	35+
Dwelling	Urban	Suburbs & township	Urban	Suburban & Township Middle class
Employment	Part-time employment	Tertiary education	Employed	Employed

The market is also characterised by regional differentiation. South Africa is a fairly large country made up of nine provinces, of which the Western Cape is the most significant wine producing region (Province). However, it is important to note that many of these identified consumers reside in urban centres in the other 8 provinces, therefore wine producers should make a concerted effort and focus on, engaging with, and taking the product to these consumers.

One of the most important overall findings of the WISE initiative was that in order to maintain consumers and attract new consumers, the wine industry will have to work hard at improving their understanding of consumers (Conradie, 2017). Adapting the wine industry from mostly production driven to be more consumer driven, will require in depth investigation and interpretation of consumers' perceptions and preferences.

2. What are consumer perceptions, and preferences

Perception is described as understanding information or the environment, by identifying, organising and interpreting information detected by the senses (Schacter, 2011). Perception primarily involves stimulations of the sensory system which triggers signals in the nervous system (Goldstein, 2009) and is shaped by memory, expectation and learning (Bernstein, 2011). In consumer research, perceptions are the opinions, interpretations, and views, held by consumers that ultimately drive their motivation to purchase a product. Understanding consumers and their needs, and what motivates them, is therefore of the utmost importance and will often determine the success or failure of a product.

Consumer research provides novice and non-expert opinions on products, and gives the most direct indication of preferences and purchasing patterns. Product development (specifically true for wine) was in the past driven by assumptions made by researchers/product developers and what they believed was right for the consumer. In the last 10 years more focus has been placed

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on consumers perceptions and ideas (Lesschaeve, 2007; Schouteten et al., 2015). Consumers acceptance or rejection of a product is not limited to the taste or smell, but also to how the product makes them feel (Meiselman, 2015; Schouteten et al., 2015; Spinelli, Masi, Dinnella, Zoboli, & Monteleone, 2014; Vidal, Giménez, Medina, Boido, & Ares, 2015).

Consumer preference or liking cannot be measured directly, but rather must be inferred from a consumers' response by means of descriptions or numerical data. Figure 2 illustrates the stimulus response model described by Lim (2011). Hedonic measurements of sensory perception are the measurement of a response to a stimuli, and involve two main stages of processing, firstly sensory (five senses) and then cognitive (the brain) (Lim, 2011). The sensory phase includes the stimulus, which could for example be tasting a glass of wine. A sensory signal would then be sent from receptors in the mouth/nose to the brain. The brain receives the signal and interprets it, which is the cognitive process. The brain then processes the signal, draws conclusions about the stimulus, and gives a response. That response could then be: what I taste is wine, it tastes sweet and I like it.
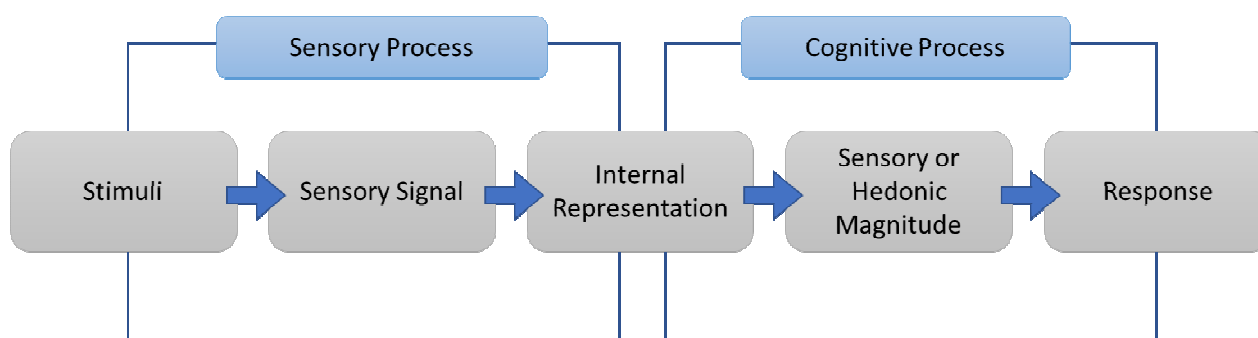
Figure 2 Illustration of the stimulus–response model (Adapted from: Lim, 2011)

Figure 3 illustrates how perceptions of food can be divided into two main groups namely cognitive bias and affective bias (Dubé, Cervellon, & Jingyuan, 2003). Cognitive components include, health consequences and convenience benefits e.g. calories, preparation, storage and availability. Affective components include sensorial aspects like, 'Is it appetising/tasty/palatable?'. Emotional components include feelings, memories and social context. This has also been referred to as the head (cognitive) versus the heart (affective) (Shiv & Fedorikhin, 1999).
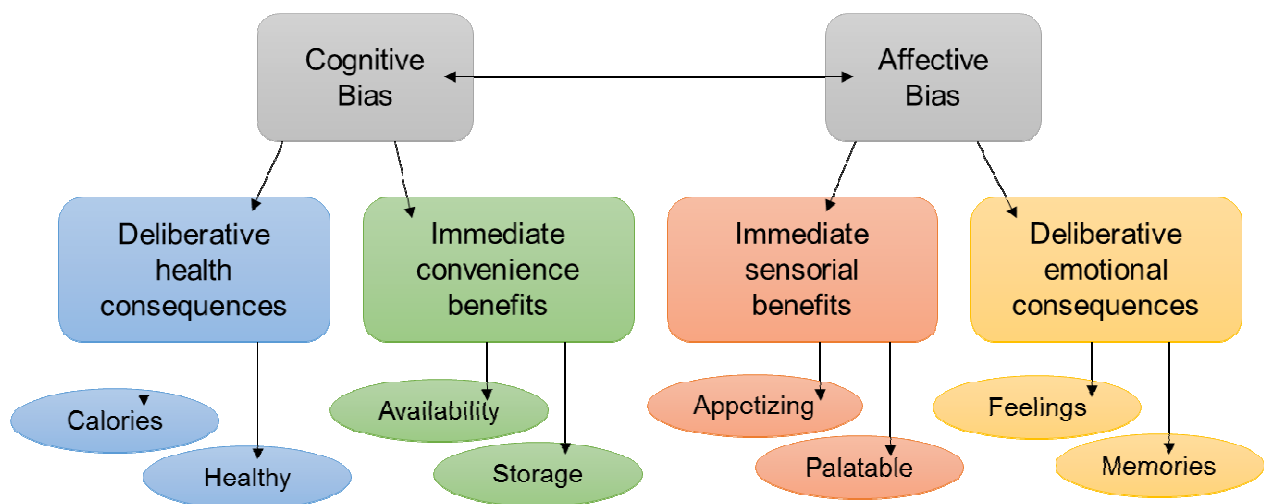
Figure 3 Cognitive and Affective food perceptions (Adapted from: Dubé, Cervellon, & Jingyuan, 2003)

According to Thomson et al. (2010), the best way to understand consumer choice is to investigate "the 'meaning' consumers attach in their minds to the product". This meaning they referred to as conceptualisations, which are defined as conceptual associations i.e. meanings and or feelings ascribed to the extrinsic/intrinsic attributes or consumption experience (Ng et al., 2013a; Thomson & Crocker, 2015, Figure 4).
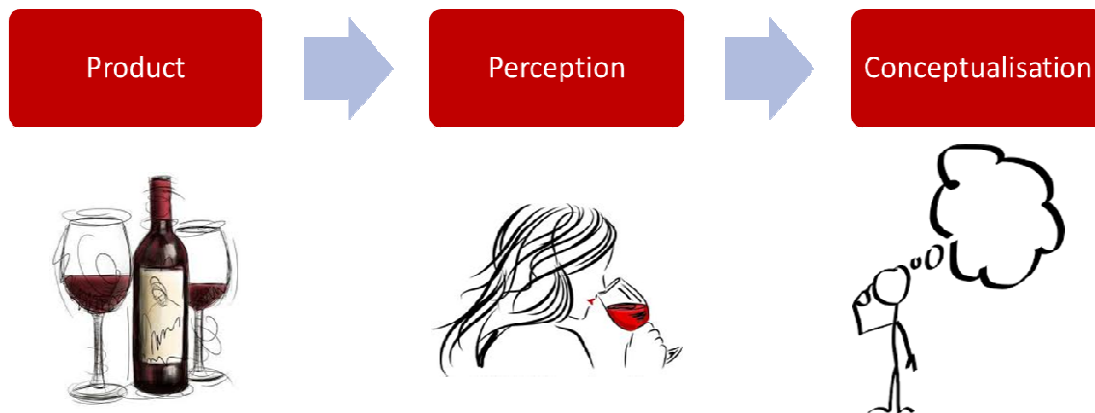
Figure 4 Adaption of Thomson & Crocker's (2015) model linking sensory stimulation to consequent behaviour.

It was proposed by Thomson et al. (2010) that there are two process which occur in the mind during consumption of a product. The first is the identification of the product through the senses, (taste, smell, appearance), and the second is the associations that a consumer makes when thinking of the product. One's overall response to a product is not only dependant on the intrinsic qualities of the product, but also largely on the conceptualisations which one has about the product. These conceptualisations can be functional, emotional, or abstract (P. Silva et al., 2014; D. M. H. Thomson et al., 2010). Emotional conceptualisations are related to how the product makes one feel e.g. 'happy' or 'disappointed'. Functional conceptualisations are related

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to the function of the product e.g. 'will refresh me'; or they can be related to other tangible concepts like 'cheap' or 'expensive'. Abstract conceptualisations are more intangible concepts like 'sophisticated' or 'classic'. It was also noted that it is sometimes difficult to categorise conceptualisation as strictly functional or abstract, but it can also be hypothesised that in most cases the functional/abstract conceptualisations are made prior to consumption, based on the available extrinsic information (Ng, Chaya, & Hort, 2013b).

3. Factors affecting consumer perception

Although consumer perception of a product is based on the actual experience i.e. intrinsic properties of sensory properties taste/smell, research has shown that perceptions are affected by other extrinsic factors (Okamoto & Dan, 2013). These factors range from price and branding, to culture, psychology, and physiology. To gain a better understanding of consumers and their perceptions, the field of consumer science has rapidly expanded to include researchers from different fields including marketing, sensory science, psychology, physiology, and neurobiology. All these fields combine to help understand how a consumer feels/thinks and how they perceive the smell/taste/sound/texture of a product.

3.1 Extrinsic cues
There is the notion that taste of a food/beverage is inherent, and regardless of appearance it will taste good, however this is not strictly true. Research has shown that extrinsic cues in the form of packaging, branding and price do in fact bias taste. Ng et al. (2013b) and their work on blackcurrant drinks showed that sensory properties and product packaging affect liking and consumer conceptualisations differently. Extrinsic properties (brand, label etc) have more of an influence on consumers' abstract or functional conceptualisations than intrinsic (sensory) properties do. The sensory properties on the other hand had more of on an influence on emotions. Liking scores were affected by conceptualisations that consumers inferred from packaging. The authors also suggested that developing a better understanding of the relationship between conceptualisations (emotional, functional, and abstract) and liking will help to better understand consumer behaviour.

Okamoto & Dan (2013), also showed that altering labelling changes how consumers' perceive and evaluate wine. In their study they reduced the sensory quality of wines by increasing their sourness and astringency, and found that the effect was masked when they labelled the wines with country of origin and price. Results showed price had the biggest effect on liking. Okamoto & Dan (2013) concluded that consumer liking is not purely based on taste, and that other factors such as labelling, and price must be taken into consideration.

Navajas et al. (2016) found in their study of wine, that overall quality was based on perceptions of quality and available extrinsic information, not necessarily on the perception of sensory properties (taste, aroma and look of the product). Valentin et al. (2016) found that wines presented in clear glasses received higher quality scores than those presented in black glasses, and balance of taste affected perception of quality.

A products reputation is also an important factor that influences consumers' perceptions. Reputation is built over time and is based on both marketing and consumers' experience with the product (Mercer, 2017).

3.2 Familiarity

Familiarity is described as a consumer's level of experience and previous exposure to a product (Giacalone et al., 2015). The influence of familiarity on preference (Borgogno, Favotto, Corazzin, Cardello, & Piasentier, 2015; Giacalone, Duerlund, Bøegh-Petersen, Bredie, & Frøst, 2014; Laaksonen, Knaapila, Niva, Deegan, & Sandell, 2016), sensory perception (Labbe, Damevin, Vaccher, Morgenegg, & Martin, 2006), risk perception (Fischer & Frewer, 2009), situational appropriateness (Giacalone et al., 2015), and product usage and versatility (Giacalone & Jaeger, 2016) have been investigated.

Consumers are also often reluctant to try products with which they are unfamiliar as they perceive it to be a risk (Giacalone et al., 2015). Therefore familiarity is seen as an important driver, as it reduces uncertainty thereby lowering potential perceived risk. When familiarity increases so do the associations consumers make between the product and ideas or beliefs they have. A correlation between liking and familiarity was found in a study done on liking of berries (Laaksonen, Knaapila, Niva, Deegan, & Sandell, 2016). The berries that were most liked were described as familiar and berries that were least liked were described as unfamiliar.

In a study on beer (Giacalone et al., 2015) increased familiarity was found to increase the number of appropriate usage contexts. The opposite was also found to be true, when beer was unfamiliar consumers struggled to identify appropriate usage contexts. Giacalone & Jaeger (2016) also investigated the influence of familiarity on usage versatility using fruit, wine, and chocolate, and their results confirmed that familiarity is a moderator for appropriateness of use and is positively linked to versatility.

Familiarity is also closely related to product involvement and product knowledge (Zaichkowsky, 1985). These two topics will be discussed in subsequent sections.

3.3 Involvement

Involvement is another important concept in consumer research and it is often used to explain consumer behaviour and segment consumer groups. Verbeke & Vackier (2004) described consumer involvement as "the level of perceived personal importance, interest or relevance evoked by a stimulus or stimuli, which are linked by the consumer to enduring, situation-specific goals" (Verbeke & Vackier, 2004). Three factors affect involvement, firstly the characteristics of the person, secondly the characteristics of the product, and thirdly the consumption environment/situation (Zaichkowsky, 1985). Scales have been developed to measure consumer involvement and will be discussed in section 4.2.1 Familiarity and involvement scales

Differences in the levels of involvement can consequently produce differences in consumer attitudes. Consumers with high levels of involvement will respond differently to product cues than consumers with low involvement. Studies have therefore used level of involvement to segment wine consumers (Bruwer & Buller, 2012; Vannevel, 2015).

3.4 Knowledge

According to Gustafson et al. (2016), knowledge is an important variable to consider in markets for complex, multi-attribute products like wine, and wine knowledge has been shown to affect consumer perceptions (Gustafson et al., 2016; Lu, Rahman, & Geng-Qing Chi, 2016; G. J. Pickering & Hayes, 2017; Taylor, Dodd, & Barber, 2008). Brucks (1985) described three types of product knowledge. First is subjective knowledge, which is knowledge perceived by the person. The more familiar one is with product, the more subjective knowledge one will have. Secondly objective knowledge, which is information stored in the memory. The third type of knowledge is usage experience, which as it indicates is based on purchase and usage experience.

A sensory study that looked at the effect of the term Genetic Modification (GM) on consumers' sensory evaluations of wine (Lu et al., 2016), showed that consumers rated the aroma, taste and appearance of GM wines as less desirable than the non-GM samples. They also segmented consumers and found that, consumers with more knowledge on GM wines gave more objective ratings and, the overall sensory and quality descriptions did not differ significantly.

Faye et al. (2013) looked at the impact of the consumers' knowledge and experience on their perception of wine glasses. Consumer were required to sort a set wine glasses varying in shape. Connoisseurs managed to group the glasses into six groups based on technical properties, however there was less consensus amongst non-connoisseur consumers, who

grouped the glasses mostly on shape. They concluded that knowledge, involvement and experience impact on consumers' descriptions and their ability to sort the glasses.

3.5 Context

Context is a set of circumstances (social and physical) that surround a particular event. Context in terms of food and beverages is the, where, when, who and how of consumption and includes several things ranging from venue, weather, occasion, to company, and ambience (Jaeger & Porcherot, 2017). Studies have shown that context helps explain consumer choice

A study on wine acceptability in different contexts looked at preferences for different wines in different environments. Hersleth et al. (2003) used four contexts, a laboratory, and a reception room, both with and without food. Their results showed that consumers had different preferences in the different environments.

Situational appropriateness is another topic which has been researched. Consumers judge whether the usage of a certain product is appropriate or not in given contexts (Cardello & Schutz, 1996). It is known in food and beverage that consumers' choices are affected by whether they deem the product appropriate for the situation or not (Giacalone & Jaeger, 2016; Meiselman, 2008). Food and beverage consumer research has shown that preference and choice are influenced by contextual factors including social factors, environmental factors, and accompanying meal items. Giacalone et al. (2015) investigated the relationship between familiarity and situational appropriateness of beer, and found that familiarity correlated with usage versatility, and significantly affected how appropriate certain situations were deemed for beer consumption.

3.6 Culture

Culture is defined as the ideas, values, norms, beliefs and social behaviour of a particular group of people and has been found to strongly influence consumer behaviour (de Mooji, 2004). Investigating the differences in perceptions and preferences between different cultures has become increasingly popular. In most of these studies, culture is equated with country, few focus on cultural differences within a country.

Cross-cultural studies have been done on various products and concepts including beer (Aquilani, Laureti, Poponi, & Secondi, 2015; Gómez-Corona, Lelievre-Desmas, Escalona Buendía, Chollet, & Valentin, 2016; A. P. Silva et al., 2016), willingness to consume insects (Tan et al., 2015), quality of steak (Grunert, 1997), acceptance of meat processing (de Barcellos et al., 2010), preference for soy yoghurts (Tu, Valentin, Husson, & Dacremont, 2010), and rice

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cooking techniques (Son et al., 2013) to name only a few. Cross-cultural studies specifically looking at wine include preferences for rosé wine (Velikova et al., 2014), generation Y's perceptions of sparkling wine (Charters et al., 2011), health benefits of wine (Yoo, Saliba, MacDonald, Prenzler, & Ryan, 2013), social representations of wine and culture (Mouret, Lo Monaco, Urdapilleta, & Parr, 2013), and intrinsic quality of red wine (M.-P. Sáenz-Navajas, Ballester, Pêcher, Peyron, & Valentin, 2013).

Recently, with the increased popularity of wine in Eastern countries, there has been a focus on comparing Western and Eastern consumers' wine perceptions and preferences (Lockshin, Corsi, Cohen, Lee, & Williamson, 2016; Yoo, Saliba, MacDonald, Prenzler, & Ryan, 2013).

3.7 Physiology

Another factor affecting consumer perceptions is physiology or human biology. Consumer preferences for food and beverages are influenced by taste and flavour, and therefore differing perceptions of taste (also known as chemosensory perception) account for their different preferences. There are five basic tastes, sweet, sour, bitter, salty and umami (savoury). Then there are mouthfeel/in mouth sensations which include astringency (dry/ puckering sensation) and body. However, due to genetic variation, not everyone is born with the same tasting capabilities, and one's biological make-up affects how one experiences taste and smell (Gary J. Pickering, Jain, & Bezawada, 2013). For example, there are a group of genes which control bitter taste perception, and some variations of these genes limit one's ability to detect bitter compounds (Kim & Drayna, 2004).

Research has investigated the effect of biological factors in wine preference and consumer segmentation. Pickering and Hayes (2012) investigated the relationships between food and beverage adventurousness and taste phenotype, but found that phenotype did not explain willingness to try new stimuli. Pickering and Hayes (2017) found that age was a significant source of variation in liking scores for wine. They suggested that this was possibly a result of older consumers having greater wine experience due to having greater time and opportunity to try a wider range of wines therefore having more clearly defined preferences. Their results also showed that younger consumers showed a clear preference for sweeter wines, when compared to the older consumers who preferred drier styles.

Pickering and Hayes (2017) also noted that differences in chemosensory perception (taste and smell perception) and how it affects liking/preference and consumption of wine are still largely unexplored in the literature.

3.8 Personality

Another factor which may influence liking or intent to purchase is personality. Researchers have investigated the influence of personality traits when it comes to making dietary decisions (Saliba, Wragg, & Richardson, 2009). An example of this is ones willingness to try new foods/beverages often referred to as 'adventurousness' (Hayes & Pickering, 2012). When it comes to consumers and wine decision-making, there is a higher level of perceived risk than for other beverages due to its social status, variability, and complexity of the product category (Lockshin & Corsi, 2012). Therefore consumers may attach more importance to being adventurous when it comes to preference and purchasing (Hayes & Pickering, 2012).

Impulsiveness is a trait know to affect food choice. Saliba et al. (2009) investigated the relationship between the preference for sweet taste in wine and impulsiveness. They found that consumers who showed a preference for sweet tastes in their white wine were also associated with a higher level of impulsiveness and inclined to be less open.

3.9 Factor Web

Factors affecting consumption are often looked at as individual entities, but are actually a complex interconnected web of dependant variables (Figure 5). A change in one factor will affect one or more of the other factors. Take the factor of personality, as an example (Figure 5). Culture and cultural beliefs will influence one's personality. One's personality will determine one's interest and willingness to acquire knowledge, which in turn affects one's familiarity and involvement with a product. Level of involvement then also determines how one interprets extrinsic and intrinsic factors, and the appropriateness of context for consumption.
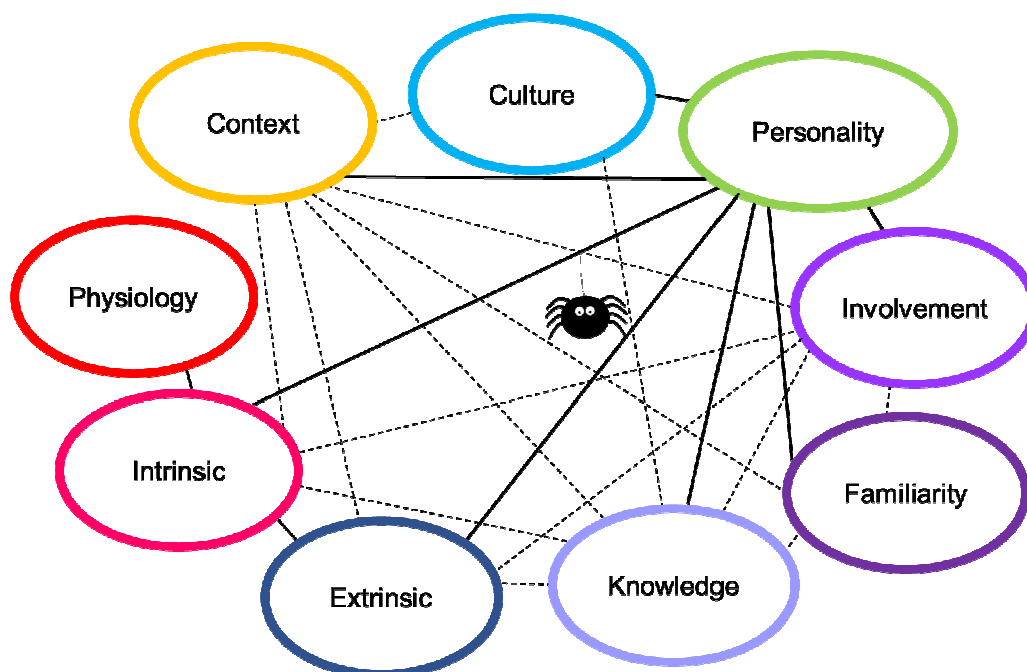
Figure 5 Web of factors affecting consumption.

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These factors are diverse and encompass many disciplines from marketing to psychology and neuroscience. Understandably researchers investigate the factors that are most closely related to their fields of expertise. However, it is becoming increasing obvious that in order to better understand consumer perceptions researchers will need to look at the combination of these factors, and this will require interdisciplinary co-operation and collaboration.

4. Measuring consumer perceptions and motivations

Measuring perceptions and motivations, and encompassing the diverse set of factors affecting them is challenging. It requires the use of both qualitative and quantitative consumer research methodology (Barrios & Costell, 2004), and sensory analysis. Recently there has also been a focus on emotional profiling of products, and the use of neuroscience and virtual reality.

4.1 Qualitative methodology

Qualitative research is frequently used for exploratory research. Qualitative methods are often used when researchers wish to understand "complex issues that may not be immediately implicit in surface responses" (Goulding, 2005; Liu & Murphy, 2007). Qualitative research is a good approach for understanding consumers way of thinking, and for getting their perspective on complex concepts like consumption.

4.1.1 Focus groups

Focus groups are a qualitative method widely used in consumer research (Brug, Debie, van Assema, & Weijts, 1995; Charters et al., 2011; Grunert, 1997; Tan et al., 2015). They typically consist of between 8 and 10 participants, specifically recruited to fit a certain target group (Baxter et al., 2015). The group is led in a discussion by a moderator who usually follows a set of pre-determined questions. Focus groups provide a non-threatening environment for consumers to voice their opinions on a concept or product (Carey, 2015). The act of posing questions to a group, promotes discussion amongst respondents and can in some cases be more fruitful than individual interviews. Focus group discussions also aid in highlighting challenges, and problems as well as identifying likes and dislikes.

An advantage of focus groups is they provide detailed feedback in a relatively short period (Baxter et al., 2015). However, with focus groups you do have a limited sample size, and to get credible results you require a skilled and experienced moderator.

4.1.2 Individual in-depth interviews

Another qualitative methodology is individual (in-depth) interviews. This is a one on one setting, where the interviewer asks the participant a list of questions (usually open-ended) and the interviewer has the opportunity to probe the answers. In-depth interviews are however time consuming, expensive and involve a limited number of responses. The advantage is that answers can be probed, and the subject is not influenced by others. This method is suitable when research is of a sensitive or personal nature, as respondents feel more free to give their opinion in a one-on-one interview rather than during a group discussion (Lawless & Heymann, 2010).

4.2 Quantitative methods

Quantitative research involves large volumes of responses, and any questionnaires used are usually relatively short and contain majority closed ended, yes/no, or Check-All-That-Apply (CATA) type questions.

4.2.1 Familiarity and involvement scales

Consumers' familiarity with a specific product is usually scored on a five point scale: where 1 = I do not recognize the product; 2 = I recognize the product, but I have not tried it; 3 = I have tried it, but I do not consume the product; 4 = I occasionally consume the product; 5 = I regularly consume the product (Bäckström, Pirttilä-Backman, & Tuorila, 2004; Borgogno, Favotto, Corazzin, Cardello, & Piasentier, 2015).

Involvement scales usually use questions belonging to 5 main categories: product importance, hedonic value, symbolic value, risk importance, and risk probability, and the questions are answered using a Likert scale. Figure 6 is an example of the 10 item Personal Involvement Inventory (PII) scale developed by Zaichkowsky (1994). The author's original scale contained 20 points (Zaichkowsky, 1985) but some items were removed as they were seen as redundant and the scale was reduced to a 10 items. In Figure 6, the items in red on the scale are reverse scored, with the aim or reducing participants boredom. Each item is scored on a 7-point scale, and an average is then calculated. An average score of below 5 is considered low involvement.

Please mark (x) the point that most represents how you feel about _____?

Important							Unimportant
Irrelevant							Relevant
Means a lot to me							Means nothing to me
Worthless							Valuable
Interesting							Boring
Unexciting							Exciting
Appealing							Unappealing
Mundane							Fascinating
Not needed							Needed
Involving							Uninvolving

Figure 6 Zaichkowsky's (1994) 10-point Involvement scale.

Bruwer & Buller (2012) used a 17-item involvement scale to measure Japanese consumers involvement levels with wine. They found involvement to be influenced by age. Involvement increased until 35-45 years of age (which was equivalent to Gen X) and then gradually decreased again. Both frequency and quantity of consumption correlated positively to level of involvement. Consumers with high involvement levels showed a preference for wines from old world regions mostly France and Italy.

4.2.2 Best-worst scaling

Best-worst scaling (maximum difference scaling). Participating consumers are presented with an object (to be investigated) and a list of four to five words, and they are required to decide which of the words, for whatever reason, they most closely associate with their response to the object in question and which word they associate least with their response to the object in question (D. M. H. Thomson et al., 2010). Each participant is presented with 8-20 lists depending on the complexity of the object being researched.

Best worst scaling has been used in both Spain (Bernabéu, 2012) and Portugal (Nunes, Madureira, Oliveira, & Madureira, 2016) to identify the most important attributes/criteria for wine choice. Both studies found previous tasting and region of origin to be the most important attributes. Cohen & Sirieix (2009) also showed its potential for cross-cultural research, when they used it in a cross-cultural study comparing French, Australian and British consumers' wine choice criteria. Best-worst scaling has also been used to investigate emotions linked to chocolate (D. M. H. Thomson, Crocker, & Marketo, 2010).

Most recently Lategan et al. (2017) used best worst scaling to investigate the importance of wine attributes to South African Generation Y consumers. Taste was found to be the most important attribute, and information on the back label the least important attribute. The results were comparable with those of studies done on generation Y consumers in the United States of America.

4.2.3 Motivation

Directly asking consumers about their motivations does not always yield accurate results (Vidal, Ares, & Giménez, 2013). Often consumer do not understand and therefore cannot explain their own behaviour, or they simply do not share their actual feelings out of fear that their opinion may be deemed incorrect (van Kleef, van Trijp, & Luning, 2005). Specific questionnaires have therefore been developed to investigate motivations for consumption. The most well-known is the Food Choice Questionnaire (FCQ) developed by Steptoe et al. (1995). The FCQ was designed to investigate motives for the selection of food. The questionnaire contained 36 items which were rated for importance on a four-point scale. Items belonged to nine different categories, namely: health, mood, convenience, sensory appeal, natural content, price, weight control, familiarity, and ethical concern.

The validity and reliability of the FCQ has been investigated in many countries (Cabral, de Almeida, & Cunha, 2017; Dikmen, Inan-Eroğlu, Göktaş, Barut-Uyar, & Karabulut, 2016; Markovina et al., 2015) and it has been used in many cross cultural studies investigating differences in motivation for food consumption between countries (Eertmans, Victoir, Notelaers, Vansant, & Van den Bergh, 2006; Miloševi, Eželj, Gorton, & Barjolle, 2012; Pieniak, Verbeke, Vanhonacker, Guerrero, & Hersleth, 2009; Prescott, Young, O'Neill, Yau, & Stevens, 2002). The FCQ has also been adapted to investigate motives for example organic versus conventional food consumption (Baudry et al., 2017). They investigated nine factors, including ethics, taste, price, health, and convenience, which were present in the original. The authors added the factors absence of contaminants, avoidance for environmental reasons, innovation, and local & traditional production. They found health, taste, and absence of contaminants to be the most important motivations for organic food consumption.

4.2.4 Preference and Liking

The 9-point hedonic scale is the most commonly used scale of measuring consumer liking of a product. It is a balanced bi-polar scale, four positive terms and four negative terms with a neutral centre point (Lim, 2011). Consumers are often asked to rate their liking of products on various scales. Other scaling methods have also been developed. Preference ranking is another method used to establish which samples are most preferred by consumers. Consumers are usually given a set of samples and are then asked to rank them in order of their preference e.g. from least liked, to most liked.

Hedonic liking/preference data is then often combined with descriptive sensory data (obtained from trained panels), in an analysis known as preference mapping (Greenhoff & MacFie, 1994). This aids in identifying drivers of liking for a specific sample or product, and allows the

identification of potential sub-groups of consumers within differing preferences. Internal and external preference mapping are most commonly used methods and have been used in many studies on wine as listed by Lesschaeve (2011).

4.3 Sensory perception

Sensory analysis is used in several applications, most notably for quality control, and product development and optimisation. However, in the last few years sensory research has been much more focussed on consumers' sensory perceptions. This involved the development of rapid sensory analysis methods used for analysis with consumers. Descriptive sensory analysis (DA) (Lawless & Heymann, 2010) was typically the method of choice for sensory analysis but it requires trained panellists, and is expensive and time consuming. This prompted researchers, to begin looking at alternative methods for sensory analysis which could be completed faster and that could preferably make use of untrained panellists or consumers.

Many alternative sensory methods have been developed including, check-all that-apply (CATA), sorting, napping®/projective mapping, pivot profile and polarised sensory positioning (Varela & Ares, 2014). The methods most commonly used with consumers are sorting (Faye et al., 2013; Lelièvre, Chollet, Abdi, & Valentin, 2008), napping® (Laaksonen, Knaapila, Niva, Deegan, & Sandell, 2016; Louw et al., 2013) and CATA (Bruzzone et al., 2015; Reinbach, Giacalone, Ribeiro, Bredie, & Frøst, 2014). CATA was also modified to RATA (rate-all-that-apply) (Ares et al., 2014). RATA follows the same basic principal as CATA, with the addition of rating each chosen attribute.

CATA has been successfully used with consumers to profile many products and results have been shown to be comparable with those elicited from descriptive analysis (Ares et al., 2015). With CATA, consumers are supplied with a list of terms and are asked to choose the ones that best describe a given sample. An advantage of using CATA is that it is a simple task for consumers to complete and can include descriptive, emotional, and hedonic terminology. The structured format of CATA makes collection and analysis of data from a large group of consumers easier and faster, when compared to sorting and napping®/projective mapping (Varela & Ares, 2014). CATA has also been successfully used with consumers to profile Sauvignon blanc wines (Ares et al., 2015; Lezaeta, Bordeu, Naes, & Varela, 2017).

4.4 Emotional perception

Emotions play an important role in everyday life including in consumption of food and beverages. Emotions elicited by a product often influence whether you will purchase it initially and ultimately whether you will purchase it again. Food evokes many emotions. It is more than

just a form of energy, most people want to feel some sort of pleasure from food (Gmuer, Nuessli Guth, Runte, & Siegrist, 2015). Studying consumers' emotional responses elicited by foods and beverages has become increasingly important over the last few years. (Gutjar et al., 2015; Jaeger, Cardello, & Schutz, 2013; Jaeger, Vidal, Kam, & Ares, 2017; King, Meiselman, & Thomas Carr, 2013; Schouteten et al., 2015; A. P. Silva et al., 2016). This information has the potential to provide insight into differences between products that goes beyond the standard sensory descriptions and liking, and could prove useful for marketing and branding of products i.e. the SensoEmotional optimization of products (D. Thomson, 2006).

Researchers have started to investigate the relationships between sensory descriptions and emotional responses evoked by a product. These studies have been conducted on different products including chocolate (D. M. H. Thomson et al., 2010), black currant squash (Ng, Chaya, & Hort, 2013a) and wine (Ferrarini et al., 2010). Although no wine was tasted during this study (with Italian wine consumers), results showed that wine consumption was mostly associated with emotions linked to pleasure.

There are multiple methods all involving direct measurement of explicit emotions using standardised lexicons. Since 2010 several lexicons have been developed in various languages to verbally access experienced emotions. The number of terms on the lexicons range from 59 (D. M. H. Thomson & Crocker, 2013) to 16 terms (Ferrarini et al., 2010). The most well-known method linking emotions and food research is the EsSense Profile™ which consists of 39 emotional terms (King & Meiselman, 2009; Ng et al., 2013a). Most recently, Schouteten et al. (2015) decided to combine sensory profiling and emotional profiling of products and developed the EmoSensory® wheel. This wheel uses the rapid sensory methodology RATA in a wheel format questionnaire, and can be seen in Figure 7.
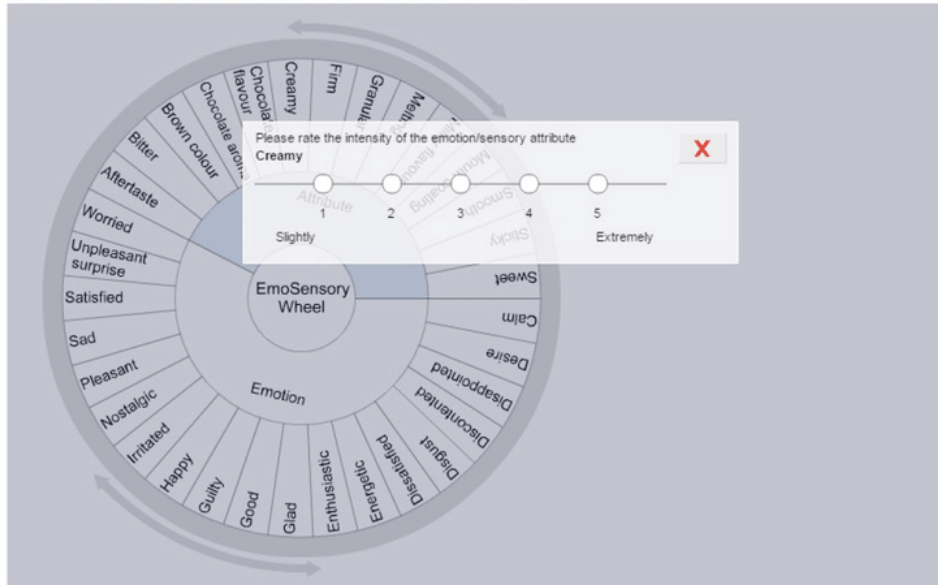
Figure 7 EmoSensory® wheel (Schouteten et al., 2015).

Emoji have also been investigated as a tool for emotional profiling of food (Jaeger, Vidal, et al., 2017; Vidal, Ares, & Jaeger, 2016). Consumers are familiar with emoji and use them as a form of non-verbal communication to express emotions on social media and via text messages. They are a reasonably universal language and could help bridge language gaps for studies done with consumers who speak different languages. Jaeger et al. (2017) did a cross-cultural study between USA and Chinese consumers which looked at using emoji to measure emotional associations with food names. Their results showed that consumers could discriminate between the food names using emoji. They found of particular interest, the emoji with heart shaped eyes, which performed well and distinguished between stimuli that were loved and stimuli that evoked just generally positive feelings of pleasure and happiness. There were limitations to this method including the difficulty in making sure that the emoji are interpreted in the same way by all consumers.

In a subsequent study, researchers used emojis to investigate product-emotional associations on a variety of foods and beverages (Jaeger, Lee, et al., 2017). It was also a cross-cultural study between Korea and New Zealand, which made use of a CATA list made up of 33 emoji. Results showed that products with high liking scores were associated with positive emoji, and the opposite was also true, products with low liking scores were associated with negative emojis. Consumers found the task of completing the emoji survey easy. However, when the emoji results where compared to those obtained from a word-based questionnaire, it was found

that the words were more discriminative than the emoji. The authors stressed that emoji should be seen as an alternative method to word-based emotion surveys, but not a substitute.

Another study looked at 5 method variants of the emoji questionnaire investigating emotional associations with different seafood names (Ares & Jaeger, 2017). Their research found that the wording of the question did not affect the results, forcing a yes/no answer gave higher frequencies of citation of emojis, and adding RATA to the CATA gave better discrimination between products.

4.5 Virtual reality

Immersive virtual reality (VR) is a relatively new technique being used in consumer research. VR allows consumers to be immersed into a virtual world, via simulation. Studies have used VR to investigate consumer purchase behaviour in simulated stores (Bressoud, 2013; Van Herpen, Van Den Broek, Van Trijp, & Yu, 2016) . Leatherhead Food © make use of VR in market research and have used it to evaluate situational appropriateness of beverages and packaging (Patra, 2017). A recent study by Ung et al. (2017) compared consumer portion sizes when using a fake buffet (food replicas) and a virtual reality buffet. There was a good correlation between the portion sizes chosen under both conditions, and they concluded that VR shows promise as a method for consumer research (Ung et al., 2017).

The advantages of using VR is that it boosts qualitative research by promoting high levels of engagement with the product, increases external validity of laboratory experiments, easily manipulated environments, and provides detailed insights (Patra, 2017; Ung et al., 2017; Van Herpen et al., 2016). However, VR methods in sensory and consumer research are still in the early stages of development (Jaeger & Porcherot, 2017) and research is limited due to the high cost of the equipment.

4.6 Neuroscience

In the last ten years the use of neuroscience to help understand consumer behaviour has become increasing popular. The medical technology of functional magnetic resonance imaging (FMRI) and electroencephalography is used to examine the brains response to stimuli (Hsu & Yoon, 2015). Neuroimaging technology enables researchers to probe brain activity at a neural level (Aydinoglu & Sayin, 2016).

Plassmann et al.(2008) did a study on wine, where consumers tasted wines marked with a range of prices. The participants were told that they would taste 5 different priced wines, however there were duplicates of wines marked with a high and low price. The participants

brains were scanned using FMRI while they tasted the samples. The results showed that consumers both indicated that they liked the more expensive wine and the neuroimaging showed that they physically enjoyed it more.

The use of neuroimaging is however polarising. Some researchers feel that it shows promise (Berčík, Horská, Gálová, & Margianti, 2016; Hsu & Yoon, 2015), others are sceptical of its capacity to provide useful insights (Solnais, Andreu-Perez, Sanchez-Fernandez, & Andreu-Abela, 2013) and wary of ethical boundaries being crossed (Murphy, Illes, & Reiner, 2008). Piqueras-Fiszman & Spence (2015) suggest that neuroscience techniques should be used to complement existing consumer research methods rather than replace them. Neuroimaging is very cost-intensive (Aydinoglu & Sayin, 2016) and is therefore used more often in industry than academics.

5. South African wine consumer research

There has been very little published research that has dealt specifically with South African wine consumers. A few studies have looked at generation Y consumers. South Africa was included in the cross-cultural study comparing the views on sparkling wine of Generation Y consumers from different countries (Charters et al., 2011), and as previously mentioned Lategan et al. (2017) investigated the importance of wine attributes to generation Y consumers.

The most work has been done on consumer segmentation. Ndanga et al. (2009) looked at identifying key market segments in South Africa, focussing on 'Black Diamonds', the fast growing black middle-class. The consumer insight agency (CIA) and The Moss group (as part of the WISE initiative) identified segments of the South African population which should be targeted to grow wine consumption (Consumer Insights Agency, 2014; The Moss Group, 2015).

Some of this research is almost 10 years old and yet when looking at the latest available statistics on South Africa's wine consumption per capita for 1999 to 2015 there has been no significant increase in consumption (Figure 8). Sparkling and Fortified wine consumption has remained static. The natural wine category overall has seen a decrease since 1999, with only a slight increase in the years 2013 -2015, however still not equalling the consumption figures of 1999.
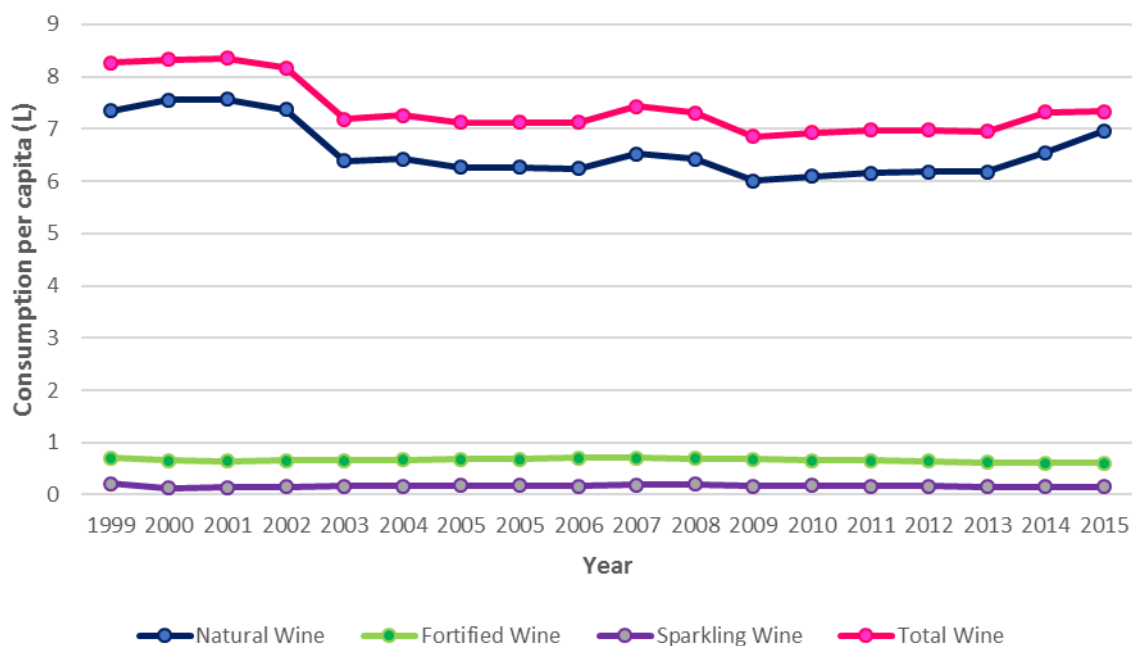
Figure 8 South Africa's wine consumption per capita for the year 1999 to 2015 (SAWIS, 2016).

6. Concluding remarks

Understanding consumers' perceptions and motivations for consumption for any product is a challenge. Wine is a complex product category, and there are multiple elements that affect consumers perceptions, from marketing and packaging, sensory perception (taste/smell), knowledge and familiarity, physiology, psychology, to cultural beliefs.

As previously discussed there are many options in term of research methodology and ways of measuring consumers' perceptions, and the choice of method (or combination of methods) will depend greatly on the specific aim of the research and which factor you wish to investigate. Each method has its advantages and limitations. Combining qualitative, quantitative, and sensory methodology is a good way to get the full picture. Using qualitative research i.e. focus groups or interviews allows one to go in depth and get detailed answers from a small group of target consumers. Detailed answers are generated which can be used to identify and build themes which can be probed on a larger scale using quantitative and sensory research methods. Qualitative research ultimately helps you to understand what questions should be asked in follow up quantitative and/or sensory research phases. Questionnaires can then be developed, or existing ones can be adapted to investigate the emergent themes and the appropriate sensory analysis methodology can be chosen.

Ultimately combining several methods will generate insights into South Africa wine consumers from different angles.

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Chapter 3

Exploratory study of urban South African consumers' perceptions of wine and wine consumption: focus on social, emotional, and functional factors

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Abstract

Wine is an important part of South Africa's heritage, and the industry is of economic and cultural importance. Historically, some population groups had more access and greater cultural affinity for the product wine, but such historical patterns are rapidly changing, particularly in urban areas. The objective of this study, therefore, was to obtain a better understanding of current South African (SA) wine consumers and their perception of wine. Consumers were recruited to participate in focus groups, with the aim of investigating influences on wine perceptions and consumption patterns. The groups were split according to ethnicity and gender, and all groups were questioned following the same discussion guide. Questions focused on when and how wine is consumed, the perceptions of wine in general, the wine style preferences and factors that are considered barriers to greater wine enjoyment. The data for this consumer group suggested limited differences between ethnic groups, while differences according to gender appeared more notable. Other factors affecting wine consumption were life-stage, context of consumption and social and emotional connotations. The data analyses shed new light on the rapidly evolving wine consumer landscape in a culturally diverse but cosmopolitan South African environment.

1. Introduction

Globally consumer behaviour, attitudes, perceptions, and motivations are popular themes in recent and current consumer research. Studies cover a wide range of topics and include consumers' acceptance of beef processing techniques (de Barcellos et al., 2010), differences in craft and industrial beer consumption (Gómez-Corona, Escalona-Buendía, García, Chollet, & Valentin, 2015), and exploring consumers' acceptance of insect based foods (Tan et al., 2015).

When it comes to food or beverage choice, there is more to it than purely sensory appeal. What one consumes can be strongly influenced by the mind (Gutjar et al., 2015). This occurs in two ways; firstly, identifying a product by how the senses perceive it, and secondly the associations or connotations that are evoked when thinking of that product. Consumers' responses to food or beverage products are not solely based on the product's intrinsic and extrinsic properties, but are also strongly influenced by their personal conceptualisations. Conceptualisations can be defined as associations that consumers have between concepts and a product (Thomson,

Crocker, & Marketo, 2010). Following this definition, an example of conceptualisations for cake could be 'birthday', 'dessert', or 'chocolate'. Some conceptualisations are developed based on personal experience, and others are learned from external sources such as media and marketing practices. Conceptualisations can be functional, emotional or abstract connotations connected to the consumption or use of a product (Ng, Chaya, & Hort, 2013; Silva et al., 2016; Thomson et al., 2010), and can be affected by one's cultural beliefs. In general alcohol consumption has been found to occur for several reasons: social obligations, the psychological effects it can have and simply for pleasure (Crawford, 1987). It is important to investigate consumer conceptualisations of wine as it will allow us to understand how consumers experience it, and how that experience potentially differs amongst different consumer groups.

With the increase in globalisation, cross-cultural studies have become widespread in consumer research. Culture has even been suggested to be one of the most powerful determinants of attitudes and behaviours towards food (Cervellon & Dubé, 2005). Many studies have investigated its influence, including studies on likes and dislikes of food (Cervellon & Dubé, 2005), social representations of wine as a function of wine expertise and culture (Mouret, Lo Monaco, Urdapilleta, & Parr, 2013), motives for food choice (Prescott, Young, O'Neill, Yau, & Stevens, 2002), description and preference of soy yoghurts (Tu, Valentin, Husson, & Dacremont, 2010), conceptualisations of beer (Silva et al., 2016) and consumers' attitudes towards rice cooking (Son et al., 2013), to name only a few.

One common feature between several previous cross-cultural studies is the focus on the comparison of consumers from different countries with differing food habits, geographical and historical environments, thus equating culture and country. However, the Cambridge dictionary defines culture as "the way of life, ideas, general customs, beliefs, and social behaviour of a particular group of people" (Cambridge University Press, 2011). It could then be argued that different ethnic groups (or even to some extent gender groups) within one country, could be considered to have different cultures and more specifically for this study drinking cultures that potentially differ.

South Africa is often termed "the rainbow nation" due to the multicultural nature of the country, the variety of ethnic backgrounds, languages, and religions (Brand South Africa, 2017). This is mostly due to the combination of original inhabitants the Khoisan (Bushmen) and African groups, and immigrants from Britain, Europe (Dutch and French) and later the East (Indian and Chinese). Although South Africa is one of the oldest new world wine producing countries, the wine industry suffered due to political turmoil and sanctions under the rule of the Apartheid government (Fridjhon, 2013). During this period, under the Apartheid laws, ethnic groups classified as non-white, had limited access to alcoholic beverages resulting in the wine market

being white dominated. It has however undergone a shift in ethnic profile since the first democratic elections 23 years ago. This change makes wine an interesting subject to investigate across different ethnic groups within South Africa. Minimal research has been done on comparatively new black wine consumers, and their relatively short wine consumption history.

According to the latest available statistics, the South African population composition is 79.2 % Black, 8,9% White, 8.9% Coloured and 2.5% Indian/Asian (Statistics South Africa, 2015). Gauteng contains almost 25% of the entire South African population as well as the largest percentage of wine consumers (South African Audience Research Foundation, 2014). The Gauteng population composition as per Statistics South Africa is 74% Black, 19% White, 3% Coloured, and 2% Indian/Asian (Statistics South Africa, 2015). Therefore, in an effort to gain insight into the perceptions of current wine consumers, including the emerging and growing black South African consumer group, this research focused on the Gauteng province of South Africa, specifically the urban areas of Johannesburg.

Producers can control the sensory quality of the product 'wine' and how it looks and feels to the consumer (Vabø & Hansen, 2014), but the question remains – how does the consumer perceive or conceptualise these properties? This study aimed to investigate differences in wine perception across ethnic groups, as well as, what influences wine consumption, how consumers drink and use wine, and how occasion influences wine or alcohol choice. The study used a qualitative approach making use of focus groups.

2. Materials and methods

2.1 Methodology

Focus groups were used for data collection in this study. Focus groups are a qualitative method which has been successfully used to investigate consumer perceptions of foods and beverages (Tan et al., 2015). Focus groups usually consist of between 6 to 10 participants, who have been randomly selected from the target group and involve the participants being brought together for a discussion of a series of questions to obtain their opinion (Barrios & Costell, 2004). Six focus groups (a total of 44 consumers) were conducted to investigate South African consumers' perceptions of wine.

2.2 Participants

The composition of the focus groups was decided upon after investigating consumption statistics, as well as consulting with market research experts and members of industry. Living Standards Measure (LSM) is a tool used in Southern Africa to categorise the population into 10

groups based on living standards criteria such as the degree of urbanisation, and ownership of cars and major appliances (SAARF, 2016). LSM 7-10 are the largest income categories, and were therefore, the focus of this study given that wine is considered a luxury item and one requires disposable income to purchase it. Table 1 shows the percentage of each age group and the total proportion of male and females for wine consumers belonging to LSM groups 7-10. The available wine consumer statistics (Amps, 2014) show that the two largest wine consuming ethnic groups in South Africa are the Black African and White/Caucasian groups, 81.3 % and 63.7% respectively of these two wine consuming populations reside in Gauteng.

Table 1 Wine consumers belonging to Living Standards Measure group 7-10 (Amps, 2014).

Demographics	% of wine consumers
Age	
18-19	3.20
20-30	30.36
31-45	6.74
46-49	29.11
50+	30.60
Gender	
Female	56.34
Male	43.66

Participants belonged to LSM groups 7-10, were regular wine consumers (consuming wine at least once a week), resided in urban areas of Gauteng, worked full time, and held a tertiary qualification. More specifically participants had to have personally purchased wine for their own consumption, spent a minimum of R50 per bottle, and bought at least two 750ml bottles in the past month. The study focused on established wine consumers from a professional (working) background, with low to moderate wine involvement, ranging in age from age from 26 to 55. On average the male participants were older than the females. There were four black groups and two white groups, as the black population is the least investigated and seen as the new emerging wine market. Groups were also split by gender, which was seen as a supplementary objective, based on previous research on alcoholic beverages one can expect to find differences (Do, Patris, & Valentin, 2009; Gómez-Corona et al., 2015). The group composition can be seen in Table 2.

Table 2 Summary of focus group demographics.

Group	No. of participants	Gender	Ethnicity
1	7	Male	Black African
2	9	Male	Black African
3	7	Male	White/Caucasian
4	6	Female	Black African
5	7	Female	Black African
6	8	Female	White/Caucasian

2.3 Procedure

Participants attended one session, lasting approximately 2 hours, with a 15-minute break after the first hour, during which refreshments were provided. The smallest group consisted of 6 participants, and the largest group consisted of 9 participants. The sessions were audio recorded. A professional research moderator led the interviews, and the author and assistant moderator observed the group behind one-way glass and were in constant contact with the moderator. All focus group discussions took place in the early evening. Participants were also asked to bring a bottle of wine which served as a pre-focus group task which promoted engagement with wine before the session. It also served as a practical discussion topic to facilitate discussion on wine labels, purchasing, and personal preferences. The abovementioned was not influenced by the researcher.

2.4 Structure of the focus group interview

Focus groups followed a semi-structured interview protocol. The moderator used a predefined discussion guide, which was developed around eight main topics which can be seen in Table 3.

Table 3 Topics covered in the questionnaire used to guide the discussion of the focus groups

Themes

1. Broad alcohol exploration: Types of alcohol consumed and occasions.
2. Context of consumption/ Occasions where wine is consumed
3. Wine purchasing
4. Cultural and personal references – where/ when did your wine consumption start, barriers and influencers
5. Wine knowledge: practical, functional, or technical
6. Wine flavours, cultivars, and brands
7. Wine consumer consumption trends
8. Show and tell of own wines

2.5 Data analysis

After each focus group was concluded, the moderator and researcher discussed first impressions, and these were summarised. The recordings from the focus groups were then transcribed into Word documents, and the moderator's words were removed from the text. The transcripts were then cleaned by removing irrelevant words, after which thematic content analysis (Neuninger, Mather, & Duncan, 2017; Neves, Teixeira, & Ferreira, 2015) was done by three researchers. Thematic analysis is "a method for identifying, analysing, and reporting patterns within quantitative data" (Braun & Clarke, 2006). The authors then met with the moderator after having individually analysed the transcripts. The main themes were identified and agreed upon, and are discussed in the results section.

Thematic analysis is "a method for identifying, analysing and reporting patterns (themes) within data" (Braun and Clarke, 2006, p. 79). In such cases, a theme "captures something important about the data in relation to the research question, and represents some level of patterned response or meaning within the data set" (Braun and Clarke, 2006, p. 82). Thematic analysis was accomplished by going through five stages: familiarizing with the data, generating initial codes, searching for themes, reviewing themes, and defining and naming themes (Braun and Clarke, 2006, p. 87).

3. Results and discussion

During the focus group discussions, a range of topics were covered, and frequently mentioned ideas were grouped into eleven main themes (Table 4) which were further discussed in this chapter. Six themes were classified as social and emotional factors and included: gender, ethnicity, journey & role of life-stage, context of consumption, conceptualisations, and barriers. Three of the themes were classified as extrinsic factors namely: price & purchasing, bottle closures and health. The two themes, sensory perception, and cultivars were identified and classified as intrinsic factors.

Table 4 The main themes that emerged during the focus groups.

Social/ Emotional factors	Extrinsic factors	Intrinsic factors
Gender	Price & purchasing	Sensory perception
Ethnic group	Bottle closures	Cultivars
Journey & role of life-stage	Health	
Context of consumption		
Conceptualisations		

Barriers

This study did not reflect a large distinction between ethnic groups. Gender is the biggest dividing factor and seems to outweigh other variables when it comes to differences in wine consumption. The different ethnic groups in South Africa have similar beliefs regarding gender roles, which are based on the premise that women are less deserving of power and less important than men (Commission for Gender Equality, 2014).These similar beliefs may explain the limited differences between the ethnic groups and larger differences between genders.

Historically males (worldwide) used to consume far more alcohol than females. However, studies have found that females now drink as much alcohol as males, and this is most evident in the millennial generation (Alati et al., 2014; Slade et al., 2016). There are a few reasons for this, firstly prices of alcohol have decreased, and the availability of alcohol has increased, it is now freely available at most convenience stores. Secondly, females enjoy more freedom and are now able to join the professional working world, and consequently have picked up the culture of after work drinks with colleagues. In South Africa 56% of the wine consuming population is female, and they seem to consume more wine on a broader set of occasions than their male counterparts who make up only 43% of wine consuming population (South African Audience Research Foundation, 2014). Where most men start off consuming beer, women are choosing to start with wine. In the modern context, women (both black and white) have chosen wine as their alcohol of choice, to demonstrate confidence, femininity, sophistication, and social standing. The differences between males and females and the cultural groups are discussed further, where relevant, in each of the following subsections.

3.1 Journey and role of life-stage

It was found that females from both cultural groups tended to start consuming wine on a more regular basis earlier in their life than their male counterparts. Younger males of both cultural groups drink mostly beer and spirits (whiskey), especially in South Africa which has a beer drinking culture. This is not surprising as Africa has a long history of beer production and consumption, from the traditional home-brewed sorghum and maize beers to the commercial hops and barley versions. In African cultures women were typically responsible for brewing the beer, and men consumed it (Willcox, 2017). This is possibly another reason female wine consumption is higher, as men are still consuming beer, but females have distanced themselves from beer and adopted wine as their beverage of choice.

Overall there was agreement amongst participants that life stage has a big influence on wine consumption, and with age reasons for alcohol consumption and alcohol choices may change. As Bruwer et al. (2012) also noted, wine consumption seems to positively correlate with

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increasing age. For both genders and ethnic groups, five stages of the wine consumer's journey were identified (Figure 1). Those stages are: early exposure, first introductions, experimentation & re-discovery, growing sophistication & maturity, and becoming a collector. Each stage will be discussed separately.
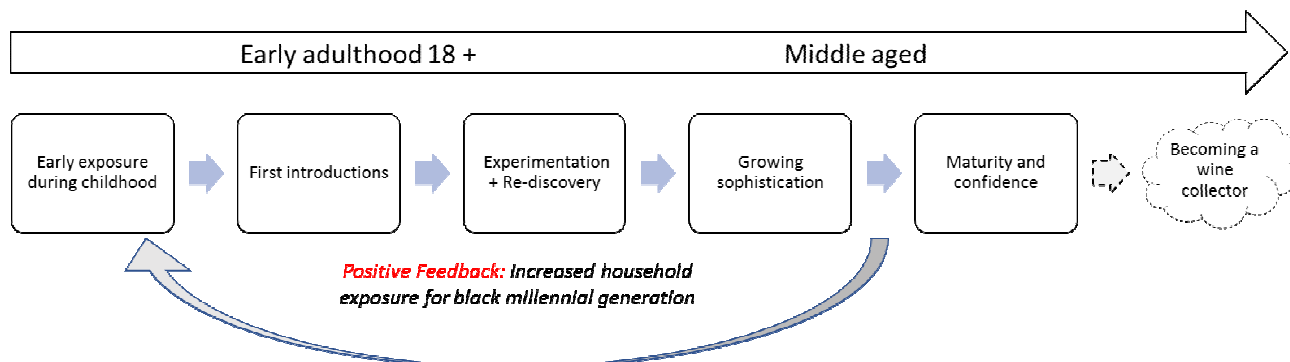
Figure 1 Wine consumer journey

3.1.1 Stage 1 - Childhood exposure

Generally, the largest difference between ethnic groups occurred at the childhood exposure stage. The majority of the white participants recalled memories of parents and other family members consuming wine on a regular basis, particularly around the dinner table. As was to be expected, for the majority of the black participants there was limited exposure to wine at home during their childhoods. Few recalled seeing wine around the house or on the dinner table. Wine was occasionally consumed on special occasions and there was 'no real sense of wine appreciation'. One black female participant mentioned how she '*did not know what wine was all about*' and that in her youth she saw it as just '*another form of alcohol*'.

Interestingly, abstaining from alcohol and wine consumption were both linked to religion. One participant mentioned how she never saw alcohol at all during her childhood, as her parents did not drink for religious reasons. Contrastingly others, both black, white, male and female, said in their childhood they associated wine with church. Some males (both black and white) making specific mention of access to '*stolen sips*' of communion wine as altar boys.

Wine consumption can therefore to some extent be linked with childhood experiences, but early exposure and the choice to drink wine as an adult, are not necessarily correlated.

3.1.2 Stage 2 - First Introductions

As has been previously identified, most consumers said they first tasted wine in their teenage years when it was either a '*stolen sip of communion w*ine' or a '*taste of parent's wine at the dinner table*'. Participants agreed that they did not enjoy their first experience with wine and admitted that drinking wine was an acquired taste which they developed over time. This notion

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is not uncommon, studies have shown that wine (and alcohol in general) can have bitter tastes and unfamiliar aromas, which when tasted by children are typically disliked (Lesschaeve, 2011). Over time, through repeat exposure, liking of these harsh or unpalatable flavours develops (Melo, Delahunty, & Cox, 2011).

There was mention of mixing red wine with cola drinks to make it more palatable. Most of the males admitted they were drinking more for the alcohol content than taste, and they drank inexpensive sweet wine due to affordability and ease of access.

3.1.3 Stage 3 - Experimentation & re-discovery

Experimentation with wine coincided with the freedom of leaving home as participants only began drinking wine in their twenties once they started working; '*after university when I got my first job, that was when I really started drinking wine*'. This phase begins from legal drinking age and extends into mid-twenties (Charters et al., 2011). It is during this life stage where consumers are socialised to wine. They start to acquire the taste and gain knowledge about wine and the possible choices available. This stage of trying new things helps drive the shaping of consumer wine sensory preferences (Lesschaeve, 2011; Melo et al., 2011).

It is at this stage that consumers realise that wine is different from other alcoholic beverages. Beverage choice is influenced by one's desire to convey a specific impression, and wine is a social beverage that has connotations of sophistication, wealth, and romance (Kim & (Shawn) Jang, 2014). It appears this is the stage where new consumers are potentially won or lost.

3.1.4 Influences and Catalysts along the journey

The key wine journey benchmark is at the moment of a consumers' re-introduction to wine by a wine 'mentor' in their lives, taking them on a new exploration of the heritage of wine culture. The re-introduction and exploration of wine remains firmly linked with social moments and wine 'mentors' (Olsen, Thach And, & Nowak, 2007). These mentors could be family, peers, friends, colleagues, or partners. One participant reminisced about how his world changed when his cousin taught him about wine, as before that he didn't know that you got '*different types and flavours of wine*'. Many of the male participants said that they began drinking wine when they entered new relationships, using wine to woo or impress their partners, but they soon acquired the taste. Wine was also linked to work related / formal socialising. Wine is seen as more situationally appropriate at formal or work related occasions (Giacalone et al., 2015). At least one participant in each group mentioned being exposed to wine through work. Some participants attributed the start of their wine consumption to repeated exposure to wine at business functions and influence of knowledgeable older co-workers. It should also be noted that all participants, regardless of gender, were also afforded the opportunity for work related

socializing (for example business dinners or entertaining clients), where wine is usually the beverage of choice as it is deemed a gender-neutral and formal alcoholic beverage.

3.1.5 Stage 4 - Growing sophistication

The growing sophistication stage seems to coincide with changes in drinking habits, which occur when approaching middle-age. Compared to life in their twenties, the mood and pace of socialising has slowed. Drinking alcohol is less about getting drunk and more about self-actualisation. Whilst some may still enjoy the higher energy night out on the town, for the most part socialising is now more relaxed, and a time to connect with friends, family and partners. Consumers tend to appreciate wine and what it offers in terms of relaxation and food pairing.

As was found by Tach (2012) and Olsen et al. (2007), females, both black and white, see wine as a tool for relaxation. A glass of wine at the end of the day helps one to wind down and de-stress. This was not found to be true for the male participants. For the males, socializing habits evolve from fast-paced, high-energy nights on the town when they were young, to more relaxed evenings with friends, family, or partners as they got older. Consequently, there was a change in alcohol choice from copious quantities of beer and spirits, to more moderate consumption of wine, beer and whiskey. The male participants also noted that with age comes a lowered tolerance for alcohol, '*I can't drink as much beer as I used to, but I can have wine with dinner*'. Although some males said; '*I generally start my drinking with a beer and end up drinking wine with dinne*r'.

For all participants at this stage, '*paring wine with food becomes a priority'*. With increasing wine knowledge consumers start to choose wines according to what meals they have. '*If I am having fish, I will have white wine, steak I will have red*'. The females (notably the black females) mentioned how labelling is important to them, as they take note of the serving suggestions on the back labels, when choosing a wine to have with a meal.

At this stage consumers are also more health conscious, and as has been found in previous research (Liu & Murphy, 2007; Saliba & Moran, 2010) wine is seen to be a healthier life choice, as red wine consumed in moderation is considered healthy. '*A glass of wine is better than a beer, it's less bloating and has fewer calories*'. It was also brought up that one can have a glass of wine after work to relax, or whilst cooking, and still work afterwards.

Palate maturation is also some-what life stage related and can be linked with a growing sophistication stage. With age consumers move from commercial bulk sweeter wines (Charters et al., 2011) to drier estate wines and trendy brands. This is also related to relative financial stability. Financial independence and disposable income enables better quality choice and discovery of wine, '*I could now afford better things, and better wine*'. Financial freedom and

growing sophistication also places one in social, work and travel contexts that provide more opportunities to experiment with and learn about wine. Many mentioned that they attended local events such as festivals and wine tastings, which lead to increased knowledge, curiosity, interest, and confidence as a wine drinker. They were also exposed to wine culture by means of travelling to South African wine regions, or in some cases travelling abroad.

As was suggested by Ritchie (2007), and to some extent confirmed by this study, at this stage consumers tend to fit into one of two groups. The first is wine hobbyists who have a passion for wine and learning about it, and the second being the group that use wine to demonstrate being financially well off and sophisticated. This was demonstrated by consumers who stated they consume wine because it is '*perceived to have a level of sophistication*' and it shows that '*you appreciate the finer things in life'*.

It is also during this stage where the 'positive feedback' starts (Figure 1). Many of the black participants who said that they had very limited contact with wine in their childhood, now have children of their own. These children are currently being socialised to wine, by being exposed to wine, and the concept of wine being consumed for different occasions (Lesschaeve, 2011) . This is the start of what will potentially in time bridge the initial gap between the consumers from different ethnic backgrounds.

3.1.6 Stage 5 - Maturity

Wine consumption frequency (not quantity) is at its peak when consumers are older and more mature (middle aged). This potential positive correlation between age and increased wine consumption was also noted in a study on Canadian wine consumers (Bruwer et al., 2012). At maturity consumers are more confident and comfortable with their wine choices, and what it says about them, and they believe they are '*able to appreciate good wines*'.

Participants all made some reference to a maturity stage. All of the females and most of the male participants said that they had not personally reached this stage, and that they were required to broaden their knowledge and experience with wine before they could possibly reach 'maturity'. A few of the participants regarded this stage as one that only very few experts will reach, an aspirational yet unattainable stage.

An extension of this is stage 6, the aspirations of becoming a wine collector. As was found in a study on Californian wine consumers, mostly male participants mentioned wine collecting (Thach, 2012) and see the ability to be a wine collector as an accolade, giving an air of financial exclusivity and class. Becoming a wine collector is the pinnacle of the wine journey, but most consumers agree that this has requirements like sufficient wine knowledge, knowing what

wines to buy and store, and having an adequate space to store them correctly, as well as adequate disposable income. The consensus amongst participants was that for the average consumer it is an unrealisable dream, and the majority of the female participants were not interested in collecting wine at all, '*why buy wine and store it when I can enjoy it now?*'.

3.2 Context of consumption

The biggest influence on wine consumption is the context in which it is consumed. What the occasion is, where one is, when it takes place and who one is with, all define the 'context' (Figure 2). A few studies have found context to be an important factor affecting alcohol consumption (Gómez-Corona et al., 2015; Silva et al., 2016).

As suggested by Silva et al. (2016), the first and most important factor of wine consumption that is considered, is the occasion. The second most important factor is the venue where the consumption will take place, and the third factor is whether a meal is involved. Other important factors are: the attendees, whether it is a business function or a relaxed social event, and when it occurs such as whether it is during the day or evening and whether it is in summer or in winter. Once all of these factors have been taken into consideration, budget is usually the deciding factor.
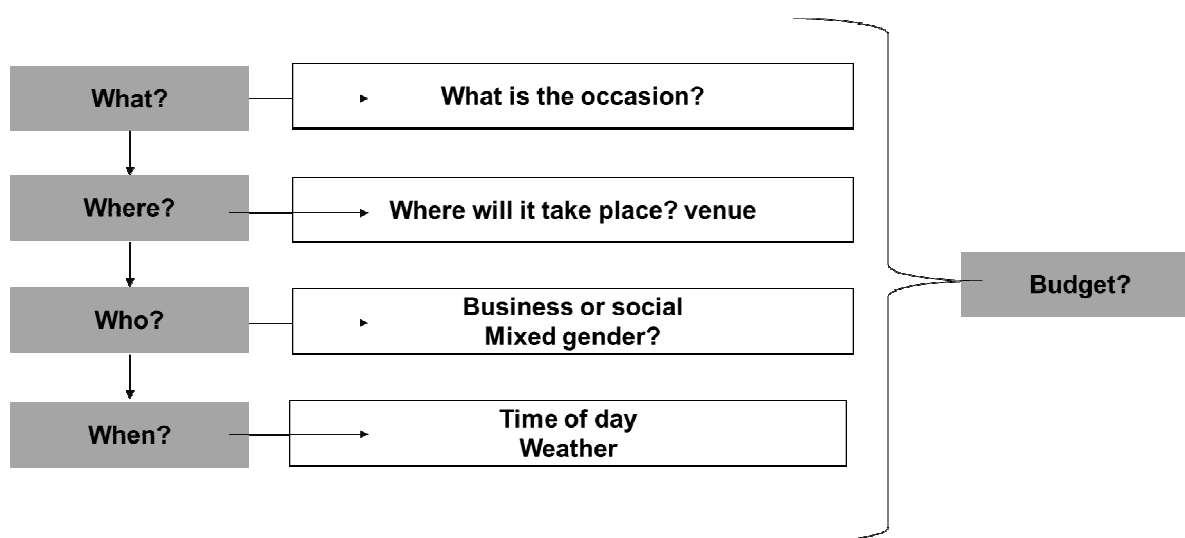
Figure 2 Summary of major factors that influence wine consumption

For the males interviewed the occasions where wine is not an option are social occasions when they gather in groups, like when watching a sports match at the stadium/bar/pub, or a boys night out. These occasions were described as large, social, high energy, less engaged male bonding. This is however in contrast to females whom when socializing together will most often have wine as their first choice, and will only occasionally have a cider or a gin and tonic.

Occasions where wine is excluded include African cultural rituals or ceremonies, for example, funerals or Lobola negotiations. Unlike a dowry, lobola is a payment made by a prospective husband to the family of the bride, and demonstrates how much both sides value the woman. During lobola negotiations, the potential groom purchases an expensive bottle of spirits (usually premium whiskey) to impress his potential father in-law. In the African culture funerals are large community affairs, food and beverages are supplied, and alcohol is usually consumed. Typically at these funerals, males said they drink beer, and females agreed that they were more likely to consume ciders or other ready to drink beverages mostly for convenience reasons, as they do not require glasses, they can be consumed straight from the container. They are aware of wine etiquette, for example not drinking straight from the bottle, and are not willing to compromise for the sake of convenience. Another reason that was mentioned for excluding wine was the cost, as it would be too expensive to supply it for large groups of people.

Another context where consumption differs is at home. Female participants mentioned that they frequently have a glass of wine when they get home to help relax after a stressful day and this was not the case for the males. For the males, wine consumption was strongly linked to a social occasion, and this finding is not limited to wine but has also been found to be true for beer consumption (Gómez-Corona et al., 2015). Females, however, have integrated wine into their everyday lives, and it is used as an '*end of the day wind down*'. Females are more likely to enjoy a glass of wine at home on their own for their own enjoyment. They described this as '*me time*', and it may take the form of having a glass of wine '*while making dinner*', or having a glass of wine while '*watching TV or reading*'.

Occasions that are popular for wine include work functions, business lunches or dinners and a more formal context that is conversation orientated. All the focus groups agreed on this, and this finding is similar to that of Silva et al. (2016) in a study on beer and wine consumption in the Netherlands and Portugal.

In a study of wine consumers in the United Kingdom (UK), all participants stated the important relationship between food and wine, and how wine is the beverage of choice to accompany meals (Ritchie, 2007). However, at informal dinner parties or braais (barbeques) males said they are most likely to start the evening off with beer and switch to wine when they eat. Pairing wine with meals has also helped enhance its acceptability amongst men. An emerging trend amongst black consumers, both male and females, is the idea of matching your meal and your wine, as the wine is seen to enhance the experience. This is somewhat linked to sensory, saying that pairing wine with food '*changes or enhances the taste of the wine*', but could also be explained as trendy behaviour somewhat linked to the social status that wine brings. It seems

as though black consumers are more conscious and interested in keeping up with current trends and brands than their white counterparts.

Season also heavily influences wine or alcoholic beverage choice. During summer consumers are most likely to consume a chilled white wine at informal social gatherings, and in the case of females sometimes rosé. In winter however, consumers are more likely to have a red wine.

Alcohol choice is context based, but also governed primarily by budget. The female participants mentioned that an important consideration when choosing to drink wine is '*how long will I be out*?' A long night of socialising means a large number of drinks to purchase and consume. Consequently, participants were likely to then ask, '*what can get me the best value for money*?' Better quality wine is more expensive therefore they may choose to go for something more cost effective like ciders and other ready to drink beverages. Male participants also brought up price and compared wine to whiskey, arguing that although you pay more for whiskey, you get more glasses out of a bottle, and you can store the bottle for an unlimited period of time once it has been opened, unlike wine.

3.3 Social, emotional and functional conceptualisations

Something that all the participants, across all groups agreed upon is that wine is a sophisticated beverage. Choosing to drink wine is deemed to elevate your class and elegance as it appears more sophisticated than beer and spirits. When asked what made wine sophisticated, participants mentioned a few things, including the look and feel of a wine glass, '*holding the stem*', '*swirling the glass*', all add to the air of sophistication. Wine was also said to be like art, and that you learn to appreciate it. There was emphasis placed on the idea that drinking wine raises one's status, you '*exude confidence*', and it shows that you have an appreciation for the finer things in life. This notion of social status was also reported as a strong motivation for wine consumption in Vietnam (Do, Patris, & Valentin) and in the UK where wine consumers conceptualised wine as classy and sophisticated (Ritchie, 2007). The sophisticated image probably stems largely from the media, where wine is often associated with money, success and status. Due to wine's sophisticated nature, it is well suited to formal and conversation orientated events.

Male participants agreed that there is a larger thought process with wine, compared to beer which you can simply choose spontaneously without much thinking: '*A beer is a beer*'. However, one participant noted that craft beer has the potential to change this. There are many things to consider including occasion, whether there will be a meal, red/white/rosé/ sparkling, cultivar, and brand. For the male participants wine is also a symbol of romance and a means for impressing one's partner with your level of refinement when you are sharing wine. When you

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and your partner have dinner, '*you open a nice bottle of wine'*. It shows sophistication, and that you have thought about it, '*you have not simply cracked open a beer'*. One female participant stated that she only started drinking wine regularly when she got married because her husband told her she needed to '*stop drinking ciders and be more sophisticated*'.

In a public setting, females see wine as a confidence booster, and knowledge of wine is seen as a sort of social currency. Contrastingly, at home wine is seen as an aid for tension release and relaxation as discussed in the section of context of consumption.

Influence of 'others' was also mentioned. When organic wine was mentioned, one female participant says she likes organic wine, but she only drinks it at home where people won't judge her choices: '*When I'm at home I'll drink organic wine where people can't see and judge me'*.

3.4 Cultivars and sensory perception

All participants were asked to bring a bottle of wine along to their respective groups. Each participant was required to show the group their wine and say something about why they enjoy it, or why it appeals to them. Participants used words like '*delicious*' and '*nice*', but battled to articulate what exactly they like or dislike about a wine in terms of its sensory characteristics. Very little reference was made to any specific taste in white wine. Consumers vocabulary was limited to the descriptors '*citrus*' and '*wood*'. Participants seemed to find it easier to describe red wines and had a larger vocabulary, using words such as '*woody'*, '*spicy', 'chocolate'* and '*rich'*. Participants also used more abstract or emotional descriptors including '*cuddly*', '*500 thread count*', *'luxurious', 'depth', 'velvety'*, and '*comforting'* to describe red wine. These descriptions have emotional connotations of comfort and luxury which could explain the emerging trend that consumers seem to favour red wine and view it as superior to white wine.

A hierarchy was observed when wine was discussed. Champagne/MCC/sparkling wine is the top tier, followed by red wine, then white, then Rosé. When asked about it, participants said they used price and the associated assumed quality as the basis for the hierarchy. When looking at all the transcripts champagne/MCC/sparkling wine were mentioned more regularly than white and rosé. The few times when white wine was discussed consumer knowledge was limited to Sauvignon blanc and Chardonnay. These wines were seen as two extremes and consumers had a preference for one or the other that seemed to be based on the absence or presence of wood flavours. White wine in general, would seem to benefit from further research in this regard.

The most mentioned cultivars across all groups (in order from most to least mentioned) were Merlot, Pinotage, Cabernet sauvignon, Shiraz, Sauvignon blanc and Chardonnay, which is to be

expected as these wines are the "big six" noble varieties (Davids, 2004). Interestingly Chenin blanc which is the most planted grape varietal in South Africa (Davids, 2004) was only mentioned by 2 of the 6 focus groups. White males and black females seemed to have broader knowledge of cultivars.

Rosé wine, was not mentioned very often. Females were mostly positive saying it was good for a hot summers day, however to the male participants, rosé is seen as a stereotypical '*feminine*', '*pink drink*' and not something that should be consumed by '*real men'.* A study done by Velikova et al. (2014) found that consumers in the United States and New Zealand also perceive rosé wine as feminine, and interestingly all three countries are new world wine regions.

3.5 Price and purchasing

As found by various consumer studies on numerous products, all consumers, regardless of ethnicity, rely heavily on price as an indicator of quality and it is one of the top purchase drivers (Liu & Murphy, 2007; Velikova & Dodd, 2016). The focus groups confirmed that wine purchasing is mostly convenience based and consumers rely heavily on price to guide their purchasing. Without a price attached to a bottle, the value is easily obscured and elusive to those who have limited wine knowledge.

Interestingly, red wine is regarded as superior to white wine. Participants stated that they are generally willing to spend more money on red wine than white wine, and especially if the bottle has a cork. The price consumers are willing to pay however also depends on the nature of the occasion. The more they are trying to impress, the more money they will spend. Wine is now a popular contemporary gift that consumers buy for friends and colleagues. Gifts of relatively expensive sparkling or red wine are deemed to have acceptable value.

Although males do purchase wine, it was found that females do so more regularly as wine purchases often occur alongside everyday grocery shopping. Wine purchasing is often convenience based: '*If I'm just picking up groceries, then I can walk down the wine aisle it costs me 1 minute as opposed to the 15min waste of going to a [liquor] store*'. Males of both cultural groups stated that they are more likely to buy wine when it is for a specific or special occasion and will often make a special trip to make the purchase.

3.6 Closures

On the topic of bottle closures, all participants seemed to agree; there were no differences in opinion between the cultural groups or genders. The consensus among participants was that white wine can have a screw/twist cap, but red wine should have a cork. Consumers attach value to the cork, and the male participants agreed that they particularly enjoy the ritual of

popping the cork from the bottle, breaking a seal on a twist cap is '*not as satisfying*'. Some consumers see the twist/screw caps as convenient as it eliminates the need for a bottle opener and the bottle can be resealed easily. Apart from enjoying the ritual of '*popping the cork*', participants believe cork to be an integral part of wine quality, and are willing to spend more on a bottle with a cork. It was noted that participants perceive wine with a cork to be more expensive and therefore to be of a better quality. Consumers believe wine with a cork '*tastes different*' from wine with a twist cap, but could not say how exactly the taste differed. One black female participant simply said: '*if it does not have a cork, it is not proper wine*'. Females mentioned that wine with a screw cap, especially red, is only good for cooking. Participants also perceived a link between twist caps and high sulphur content, which they, in turn, related to headaches. The connection between sulphur and headaches seems to be an international phenomenon. Costanigro et al. (2014) in their study of American wine consumers also found that 34% of their test population found that they develop headaches after drinking wine and, also attributed it to sulphur content, although at this stage there is no medical evidence to support this phenomenon.

3.7 Health

With increased personal and professional responsibilities, alcoholic beverage choices have changed. With increasing age comes a lower tolerance for alcohol and its physiological effects such as discomfort and diminished capacity to function optimally the next day (Agahi, Kelfve, Lennartsson, & Kåreholt, 2015). The male participants said that in their youth they could drink beer, but now find beer bloating, so they prefer a glass of wine as '*it doesn't give me heartburn or a headache*'.

Extant wine research (Yoo, Saliba, MacDonald, Prenzler, & Ryan, 2013) found that, generally consumers believed wine was a healthier alcoholic beverage when compared to other alcoholic beverages. This healthier perception was especially applicable to red wine: '*red wine is the best alcoholic drink you can have*'. Interestingly when asked why, participants could not explain why red wine was the healthier choice, most said that they had heard it somewhere (but couldn't remember where), and only one made mention of '*antioxidants*', but again did not know what they were or why they were good.

3.8 Barriers

Barriers towards wine consumption were verbalized by the non-connoisseur consumers similarly to other studies on alcoholic beverages (Gómez-Corona et al., 2015). Participants stressed the fact that wine is intimidating, and a lack of knowledge and comfort with acceptable practices around its consumption diminishes their inclination to "*stick with it*". One black male participant highlighted the fact that different types of wine glasses are a barrier: "*You have to*

think am I drinking out of the right glass? You know, are people going to say I don't know what I'm doing, but beer you can just pour in the glass and drink." Another participant at the same group then mentioned how he himself "*judged*" someone for their lack of wine etiquette, which was the over filling of a wine glass with expensive wine which he had purchased: "*I judged. They were drinking an expensive bottle of wine, which I had bought, and filled up the entire glass. And I'm thinking that is not how you drink it*".

 Another small but notable issue was that the majority of participants were not aware of the difference between Method Cap Classique, Sparkling wine and champagne. "*Is there a difference, they all have bubbles*". There was emphasis on the higher sulphur content in wine with a screw/twist cap, and associated negative health connotations. Participants found the term vintage confusing, and they used the terms '*vintage*' and '*blend*' interchangeably with '*cultivar*'. Some participants referred to the cork imparting wood aromas in wine and used the terms '*cork*' and '*oak*' interchangeably. These misconceptions are most likely a result of limited wine knowledge.

Wine is neither traditional nor masculine. Beer, whiskey and brandy dominate as masculine, male bonding beverages. Male participants also noted the low volume to price ratio for wine when compared to other alcoholic beverages such as whiskey, "*you get fewer glasses for more money when compared to whiskey*". Male participants noted that they were reluctant to start drinking wine, as they had to justify it when socializing with beer or whiskey drinkers. It was noted by the black male consumers, that "*Traditionally black men would not drink wine, it's a girly thing*"*.* The older generation of black men (Gen X and older) who for political reasons were not exposed to wine in the past do not generally consume wine, however, the younger generations, belonging to generation Y are more exposed and are starting to develop an appreciation for wine. Rosé however continues to have a feminine identity. In all cultural groups investigated, male participants referred to it derogatorily as a "*pink drink*" which should only be consumed by females. Aside from the stereotypical feminine image, another barrier is how it is consumed. The functional conceptualisations around wine glasses are that they are impractical at large, informal, high energy occasions, and something like a cider is more appropriate as it does not require glasses and can be consumed from the container. Wine is better suited to occasions where you are seated at a table. The quantity of a wine in a bottle is also to some extent perceived as a barrier, as it is usually something that is opened to be shared, not consumed on one's own, and once it's open, it must be consumed and cannot be kept for an indefinite time like whiskey.

The historical gap between the ethnic groups in respect of wine consumption and appreciation is narrowing with time and the black consumer groups all made reference to this with increasing

awareness, visibility and the acceptance of wine in their peer groups. This is due to increased exposure and frequency of wine consumption occasions, trade shows and events making it more accessible, as well as the fact that wine is more readily available at convenience stores.

4. Conclusion

For the investigated population of urban consumers, the most notable and predominant observable differences were ultimately between males and females. Wine is usually the first-choice alcoholic beverage for females on most occasions, but this is not the case for males. Males will generally choose to drink beer or whiskey first, but will drink wine when it accompanies a meal.

With regards to ethnicity, this study did not reflect a large distinction between the different ethnic groups. Although the black consumer group had a relatively delayed start to their wine consumption, their motivations for drinking wine and perceptions do not seem to differ greatly from that of their white counterparts. Given that the two ethnic groups that we investigated had very similar socio-demographics, and levels of wine knowledge, it is not surprising that there are limited differences between them, and that the conceptualisations of wine were similar. This leads to the hypothesis that as consumers' socio-demographics (income, lifestyle) become similar, so do their wine preferences. Had the study included consumers with more wine knowledge there may have been more cultural differences.

Journey was also an important theme. Four main stages of the consumer journey, were identified, and seem to be mostly age related. With age, the focus moves from intoxication on the cheapest alcohol available, to appreciation of the taste, the sophisticated nature and how wine compliments a meal.

In South Africa it seems that wine has the tendency to be consumed for symbolic reasons as it represents material wealth, and social status. All participants regardless of ethnicity or gender see wine as a symbol of sophistication and class, however, there was more emphasis from the black consumers on wine as an aspirational lifestyle beverage. Champagne/sparkling/MCC and red wine are seen as the most sophisticated alcoholic beverages. White wine is less sophisticated and more appropriate for day time or relaxed consumption. South African consumers see Rosé as a feminine beverage, not suitable for men to consume. As was found to be true for both French and New Zealand wine consumers (Mouret et al., 2013) wine in South Africa is also seen as a beverage that is meant to be shared, either with friends, colleagues, family or one's partner.

Wine is a complex product and the unspoken "*rules*" and etiquette associated with it, add to its sophisticated image and helps differentiate it from other alcohol categories. Overall wine has a positive image, but limited wine knowledge is a large barrier towards greater wine consumption. Consumers fear embarrassing themselves by not consuming it in the correct manner, but often this barrier is broken down by a 'wine mentor' (someone older with more wine knowledge).

When it came to cultivar and sensory perceptions, consumers seem to have more knowledge of red cultivars and are more comfortable discussing red wine. Participants gave very little reference to particular tastes in white wine apart from citrus and the presence or absence of wood. Future research should focus on exploring consumers sensory perceptions of white wine.

When looking at the eleven main themes that were identified, the majority of these fell into the category of social/emotional factors, which leads to the hypothesis that social and emotional factors have a strong impact on wine consumption. More in-depth motivational analysis could help to further investigate this concept.

This is the first study to focus on understanding the changed landscape of SA wine consumers and the results will be used to guide future research on consumers' familiarity with specific wine styles. This study focused on a small specific population, and future research could expand on this study using larger population samples, including: other ethnic groups, consumers with varying levels of wine knowledge, as well as consumers from other regions of South Africa.

4.1 Implications for the wine industry

Based on these findings, there are a few challenges that the wine industry faces. Firstly, to change feminine perceptions of wine. This could potentially be done by using a masculine celebrity as a brand ambassador (or for marketing purposes) to endorse wine consumption. Using women and occasions that are familiar to the consumer in wine marketing, could also assist in attracting consumers. Secondly, this research showed a strong emphasis by consumers on wine with meals. Generally South African consumers see wine as an ideal accompaniment to meals and feel it enhances the dining experience. Consequently, consumers are looking for affordable wines, that pair well with food. The wine industry should use this to their advantage. Market wines for their versatility for food paring, or easy drinking nature. Consumers are also price and closure conscious and use these as cues to determine whether wine is of good value and worth purchasing.

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Chapter 4

Development of a Wine Choice Questionnaire for the investigation of consumers' motivations for wine consumption

Chapter 4: Development of a Wine Choice Questionnaire for the investigation of consumers' motivations for wine consumption

1. Introduction

Wine is "timeless", it has been consumed since the years A.D. and is still consumed today. Reasons or motivations for consumption, have however changed over time, and can be different for different groups of consumers. Previous research has shown that food and beverage consumption is not based on sensory preference alone, but on many factors (Barber, Almanza, & Donovan, 2006; Gómez-Corona, Escalona-Buendía, García, Chollet, & Valentin, 2015; Hall, Shaw, & Doole, 1997). Lockshin & Corsi (2012) noted the importance of investigating consumer motivations in their review article on wine consumer research. It was therefore of interest to consider a tool specifically developed for investigating motivations for wine consumption, which could potentially be used for cross-cultural motivation research.

Investigating food choice and specifically understanding motives for food consumption has always been an important topic in consumer research. The food choice questionnaire (FCQ) was developed by Steptoe et al. (1995) and is a multidimensional measure, to access the perceived importance of multiple factors as motives for food choice. It was originally developed to investigate food consumption, and consumer health and psychology. The original questionnaire consisted of 36 terms, belonging to 9 factors namely: health, mood, convenience, sensory appeal, natural content, price, weight control, familiarity, and ethical concern. The results of the study showed that motives for food choice were influenced by gender, age, and income.

Several studies have since employed the FCQ for cross-cultural research. Prescott et al. (2002) used the FCQ to determine factors that influence food choice in different cultures, comparing the motivations of consumers from Japan, Taiwan, Malaysia, and New Zealand. Results showed that culture influences motivations e.g. for Japan the factor that scored the highest mean was price, whereas for New Zealand the factor that scored the highest mean was sensory appeal. Studies have also investigated the cross-cultural validity of the FCQ. Eertmans et al. (2006) used western urban consumers from Canada, Belgium and Italy. They concluded that some items in the questionnaire have different connotations in different countries, and that the questionnaire is not generalisable across western populations. However, Markovina et al. (2015) used consumers from 9 different European countries, and found the questionnaire

suitable for comparing European populations. Both studies also reported cultural influences on motivations.

A group of researchers in Cape Verde, worked on applying and validating the food choice questionnaire for use in an African country, as well as to establish consumer groups based on motivations (Cabral, de Almeida, & Cunha, 2017). Their research revealed nine factors similar to Steptoe et al. (1995), and they concluded that the food choice questionnaire is applicable transculturally. The FCQ was also proved to be a valid and reliable research instrument for use with Turkish consumers (Dikmen, Inan-Eroğlu, Göktaş, Barut-Uyar, & Karabulut, 2016).

There is not much published research on product specific adaptations of the food choice questionnaire. Pieniak et al. (2009) used the FCQ to determine motivations for traditional food consumption in Belgium, France, Italy, Norway, Poland and Spain. Wang et al. (2014) adapted the FCQ to investigate mainland Chinese consumers motivations for choosing traditional food versus European food. Lindeman & Väänänen (2000) also adapted the FCQ adding items concerning vegetarianism and ethical food choices The FCQ was also successfully adapted to investigate motives for organic versus conventional food consumption (Baudry et al., 2017). Items from 5 factors in the original questionnaire were adapted and factors concerning absence of contaminants, avoidance for environmental reasons, innovation, and local & traditional production were added.

Motivations for wine consumption have been investigated but a multi-dimensional measure like the FCQ has not been developed. Motivations are often investigated in qualitative research and then a questionnaire is put together which fits the purpose of a specific study (James & Christodoulidou, 2011; Neves, Teixeira, & Ferreira, 2015). Given that the FCQ has been proven to be robust and cross-culturally applicable it was therefore seen as a good starting point to develop a wine motivation questionnaire. The aim of this research was to investigate South African consumers motivations for wine consumption using an adapted version of the FCQ, and to compare the relative importance of factors across different consumer segments. This work was the first step in developing a tool to aid in the investigation of consumer wine choice, helping to feed the broader aim of the WISE initiative (Basson, 2014) to grow South Africa's domestic wine market.

2. Part 1: Methods and Materials

This study was carried out in two parts. Part 1 was the development and pre-testing of the questionnaire. Consumers pre-tested the questionnaire to ensure clarity of questions and stability of the questionnaire (Barrios & Costell, 2004). The aim of part 2 was to pilot test the questionnaire and investigate the reliability of the scale.

2.1 Questionnaire development

The questions in the original food choice questionnaire (Steptoe et al., 1995) were adapted to be specific for wine. Questions in the existing questionnaire were removed if irrelevant or re-worded to be more applicable to wine. In addition to this questions were added based on findings from the focus group in research chapter 3 and a review of the literature (MacDonald, Saliba, & Bruwer, 2013). Table 1 shows the themes that were identified in research chapter 3's focus groups, and the subsequent questions that were developed.

Table 1 Themes identified during the focus groups in research chapter 1 and the corresponding questions used in the wine choice questionnaire.

Theme	Questions	Factor in WCQ
Social/Emotional	Makes me look/feel sophisticated Makes me feel confident Is what my peers are drinking	Social
Familiarity	Is what I usually drink Is a well-known brand name	Familiarity
Sensory	Goes well with my food	Sensory appeal
Price	Price is an important indicator of quality	Price
Closures	Has a screw cap Has a cork	Convenience
Health	Is good for my heart Contains antioxidants Is a treat	Health
	Is low in sulphur Is organic Is biodynamic	Natural
Ethics	Is made in South Africa and supports the local economy	Ethical concern

Table 2 shows the questions in the pre-test questionnaire. Nineteen of the original 36 items were kept, 16 others were added or adapted e.g. *'Is good for my skin/hair/teeth*', was changed to *'is good for my heart',* as wine is not considered to be good for one's skin, teeth or hair, but rather for one's heart. The health and weight control factors were combined. Given the emphasis on the social and emotional aspects of wine during the focus groups of research chapter 3. A new factor called *social* was introduced, containing the questions/items: "*makes me look/feel sophisticated*", and "*makes me feel confident*". Each factor can be described as a latent variable, as it is not directly measured but is inferred from the rating of the items belonging to it. The items in the questionnaire were presented in a randomised order. Each item was required to be rated on a four-point Likert scale (Eertmans et al., 2006; Steptoe et al., 1995) ranging from 1 – not at all important to 4- very important.

Table 2 Pre-test wine choice questionnaire adapted from Steptoe et al. (1995). Questions in italics were not present in the original questionnaire.

It is important to me that the <u>wine</u> I drink on a typical day:	
1. Health	
1	Is low in calories
2	*Contains antioxidants*
3	*Is good for my heart*
4	Keeps me healthy
5	*Is low in alcohol*
2. Mood	
6	Helps me cope with stress
7	Helps me to cope with life
8	Helps me relax
9	Cheers me up
10	*Is a treat*
11	Makes me feel good
3. Social	
12	*Makes me look/feel sophisticated*
13	*Makes me feel confident*
14	*Is what my peers are drinking*
4. Convenience	
15	*Has a screw cap/ Can be re-sealed*
16	*Has a cork*
17	Is easily available in shops and supermarkets
18	Can be bought in a shop close to where I work/live
5. Sensory appeal	
19	Smells nice
20	Looks nice/ Has a good colour
21	Has a pleasant texture/ body/mouthfeel
22	Tastes good
23	*Goes well with my food/meal*
6. Natural content	
24	*Is low in sulphur*
25	*Is organic*
26	*Is biodynamic*
7. Price	
27	Is not expensive
28	Is cheap
29	Is good value for money
8. Familiarity	
30	Is what I usually drink
31	Is familiar
32	*Is a well-known brand name*
9. Ethical concern	
33	*Is made in South Africa and supports the local economy*
34	*Is produced with ethical production methods*
35	Is packaged in an environmentally friendly way

2.2 Participants

For the pre-test the snowball technique (Fink, 2003) was used to gather a convenience sample of 135 participants, including students and staff at the university, who consume wine at least twice a month. Demographics of the participants can be seen in Table 3.

Table 3 Summary of demographics of the pre-test participants.

Variable	Categories	Frequencies	Percentage %
Gender	Female	93	68.9
	Male	42	31.1
Generation	X (age 36+)	60	44.4
	Y (age 21-35)	75	55.6
Ethnic group	Black*	29	21.5
	White*	106	78.5
Province	Gauteng	69	51.1
	Western Cape	66	48.9
Total		135	100.0

*Classification according to Statistics SA (Statistics South Africa, 2015).

2.3 Procedure

The pre-test questionnaires were administered by hand in a pen and paper format. Addendum A is an example of the questionnaire. Participants were required to rate the importance of each item on the questionnaire on a four-point scale, 1 – not at all important, 2 – slightly important, 3 – moderately important, and 4 – very important (Steptoe et al., 1995). Demographics of the participants were also recorded.

2.4 Data analysis

Mean scores for each item were first calculated. Then factor scores were calculated by averaging item ratings per factor, resulting in a number between 1 and 4, 1 being unimportant, and 4 being very important. Significant differences between factor means were calculated using one way analysis of variance (ANOVA) and Tukey post hoc test (Januszewska, Pieniak, & Verbeke, 2011) for least significant means (LS Means). As described by Cabral et al. (2017), Cronbach's Alpha was used to calculate the internal reliability of each factor. All statistical analysis was done using XLSTAT 2017, Addinsoft, Paris, France (2017).

3. Part 1: Results and Discussion

Table 4 shows the mean scores and standard deviation for each item and factor, as well as the Cronbach's alpha for each factor. Cronbach's alpha is a measure of the internal reliability i.e. the intercorrelation between items, and a value of 0.6 and above is considered reliable (Žeželj, Milošević, Stojanović, & Ognjanov, 2012). The factors convenience, natural content, and familiarity showed only low to moderate reliability, scoring 0.54, 0.58, 0.50 respectively (Table 4).

Table 4 Mean and standard deviation for each item and factor as well as the Cronbach's alpha for each factor. Superscript letters indicate significant differences between factors at a 95% confidence level (Tukey HSD).

Number	Item	Mean	SD	Cronbach's Alpha
Factor 1	**Health**	**1.90^d**	**0.72**	**0.76**
	Is good for my heart	2.24	1.11	
	Keeps me healthy	2.10	1.03	
	Contains antioxidants	1.80	0.97	
	Is low in alcohol	1.67	0.89	
	Is low in calories	1.66	0.97	
Factor 2	**Mood**	**2.09^{bc}**	**0.59**	**0.79**
	Is a treat	3.11	1.00	
	Cheers me up	2.71	1.16	
	Helps me relax	2.49	0.28	
	Makes me feel good	2.28	1.13	
	Helps me cope with stress	1.50	0.75	
	Helps me to cope with life	1.48	0.88	
Factor 3	**Social**	**1.62^e**	**0.82**	**0.7**
	Makes me look/feel sophisticated	1.64	0.96	
	Makes me feel confident	1.61	0.91	
	Is what my peers are drinking	1.39	0.76	
Factor 4	**Convenience**	**2.42^{bc}**	**0.67**	**0.54**
	Is easily available in shops and supermarkets	2.95	1.04	
	Can be bought in a shop close to where I work/live	2.88	1.03	
	Has a screw cap/ Can be re-sealed	2.06	1.12	
	Has a cork	1.78	0.91	
Factor 5	**Sensory appeal**	**3.31^a**	**0.59**	**0.74**
	Tastes good	3.81	0.55	
	Has a pleasant texture/ body/mouthfeel	3.50	0.82	
	Smells nice	3.20	0.93	
	Goes well with my food/meal	3.12	0.86	
	Looks nice/ Has a good colour	2.93	1.02	
Factor 6	**Natural content**	**1.88^{de}**	**0.69**	**0.58**
	Is low in sulphur	2.07	1.04	
	Is organic	1.89	0.94	
	Is biodynamic	1.67	0.83	

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Table 4 continued

Factor 7	Price	2.39[bc]	0.78	0.74
	Is good value for money	3.14	0.93	
	Is not expensive	2.25	1.00	
	Is cheap	1.79	0.94	
Factor 8	Familiarity	2.22[c]	0.8	0.5
	Is what I usually drink	2.33	1.03	
	Is familiar	2.10	0.94	
	Is a well- known brand name	2.07	1.02	
Factor 9	Ethical concern	2.52[b]	0.79	0.6
	Is made in South Africa and supports the local economy	2.59	1.07	
	Is produced with ethical production methods	2.60	1.12	
	Is packaged in an environmentally friendly way	2.36	1.01	

The factors ranked in terms of importance were sensory appeal, ethical concern, convenience, price, familiarity, mood, health, natural content, and social. Overall sensory appeal was the most important factor/motivation, and received the highest overall mean score of 3.31. This is not surprising as this was an important factor mentioned during the focus groups in research chapter 3, and sensory appeal has been shown to be important in wine consumption (MacDonald et al., 2013).

Interestingly in a study that used the FCQ in a number of European countries, ethical concern and familiarity were ranked as the least important motives for food choice (Markovina et al., 2015). The contrast however in this study specifically looking at wine, showed ethical concern as the second most important factor, after sensory appeal. This could be due to the current focus of the media on environmental issues, and more specifically the drought in South Africa at the time when this study was conducted. It could also to some extent be due to the issues with labour and exploitation of workers in the farming industry in South Africa's recent history. This is however a complex topic and would require further in-depth investigation.

The social factor scored surprisingly low, given the results of the focus group, where social aspects come out as strong motivations. We hypothesise that changing the phrasing of questions, and asking less direct questions will change this result.

4. Part 2: Methods and Materials

4.1 Questionnaire development

For part 2, the pilot test, questions were updated or adapted based on the results of the pre-test. The structure remained the same, with the phrasing of questions being changed as well as

the addition of some questions. Table 5 depicts the final list of items/questions used in the pilot study.

The item *'is a treat'* was noted by several consumers as being confusing, however when it was explained as being an indulgence it was better understood, and the item was therefore changed to *'is a treat/indulgence'*. Looking at the results of the pre-test, the social factor was the least important factor. This was unexpected after seeing the importance of the social connotations during the focus groups in research chapter 3. It was then decided to change the questions under the social factor, from less direct question to more inferred questions. *'Could be given as a gift', 'could be served to guests', can be stored and aged', is a popular brand'* and *'has won medals or awards'* were added to the social factor and *'makes me feel sophisticated', 'makes me feel confident'* and *'is what my peers are drinking'* were removed. *'Can be purchased online'* was added to the convenience factor. *'Is sweet'* and *'is dry'* were added to the sensory appeal factor. *'Is highly priced'* was added to the price factor. *'I have tasted before', 'is a familiar cultivar',* and *'is a familiar style'* were added to the familiarity factor.

Table 5 List of questions by factor for the pilot wine choice questionnaire. Questions in italics were added or changed from the pre-test questionnaire.

It is important to me that the <u>wine</u> I generally buy/drink:	
1. Health	
1	Is low in calories
2	Contains antioxidants
3	Is good for my heart
4	Keeps me healthy
5	Is low in alcohol
2. Mood	
6	Helps me cope with stress
7	Helps me to cope with life
8	Helps me relax
9	Cheers me up
10	*Is a treat/indulgence*
11	Makes me feel good
3. Social status	
12	*Could be given as a gift*
13	*Could be served to guests*
14	*Can be stored and aged*
15	*Is a popular brand*
16	*Has won medals/awards*
4. Convenience	
17	Has a screw cap/ Can be re-sealed
18	Has a cork
19	Is easily available in shops and supermarkets
20	Can be purchased in a shop close to where I work/live
21	*Can be purchased online*
5. Sensory appeal	
22	Smells nice
23	Looks nice/ Has a good colour
24	Has a pleasant texture/ body/mouthfeel
25	Tastes good
26	Pairs well with my food/meal
27	*Is sweet*
28	*Is dry*
6. Natural content	
29	Is low in sulphur
30	Is produced using organic farming practices
31	Is produced using biodynamic farming practices
7. Price	
32	*Is highly-priced*
33	Is not expensive
34	Is cheap
35	Is good value for money
8. Familiarity	
36	Is what I usually drink
37	Is familiar
38	*I have tasted before*
39	*Is a familiar cultivar*
40	*Is a familiar style*
9. Ethical concern	
41	Is made in South Africa and supports the local economy
42	Is produced with ethical production methods
43	Is produced/packaged in an environmentally friendly way

4.2 Procedure

For the pilot test the procedure was much the same except the questionnaire was completed online. Participants were again required to rate the importance of each item on the questionnaire on a four-point scale, 1 – not at all important, 2 – slightly important, 3 – moderately important, and 4 – very important, and this time the items were presented in a randomised order. Various demographics of the participants were also recorded, and the 10 point personal involvement inventory scale (Zaichkowsky, 1994) was used to measure consumers involvement. An average score of less than 5 was considered to be low involvement, a score between 5 and 6 was considered medium involvement and a score over 6 was considered high involvement (Vannevel, 2015).

4.3 Participants

For the pilot study, the questionnaire was administered online, and responses were captured in Compusense® at hand (Compusense Inc., Guelph, Canada). Respondents were contacted via email and social media through wine related pages and the snowball technique was used. A total of 632 consumers completed the survey. Demographics as well as consumers' levels of involvement and knowledge were recorded and can be seen in Table 6. Recruiting consumers to participate in surveys is challenging, and although the population is not representative of the SA wine consuming population, we tried to include consumers spanning as many different demographics as we could.

Table 6 Summary of demographics of the pilot study participants.

Variable	Categories	Frequencies	Percentage %
Gender	Female	448	70.89
	Male	184	29.11
Age group	18-20	12	1.90
	21-25	108	17.09
	26-30	124	19.62
	31-35	97	15.35
	36-40	62	9.81
	41-45	54	8.54
	46-50	49	7.75
	51-55	52	8.23
	56-60	26	4.11
	61-65	31	4.91
	66+	17	2.69
Generation	X (age 36+)	229	36.23
	Y (age 21-35)	391	61.87
	Z (age 18-20)	12	1.90
Ethnic group	Asian*	4	0.63
	Black*	114	18.04
	Coloured*	23	3.64
	Indian*	26	4.11
	White*	465	73.58
Province	Eastern Cape	21	3.32
	Free State	4	0.63
	Gauteng	310	49.05
	Kwazulu-Natal	29	4.59
	Limpopo	5	0.79
	Mpumalanga	9	1.42
	Northern Cape	2	0.32
	North West	10	1.58
	Western Cape	242	38.29
Knowledge	Novice	141	22.31
	Somewhat knowledgeable	343	54.27
	Very knowledgeable	128	20.25
	Connoisseur	20	3.16
Involvement	Low	216	34.18
	Medium	212	33.54
	High	204	32.28
Total		632	100

*Classification according to Statistics SA (Statistics South Africa, 2015).

4.4 Data analysis

As for the pre-test, mean scores for each item were first calculated. Then factor scores were calculated by averaging item ratings per factor, resulting in a number between 1 and 4, 1 being unimportant, and 4 being very important. Significant differences between factor means were calculated using one way analysis of variance (ANOVA) and Tukey post hoc test (Januszewska et al., 2011) for least significant means (LS Means). As described by Cabral et al. (2017). Cronbach's Alpha was used to calculate the internal reliability of each factor. Factor averages for each group were calculated, based on gender, age/generation (Kasasa, 2016), ethnic group (Statistics South Africa, 2015) province of residence, knowledge, and involvement. This was followed by ANOVA and Tukey post hoc test for LS Means analyses. All statistical analysis was done using XLSTAT 2017, Addinsoft, Paris, France (2017).

5. Part 2: Results and Discussion

Table 7 shows the relative importance of each factor by way of the mean score and standard deviation for each item and factor, as well as the Cronbach's alpha for each factor. Using a larger number of consumers and adapting some of the questions resulted in all factors having Cronbach's alpha score of 0.6 and above, therefore they can be considered reliable (Žeželj et al., 2012). The factors convenience, natural content and familiarity which only showed low to moderate reliability, in the pre-test showed improvement in the pilot test all having Cronbach's alpha over 0.6. The intercorrelation between the items in each factor were good, however in some factors there was little correlation between the importance of the items. An example of this can be seen Table 7, where the Cronbach's alpha for factor 1 health, is 0.815 which shows good intercorrelation but the average means from *'is good for my heart'* is 2.51, to *'is low in alcohol'* is 1.70. This could be due to the latent variables, in this case the factors, being both formative and reflective. Formative variables are not expected to correlate (Christophersen & Konradt, 2012). Regardless of this, the content is still valid.

Table 7 Mean and standard deviation for each item and factor as well as the Cronbach's alpha for each factor for the pilot test. Superscript letters indicate significant differences between factors at a 95% confidence level (Tukey HSD).

Number	Item	Mean	SD	Cronbach's Alpha
Factor 1	**Health**	**2.34[c]**	**0.94**	**0.815**
	Is good for my heart	2.51	1.11	
	Keeps me healthy	2.32	1.11	
	Contains antioxidants	2.18	1.07	
	Is low in calories	2.00	1.11	
	Is low in alcohol	1.70	0.94	
Factor 2	**Mood**	**2.68[b]**	**0.82**	**0.781**
	Is a treat/ indulgence	2.89	0.93	
	Makes me feel good	2.76	1.08	
	Helps me relax	2.55	1.08	
	Cheers me up	2.53	1.12	
	Helps me cope with stress	1.76	1.02	
	Helps me cope with life	1.63	0.98	
Factor 3	**Social**	**2.91[a]**	**0.69**	**0.609**
	Could be served to guests	3.39	0.78	
	Could be given as a gift	2.90	0.92	
	Can be stored and aged	2.46	1.08	
	Has won medals/awards	1.09	0.91	
Factor 4	**Convenience**	**2.69[b]**	**0.79**	**0.635**
	Is easily available in shops and supermarkets	3.03	0.98	
	Can be purchased in a shop close to where I work/live	2.94	1.03	
	Has a screw cap/ Can be re-sealed	2.12	1.1	
	Has a cork	1.81	1.01	
	Can be purchased online	1.68	0.97	
Factor 5	**Sensory appeal**	**2.85[a]**	**0.67**	**0.611**
	Tastes good	3.92	0.31	
	Has a pleasant texture/body/mouthfeel	3.59	0.66	
	Smells nice	3.15	0.90	
	Looks nice/ Has a good colour	2.87	0.93	
	Pairs well with my food/meal	2.86	0.99	
	Is dry	2.51	1.15	
	Is sweet	1.60	0.95	
Factor 6	**Natural content**	**2.22[cd]**	**0.85**	**0.745**
	Is low in sulphur	2.51	1.10	
	Is produced using organic farming practices	2.15	1.04	
	Is produced using biodynamic farming practices	2.01	1.00	

Table 7 continued

Factor				
7	**Price**	**2.67[b]**	**0.71**	**0.708**
	Is good value for money	3.34	0.81	
	Is not expensive	2.61	0.94	
	Is cheap	2.04	0.92	
	Is highly priced	1.51	0.77	
Factor				
8	**Familiarity**	**2.16[d]**	**0.69**	**0.809**
	Is a familiar style	2.33	0.95	
	Is what I usually drink	2.31	1.01	
	Is a familiar cultivar	2.22	0.98	
	Is familiar	2.14	0.93	
	I have tasted before	1.98	0.96	
	Is a popular/well-known brand	1.96	0.93	
Factor				
9	**Ethical**	**2.84[a]**	**0.82**	**0.676**
	Is made in South Africa and supports the local economy	2.93	1.02	
	Is produced with ethical production methods	2.91	1.07	
	Is produced/ packaged in an environmentally friendly way	2.67	1.06	

The factors ranked in terms of importance (from highest overall mean score to lowest overall mean score) were the social, sensory appeal, ethical concern, which significantly differed from convenience, mood and price, which in turn differed significantly from and was followed by health, natural content, and familiarity. Overall the most important item scoring a mean of 3.92 was *'tastes good'* and the least important item scoring a mean of 1.09 was *'has won medals/awards'*. The factor ranking order also differed from that of the pre-test (Table 8). Price was 6th in the overall ranking, which is interesting as other studies have found price to be of higher importance (Ginon, Ares, Issanchou, Laboissière, & Deliza, 2014). Changing the question in the social factor for the pilot test also resulted in the factor achieving a higher mean and becoming the most important factor overall. This highlights how important phrasing of questions is, and how it can affect results. Interestingly the item '*could be served to guests*' scored a very high mean of 3.39, indicating that this item was very important to many of the participants. This aspect should be further investigated i.e. what makes a wine appropriate or inappropriate to serve to guests? Is this factor driven by product reputation, packaging, price or branding?

5.1 Relative importance of wine choice factors

When comparing the pre-test and pilot test, the order of the factors when ranked by importance changed (Table 8). The social factor which was the least important factor in the pre-test became the most important factor in the pilot study after changing the questions. Using less direct questions related to social status e.g. '*can be served to guests*' instead of '*makes me feel sophisticated*' resulted in an answer which was more in line with the observations from the focus groups in chapter 3, that wine is an important symbol of social status and sophistication. Sensory appeal and ethical concern which were the top two in the pre-test moved down to second and third place respectively. Familiarity moved from the middle of the set in the pre-test to the least important factor in the pilot test. Differences in the mean values for example the social factor which scored a mean of 1.62 in the pre-test and as opposed to 2.91 in the pilot (Table 8) were observed, and could be investigated further. However, it could be expected that the differing population sizes in the two tests could have an influence on the mean scores. These data show that the way specific questions are worded will have a major impact on how participants relate to the topic.

Table 8 Comparison of mean importance ranking of factors for the pre-test and pilot test. Alphabetical letters indicate significant differences between factors at a 95% confidence level.

		Pre-test					Pilot	
		Factor	**Mean**				**Factor**	**Mean**
Most important	1	Sensory	3.31	Most important		1	Social	2.91
	2	Ethical	2.52			2	Sensory	2.85
	3	Convenience	2.42			3	Ethical	2.84
	4	Price	2.39			4	Convenience	2.69
	5	Familiarity	2.22			5	Mood	2.69
	6	Mood	2.09			6	Price	2.67
	7	Health	1.90			7	Health	2.34
Least important	8	Natural	1.88	Least important		8	Natural	2.22
	9	Social	1.62			9	Familiarity	2.16

5.2 Analysis by demographic group

Ranking of factors, ANOVA and LS means analyses were compared by gender, ethnic group, generation, province, consumer involvement level, and consumer knowledge. Significant differences between the several factors were observed for the various groups.

5.2.1 Gender

The order of the first six factors was different for the males and females. The social factor was the most important factor for females, followed by ethical concern, sensory appeal, convenience, mood and then price (Table 9). Sensory appeal was the most important factor for the males followed by social, ethical concern, mood, price and convenience. Where they did not

differ in opinion was health, natural and familiarity in 7th, 8th and 9th position, deeming them the least important factors.

Table 9 Ranking of importance of motivational factors comparing males and females.

		Female			Male	
		Factor	Mean		Factor	Mean
Most important	1	Social	2.920	1	Sensory	2.935
	2	Ethical	2.862	2	Social	2.899
	3	Sensory	2.813	3	Ethical	2.788
	4	Convenience	2.803	4	Mood	2.656
	5	Mood	2.690	5	Price	2.650
	6	Price	2.673	6	Convenience	2.429
	7	Health	2.327	7	Health	2.362
	8	Natural	2.214	8	Natural	2.243
Least important	9	Familiarity	2.174	9	Familiarity	2.117
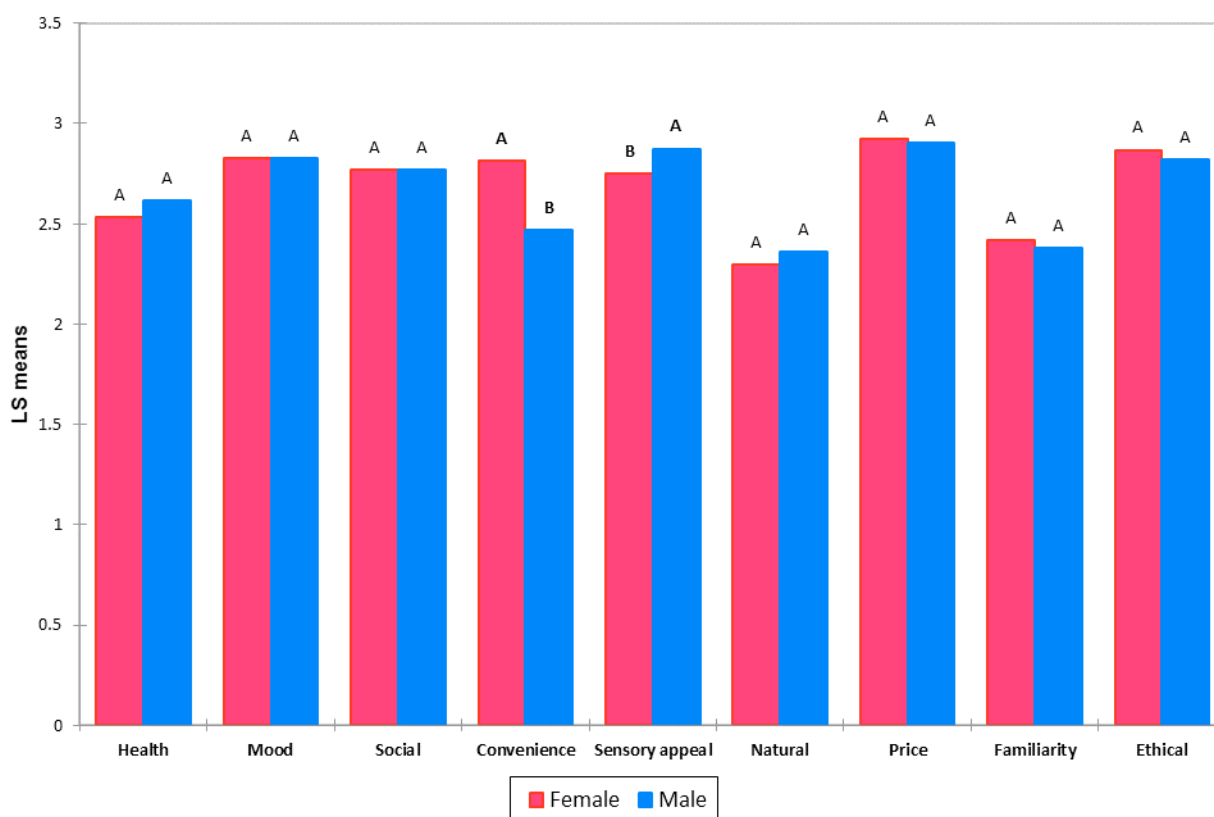
Figure 1 LS means for each factor compared by gender. Alphabetical letters indicate significant differences between factors at a 95% confidence level.

For the genders in this set of data, significant differences in factor scores were only observed for convenience and sensory appeal (Figure 1). Convenience was more important to females and sensory appeal was more important to males. Convenience being a more important factor for females makes sense, as it was noted in the focus groups of research Chapter 1 that female consumers purchase most wine while grocery shopping. Only finding a few differences between the genders somewhat contradicts what was found in chapter 1, where gender often drove the differences, however there are a few possible reasons for this result. Firstly, most of the participants were female, so if the population of males was increased differences may become

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significant. Secondly, wine perceptions differ and occasions for consumption differ, but it could be that when one decides to drink wine, the motivations are similar.

5.2.2 Ethnic group

Only the two ethnic groups with the largest populations were compared, Black and White. The ranking order for the importance of the factors differed completely for the black and white consumers (Table 10). For the black consumers, the social factor was the most important, followed by mood, ethical, convenience, sensory appeal, health, price, natural and familiarity. For the white consumers the most important factor was sensory appeal, followed by social, mood, price, ethical, convenience, familiarity, health and natural.

Table 10 Importance ranking of factors compared by ethnic group.

		Black			White	
		Factor	Mean		Factor	Mean
Most important	1	Social	3.257	1	Sensory appeal	2.883
	2	Mood	3.228	2	Social	2.817
	3	Ethical	3.096	3	Mood	2.709
	4	Convenience	3.056	4	Price	2.609
	5	Sensory appeal	2.971	5	Ethical	2.600
	6	Health	2.942	6	Convenience	2.545
	7	Price	2.833	7	Familiarity	2.075
	8	Natural	2.599	8	Health	2.046
Least important	9	Familiarity	2.446	9	Natural	1.919
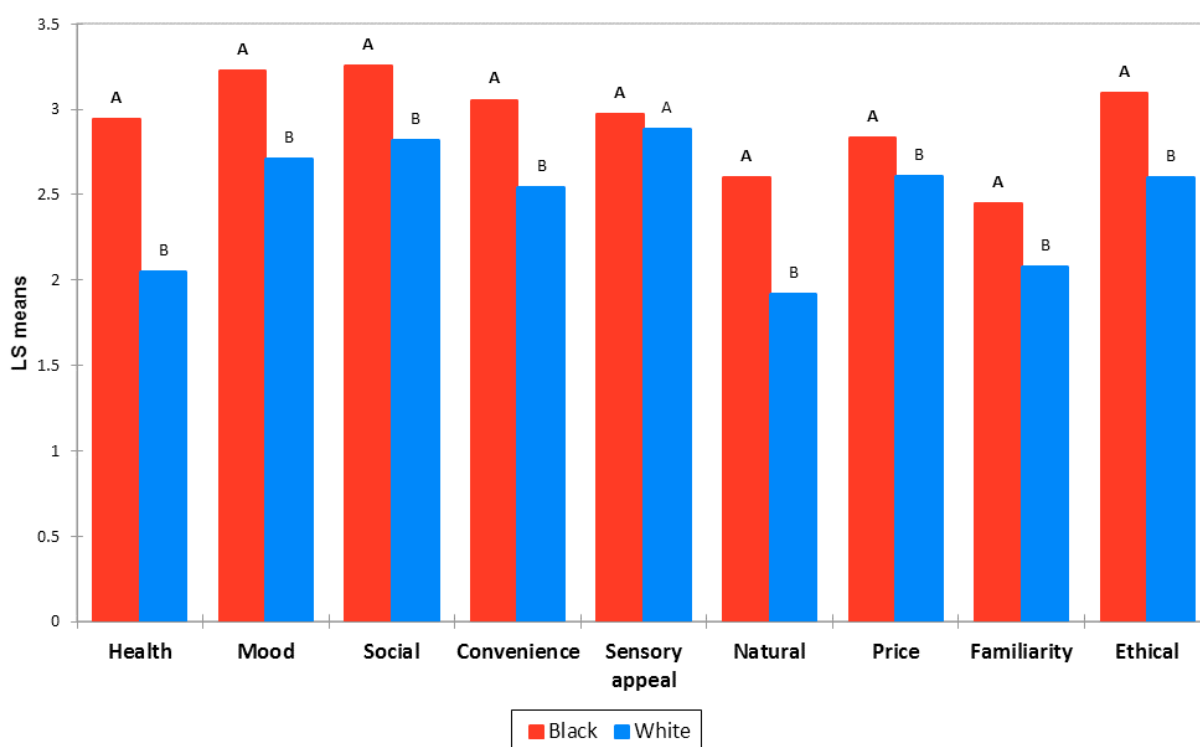
Figure 2 LS means for each factor compared by ethnic group. Alphabetical letters indicate significant differences between factors at a 95% confidence level.

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In Figure 2 we see that there is a significant difference between the white and black ethnic groups for 8 of the 9 factors, with those factors achieving a higher mean for the black consumer group. There was no significant difference in the average score for the sensory appeal factor between the two groups.

This result however could be related to the consumers use of the scale, given that all the factors received higher scores i.e. the black consumers may have simply rated everything higher.

5.2.3 Generation

Once again, the ranking order of the factors for Gen X and Gen Y differed (Table 11). Sensory was the most important factor for Gen X followed by social, ethical, convenience, price, mood, health, natural and familiarity as the least important factor. For Gen Y the most important factor was social, followed by mood, then sensory appeal, ethical, convenience, price, health, familiarity and natural as the least important factor.

Table 11 Importance ranking of factors compared by generation group.

|		Gen X			Gen Y	
		Factor	Mean		Factor	Mean
Most important	1	Sensory	2.963	1	Social	2.892
	2	Social	2.953	2	Mood	2.798
	3	Ethical	2.942	3	Sensory	2.783
	4	Convenience	2.691	4	Ethical	2.782
	5	Price	2.620	5	Convenience	2.696
	6	Mood	2.473	6	Price	2.692
	7	Health	2.424	7	Health	2.289
	8	Natural	2.341	8	Familiarity	2.160
Least important	9	Familiarity	2.152	9	Natural	2.155
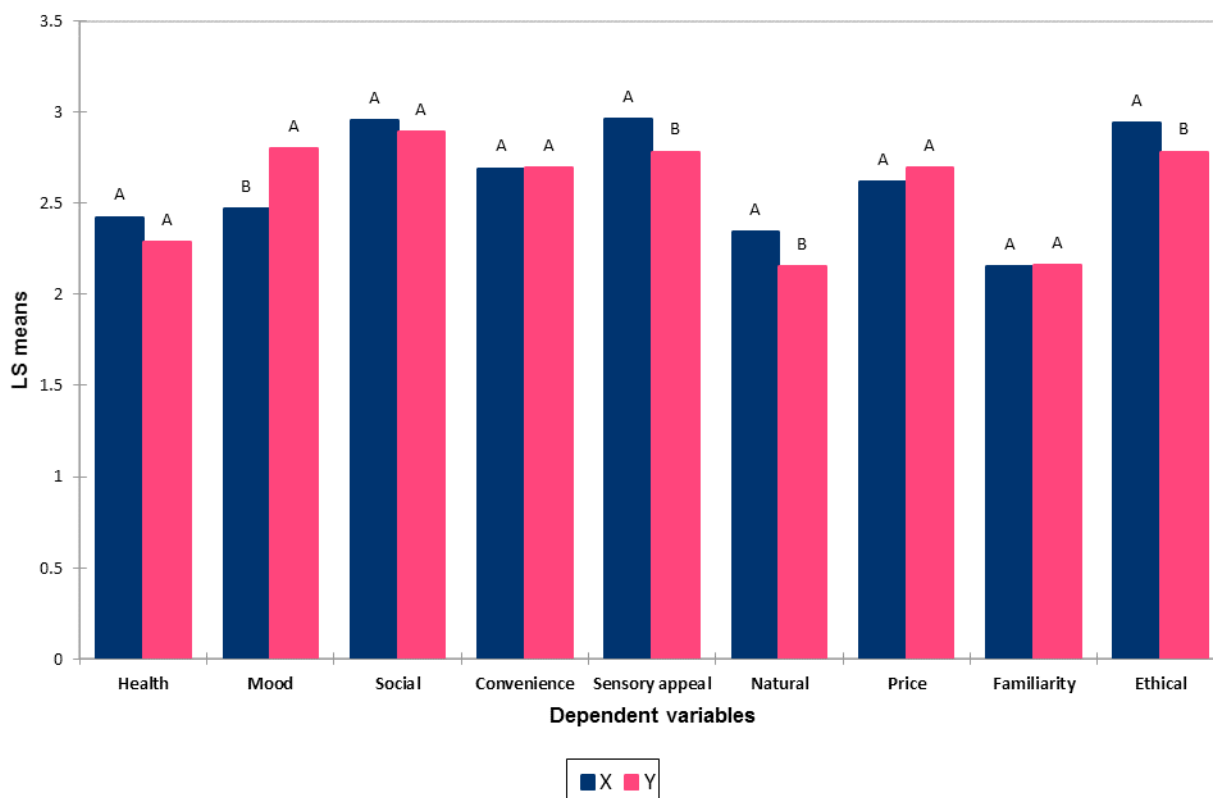
Figure 3 LS means for each factor compared by generation. Alphabetical letters indicate significant differences between factors at a 95% confidence level.

In Figure 3 one can see that, there were significant differences between the generations for the mood, sensory appeal, natural, and ethical factors. Mood was significantly more important to Gen Y consumers and ethical concern and sensory appeal were significantly more important to Gen X consumers.

5.2.4 Province

South Africa consists of nine different provinces, all with unique populations, climates, landscapes and economies (Brand South Africa, 2017). Of these nine, Gauteng and the Western Cape account for the majority of South Africa's wine consumption (South African Audience Research Foundation, 2014). These two provinces are however very different. Gauteng has a much higher population density and is the fast-paced economic hub of South Africa, and the Western cape is the wine growing region of the country and has a much more laid-back outdoors lifestyle (Brand South Africa, 2017). Due to these differences it was hypothesised that there would be differences in motivations for consumers from these two regions. The order of the first six factors differed between the two groups and can be seen in Table 12. For Gauteng, the most important factor was social, followed by ethical, sensory, convenience, mood and price. For the Western Cape, sensory appeal was the most important factor followed by social, ethical, price, mood and convenience. The groups agreed on the order of the 7th, 8th and 9th factors, health, natural and familiarity.

Table 12 Importance ranking of factors compared by province.

| | | Gauteng | | | Western Cape | |
		Factor	Mean		Factor	Mean
Most important	1	Social	2.970	1	Sensory appeal	2.909
	2	Ethical	2.898	2	Social	2.861
	3	Sensory appeal	2.817	3	Ethical	2.744
	4	Convenience	2.814	4	Price	2.653
	5	Mood	2.732	5	Mood	2.590
	6	Price	2.643	6	Convenience	2.496
	7	Health	2.490	7	Health	2.149
	8	Natural	2.319	8	Natural	2.081
Least important	9	Familiarity	2.250	9	Familiarity	2.013

Figure 4 LS means for each factor compared province. Alphabetical letters indicate significant differences between factors at a 95% confidence level.
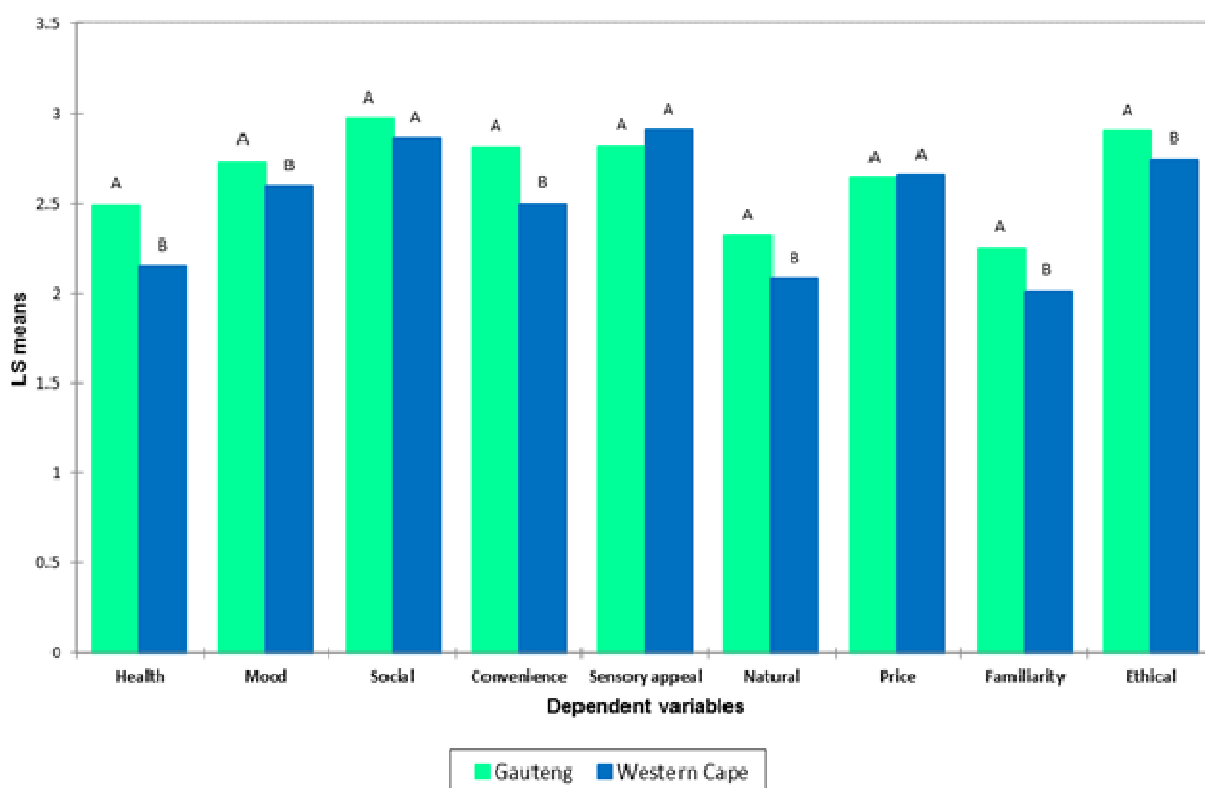
When the two provinces were compared in Figure 4 results showed significant differences for the health, mood, convenience, natural content, familiarity, and ethical factors. Most factors scored higher means for Gauteng population. Although familiarity was ranked as the least important factor for Gauteng consumers, it received a higher mean score than for Western Cape consumers, indicating that it is significantly more important to Gauteng consumers. Given that Gauteng is not a wine growing region, and these consumers do not have as much opportunity (when compared to Western Cape residents) to visit wine farms and taste different wines, it is therefore understandable that they may be less adventurous with their wine consumption and

rely more on familiarity and convenience. Health being less important to Western cape consumers makes sense as they generally live lower stress, active, outdoors "healthier" lifestyles when compared to Gauteng consumers. Interestingly to Gauteng consumers ethical concern was significantly more important than it was to Western cape consumers.

5.2.5 Involvement

Regardless of involvement level, the social factor was ranked as the most important (Table 13). Again health, natural, and familiarity were the least important factors in 7th, 8th and 9th position. For low involvement social was followed by ethical, sensory convenience, mood, and price. For the medium involvement consumers, the social factor was followed by sensory, ethical, price, convenience, and mood. For high involvement social was followed by ethical, sensory, mood, convenience, and price.

Table 13 Importance ranking of factors compared by level of involvement.

		Low involvement			Medium involvement			High involvement	
		Factor	Mean		Factor	Mean		Factor	Mean
Most important	1	Social	2.915	1	Social	2.983	1	Social	2.842
	2	Ethical	2.838	2	Sensory	2.906	2	Ethical	2.840
	3	Sensory	2.829	3	Ethical	2.843	3	Sensory	2.809
	4	Convenience	2.756	4	Price	2.664	4	Mood	2.757
	5	Mood	2.671	5	Convenience	2.621	5	Convenience	2.704
	6	Price	2.660	6	Mood	2.616	6	Price	2.675
	7	Health	2.355	7	Health	2.338	7	Health	2.319
Least important	8	Natural	2.252	8	Natural	2.204	8	Familiarity	2.223
	9	Familiarity	2.077	9	Familiarity	2.176	9	Natural	2.209
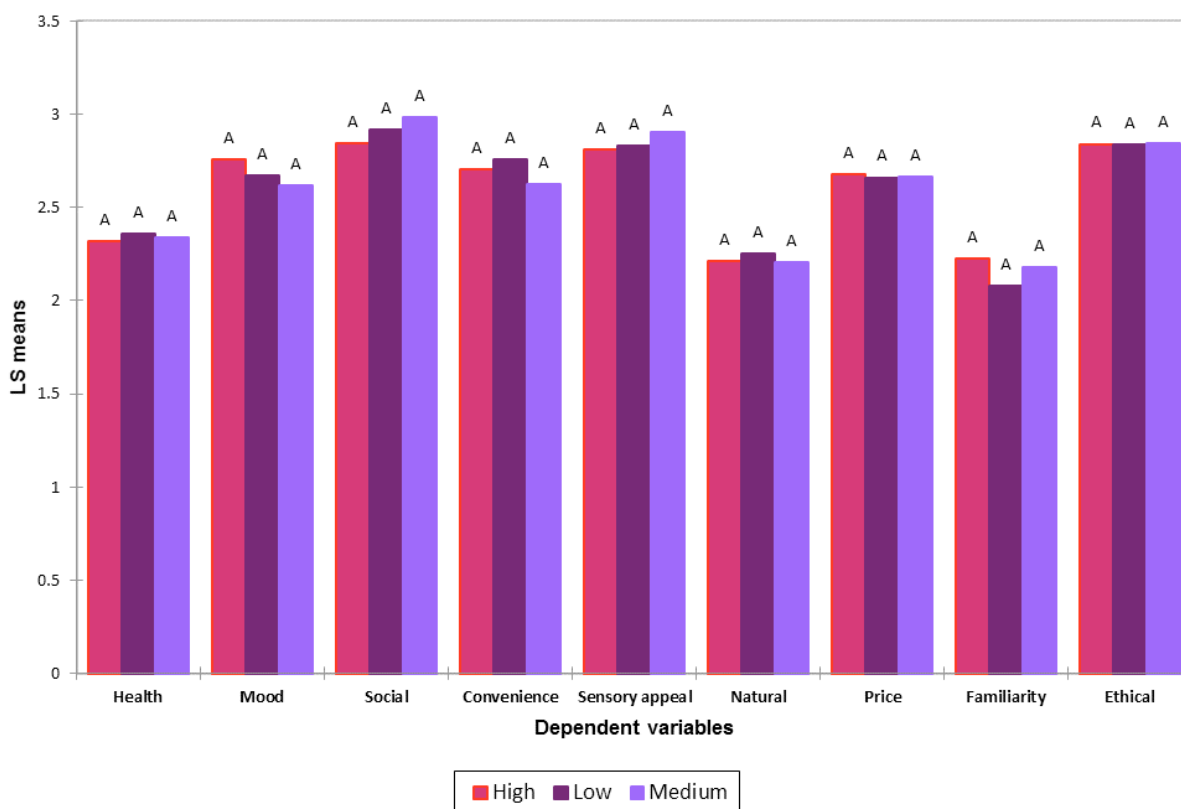
Figure 5 LS means for each factor are compared by consumer involvement. Alphabetical letters indicate significant differences between factors at a 95% confidence level.

There were however, no significant differences observed between the groups for any of the factors (Figure 5). Consumers motivation did not seem to be significantly affected by their level of involvement, as there were no significant differences observed for any of the factors.

5.2.6 Knowledge

The general order of the factors differed greatly between the different knowledge levels (Table 14). Sensory appeal was the most important factor for the very knowledgeable and connoisseur groups. Social was the most important factor for the somewhat knowledgeable group and ethical was the most important factor for the novice group. Familiarity was the least important factor for the novice and somewhat knowledgeable groups. Natural was the least important factor for the very knowledgeable and connoisseur groups.

Table 14 Importance ranking of factors compared by knowledge level.

|	Novice		Somewhat Knowledgeable		Very Knowledgeable		Connoisseur	
	Factor	Mean	Factor	Mean	Factor	Mean	Factor	Mean
Most	Ethical	2.809	Social	2.940	Sensory	3.147	Sensory	3.338
Important	Price	2.806	Ethical	2.877	Social	3.023	Social	2.950
	Convenience	2.804	Sensory	2.850	Ethical	2.828	Mood	2.712
	Social	2.747	Convenience	2.753	Mood	2.793	Ethical	2.517
	Mood	2.550	Mood	2.690	Convenience	2.563	Price	2.183
	Sensory	2.504	Price	2.687	Price	2.531	Health	1.867
	Health	2.305	Health	2.387	Health	2.315	Convenience	1.750
Least	Natural	2.220	Natural	2.261	Familiarity	2.227	Familiarity	1.608
Important	Familiarity	2.065	Familiarity	2.202	Natural	2.219	Natural	1.583

Figure 6 LS means for each factor are compared by consumer knowledge. Alphabetical letters indicate significant differences between factors at a 95% confidence level.
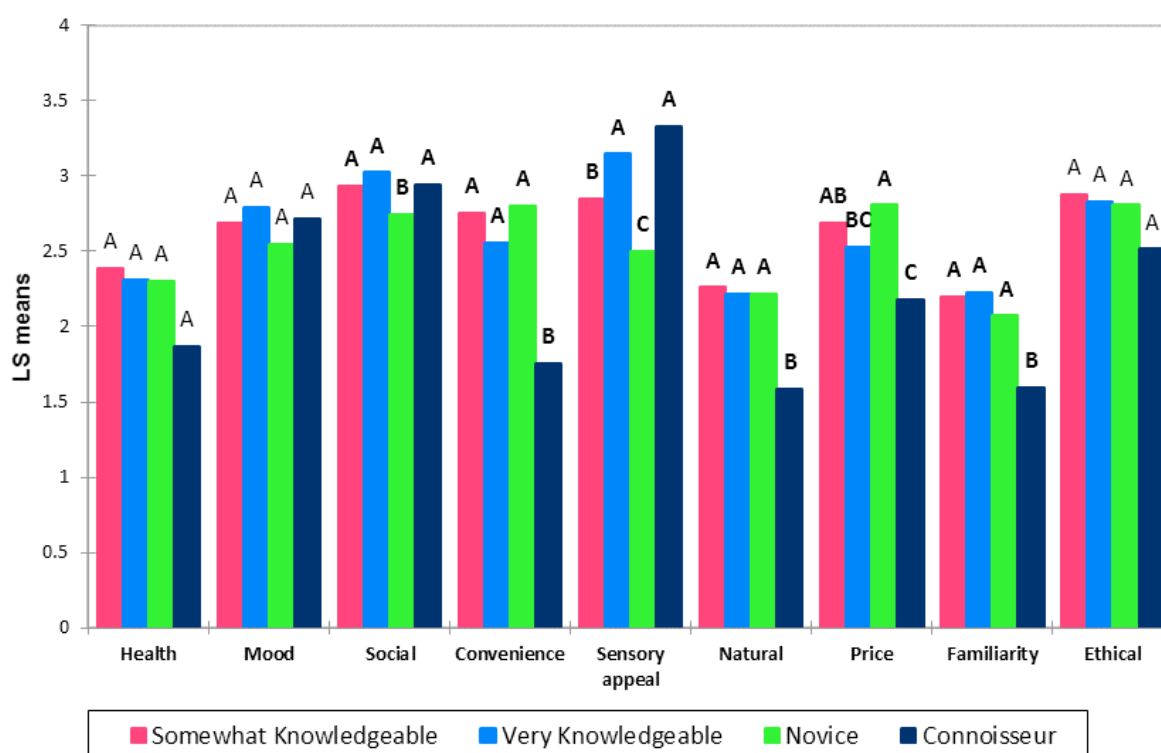
Knowledge seems to affect motivation significantly, as six of the nine factors showed significant differences (Figure 6). The social aspects were of less importance to novice consumers. Convenience is of less importance to consumers who consider themselves connoisseurs. Sensory appeal was most important to connoisseurs and significantly less important to novice consumers. Natural content was interestingly of little importance to connoisseurs, this could for example be because they may know that sulphur in wine does not cause headaches and may therefore have marked the item sulphur content as "*not at all important*". As has been previously found (Jaeger, Danaher, & Brodie, 2009), price was most important to novice consumers and least important to those consumers who considered themselves connoisseurs. Familiarity was

also of little importance to connoisseurs, understandably so, as connoisseurs are more likely to be more adventurous and able use their wine knowledge to make "educated" decisions.

6. Conclusion

Interesting potential trends emerged from the data which need to be confirmed and explored further. In the pre-test, it was observed that social status was the least important factor when it comes to motivation for wine consumption, however the questions in the second version of the questionnaire used in the pilot study better defined the social factor. This shows that how questions are phrased is very important in this kind of study, in some cases asking a direct question does not generate accurate answers.

The results of this study showed that the importance of the factors differs for different consumer segments. However, overall the social, sensory appeal and ethical concern were the top three motivational factors for South African consumers when it comes to wine consumption. This to some extent confirms the findings of the focus groups, where the importance of social aspects of wine were identified. Given that sensory appeal is also clearly an important motivation for consumers, further research on consumers' sensory perception of wine is recommended. The importance of the ethical factor could be attributed to South Africa's historical ethical problems in the wine industry with regards to labour, or simply to global trend of consumers heightened awareness which has been referred to in the media as "the rise of the conscious consumer" (Baker, 2015).

This was a pilot study, and the wine choice questionnaire is not complete, however the results of this study suggest that there is definite potential for the wine choice questionnaire and its use as a tool for investigating consumer's motivations for wine consumption. It will require further adaption and suggestions for future studies include testing a five or seven-point scale, which may help to better differentiate between some of the factors. The questions/items under the social, and convenience factors could also be expanded or further adapted to help better define these factors. With a scale such as the importance one used in this study, it is impossible to tell if participants paid attention to the questionnaire or filled it in haphazardly. Best worst scaling was considered to help eliminate this, but there were too many questions and the resultant questionnaire would have become tedious for consumers to fill out. However, the results of this study could potentially be used to develop a shorter condensed list of questions which could be tested using best worst scaling.

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Chapter 5

Consumers', trained assessors', and wine professionals' sensory perceptions of a set of dry white wines

Chapter 5: Consumers', trained assessors', and wine professionals' sensory perceptions of a set of dry white wines

Abstract

Sensory appeal is one of the most important motivations for consumption. However research has shown that consumers struggle to describe the sensory characteristics of wine. Sensory profiling of wine is usually done by industry professional or using descriptive analysis with trained assessors. In both cases the responsible parties underwent some form of training. But do consumers, who are untrained, understand these descriptions and perceive the wines in the same way? The aim of this study was therefore to compare wine professionals, trained assessors, and consumers' sensory perceptions of a set of South African white wines. As well as to investigate the role of cultivar/varietal name on consumers sensory perception, and overall acceptance of the wines. A set of seven dry white wines, including wooded and unwooded samples of Chardonnay, Chenin blanc and Sauvignon blanc was used. Descriptive analysis with trained assessors, and free description with wine professionals was done under blind conditions. CATA and overall liking was done with consumers under blind and informed conditions. The results revealed that both consumers, professionals and trained assessors had very similar perceptions of the wines. The calculated Rv coefficients indicated good consensus between the panels. As was expected the descriptive analysis generated most detailed descriptions of the wines, but industry professionals were better able to discriminate between the wines. Overall the separation was driven by the wood and green characteristics. The liking and consumers sensory descriptions did not differ significantly between the blind and informed conditions. Knowing the cultivar name did not significantly affect consumer liking scores of the wines. Consumers although untrained, perceive the sensory properties of wine in a similar way to trained individuals. Cultivar is one of the least important extrinsic cues.

1. Introduction

Although extrinsic factors play an important role in consumer perceptions and purchasing, studies have found, including the results of research chapter 4, that sensory appeal (i.e. intrinsic factors) is still one the most important driving factors/motivations for consumption (Eertmans, Victoir, Notelaers, Vansant, & Van den Bergh, 2006; Steptoe, Pollard, & Wardle, 1995; Vabø & Hansen, 2014) . This is especially true in the case of wine, which is a luxury item, consumed for pleasure (Ferrarini et al., 2010), consumers will not drink if it does not appeal to their senses.

Research has however shown that consumers struggle to describe sensory characteristics of wine (Bruwer, 2014; Pettigrew & Charters, 2008). In Research Chapter 3 it was also observed that consumers showed difficulty describing white wine. When white wine was mentioned consumers made specific reference to two cultivars namely Sauvignon blanc and Chardonnay. Consumers also seemed to have specific associations for Sauvignon blanc having 'fruity' characteristics, and Chardonnay having 'oaky' characteristics.

Sensory profiling is an integral part of the product development process. In the wine industry this profiling is normally done by wine professionals in an empirical fashion, and in a few cases wine may be subjected to descriptive analysis (DA) using a trained panel. DA uses a trained panel of assessors to describe and highlight similarities and differences in the aroma, taste, appearance, and mouthfeel of samples (Lawless & Heymann, 2010). Whether professionals or DA are used, the persons profiling the wines, have undergone some form of training. These descriptions are then used to communicate with consumers in various ways be it through the tasting notes available on websites, descriptions given by tasting room staff, or the back labels of bottles. The question must therefore be asked, do consumers who are untrained, understand these descriptions and perceive the wines in the same way?

The application of alternative sensory methodology using consumer descriptions has become popular, with the advantage of obtaining descriptions straight from consumers. Check-all-that-apply is an established method for sensory characterization often performed with consumers (Ares, Tárrega, Izquierdo, & Jaeger, 2014; Jaeger et al., 2015; Lezaeta, Bordeu, Naes, & Varela, 2017). It makes use of a list of attributes predetermined by the researcher, and it may include sensory, emotional or hedonic terminology (Ng, Chaya, & Hort, 2013). Predicting actual consumer preferences using hedonic liking alone is limited as it does not take consumers feelings and motivations into account. Research has shown that emotional descriptions could aid in differentiating between products which were liked similarly, (Danner, Johnson, Ristic, Meiselman, & Bastian, 2017; Ferrarini et al., 2010; S. C. King & Meiselman, 2009) and is a better predictor of preference than liking alone (Dalenberg et al., 2014).

The first objective of this study was therefore to investigate whether the descriptions of a set of white wines by industry professionals and the trained panel differ, and to see whether consumers who were given a CATA list based on the trained panel and professional panel's descriptors were able to describe the same set of wines in a similar way. In other words, do consumers understand and interpret the sensory components of the wine in the same way that trained panels and professionals do. The second objective of this study, focussed on the

consumers and investigated liking, and more specifically whether cultivar name influenced the liking and the way consumers describe wines.

2. Materials and Methods

2.1 Samples

The wines for this study were donated by a wine producer and were all commercially available, affordable (ranging from R60 - R100) and produced in the Western Cape. The set was made up of seven white wines consisting of three Chardonnay, two Chenin blanc and two Sauvignon blanc. These cultivars were chosen as they are the top three white cultivars in South Africa by sales (and production) (SAWIS, 2016). The set consisted of both wooded and unwooded styles. All the wines were classified as dry white wines and there were no significant perceivable differences between the sugar and acid contents of the wine. The descriptions of the wines can be seen in Table 1. The wines used were analysed using Fourier transform mid-infrared spectroscopy (WineScan Instrument, Foss Analytical, HillerØd, Denmark), using the PLS calibration models as described by Nieuwoudt et al. (2004). All three panels tasted the same set of seven wines.

Table 1 Description of the wines used in this study.

Wine Sample	Cultivar	Vintage	Style	Total sugar (g/L)	Titratable acidity (g/L)	Malic acid (g/L)	pH	Ethanol (% v/v)	Glycerol (g/L)
UnSB	Sauvignon blanc	2016	Unwooded	3.74	6.28	2.20	3.26	13.40	6.62
WSB	Sauvignon blanc	2015	Wooded	2.48	6.69	2.72	3.15	13.48	6.88
UnCH	Chardonnay	2016	Unwooded	3.04	6.07	2.20	3.28	13.32	6.47
SWCH	Chardonnay	2016	Wooded	3.51	6.19	3.01	3.51	13.34	7.30
WCH	Chardonnay	2015	Wooded	3.07	6.32	0.63	3.44	14.76	7.83
UnCB	Chenin blanc	2016	Unwooded	3.75	5.81	2.44	3.33	12.97	6.73
WCB	Chenin blanc	2015	Wooded	4.45	6.27	0.46	3.41	13.79	8.26

2.2 Descriptive analysis (DA) with trained assessors

The method descriptive analysis was chosen, as it is the most widely used method in the food and beverage industry making use of a trained panel for product characterisation (Lawless & Heymann, 2010).

2.2.1 Panel

For the purposes of this study a trained assessor "is someone with a high degree of sensory acuity, who has the ability to make consistent and repeatable sensory assessments and is part of a sensory panel" (Lesschaeve, 2007). The descriptive analysis panel employed by the Department of Viticulture and Oenology, Stellenbosch University was used. The panel consisted of 9 females ranging in age from 25 to 60, with an average age of 40. The panel had extensive experience in descriptive sensory analysis of wine, and were remunerated for their services as sensory panellists.

2.2.2 Training

The panel attended 10 two-hour training sessions, where they were trained using the consensus descriptive analysis method (Lawless & Heymann, 2010). During the first two training sessions, the panel generated terms to describe the aroma, taste, and mouthfeel of the set of wines. The panel were also provided with solutions representing the basic tastes (sweet, sour, bitter and astringency) at different concentrations which they were required to taste, identify, and rank. In training sessions 3 and 4 the panel was presented with standards for the attributes they had identified, and were required to smell and identify them. The panel reached consensus on a list of 26 aroma and taste attributes (Table 2). The final training sessions, were for the panel to reach consensus on the intensity ratings for each attribute, and to familiarise themselves with how to mark it on the 10cm unstructured line scale.

Table 2 Descriptors generated during descriptive analysis.

Category	Attribute	Odour reference	Quantity/Concentration
Aroma	Floral	Blütensirup Holunderblüte Elderflower syrup	15 mL
	Tomato leaf	Fresh tomato leaves	5 units
	Passion fruit	Fresh pulp	1 tsp
	Buttery	Fresh Lurpak	1tsp
	Marmalade	Hilcrest Seville orange marmalade	1tsp
	Grapefruit	Le Nez Du Vin – Jean Lenoir (54)	
	Honey	Le Nez Du Vin – Jean Lenoir (54)	
	Caramel	Le Nez Du Vin – Jean Lenoir (54)	
	Oak	Le Nez Du Vin – New Oak	
	Guava	Darling guava juice	25 mL
	Green pepper	Fresh	10 g
	Dried fruit	Safari mixed dried fruit (prune, peach, apricot, apple)	1 unit of each
	Banana	Fresh	1 cm slice
	Asparagus	Gemz white asparagus spears ½	1 spear

Table 2 continued

	Pineapple	Rhodes canned pineapple	2-1 cm^3
	Peach	Ceres peach juice	25 mL
	Baked apple	Fresh apple - baked	2-1 cm^3
	Dill	Fresh dill	1 stem chopped
Taste	Sweet	Fructose	5 g/L in water
	Sour	Tartaric acid	0.5 g/L in water
	Bitter	Quinine	0.03g/L in water
Mouthfeel	Astringent	Alum	1 g/L in water
	Body	5% Carboxymethyl cellulose	1.5g/L in water

2.2.3 Wine evaluation

The evaluation was conducted in the Sensory laboratory at Stellenbosch University's Department of Viticulture and Oenology which is a temperature and light controlled environment. The evaluation of the wines was done in triplicate. The panel sat in individual booths and were presented with 20 mL samples of the wines in a randomised order, in black ISO tasting glasses marked with unique three-digit codes. They were asked to evaluate the samples in the presented order from left to right, and rate the intensity on a 10cm line scale anchored on the left-hand side by '*none*' and on the right-hand side by '*intense*'. Ratings were captured in Compusense® Five (Compusense Inc., Guelph, Canada).

A 1 g/L pectin (Sigma Aldrich) solution was used as a palate cleanser (Vidal, Antúnez, Giménez, & Ares, 2016). Panellists were instructed to expectorate each sample and cleanse their pallets between samples by rinsing with the pectin solution.

2.2.4 Data Analysis

The DA made use of a randomised complete block design (Lawless & Heymann, 2010), and the workflow as described by Tomic et al. (2010) was followed. The intensity data generated by the panel was exported from Compusense® Five (Compusense Inc., Guelph, Canada) and analysed using PanelCheck® software ver. 1.4.0, (Nofima, Norway). The p/MSE plots and Multi-block PCA (Tucker) plots were analysed in order to access panel consistency and repeatability.

The data was subject to two-way, mixed model ANOVA, where the sample was the fixed factor and assessors were the random factor. Differences between the wines were further investigated by performing principal component analysis (PCA) on the correlations matrix of the significant attributes using R software v. 3.4.1 and Statistica 13.0 (StatSoft, 2017). The PCA model was computed on the average score of each significant attribute ($p \leq 0.5$) identified in the ANOVA.

Bootstrapping was also used to establish product confidence intervals (Dehlholm, Brockhoff, & Bredie, 2012).

2.3 Free Description with industry professionals

Free description method was chosen for use with the experts as this method is most similar to the type of tastings that the chosen professionals do on a daily basis.

2.3.1 Panel

For the purposes of this study a wine professional is defined as "someone who has extensive experience in a product category, and is able to perform evaluations or draw conclusions on effects of raw materials, processing, storage, ageing" (Lesschaeve, 2007) in this case, either winemakers or sommeliers. A group of 30 wine industry professionals (winemakers and sommeliers) were recruited. The panel consisted of 14 females and 16 males with an age range of 26 to 61, with an average age of 44.

2.3.2 Wine Evaluation

It has been shown that professionals are more easily able to distinguish between wines, and often this ability is linked to their knowledge rather than sensory acuity (Lesschaeve, 2007; Parr, White, & Heatherbell, 2004). For this reason the wines were presented in a randomised order, in black ISO glasses, labelled with unique three-digit codes. Testing took place in individual booths in a temperature controlled environment. The panel was instructed to taste the samples from left to right and describe in their own words the aroma, taste/mouthfeel of each sample. They were required to expectorate each sample and cleanse their pallets between samples by rinsing with pectin (Sigma Aldrich) solution with a concentration of 1 g/L. The evaluations were conducted in the Sensory lab at the Department of Viticulture and Oenology, which has individual booths in a light and temperature controlled environment. Responses were captured in Compusense® at hand (Compusense Inc., Guelph, Canada).

After completing the free description of the wines, the professionals were also asked for their opinion on what they think the main differences are between South African Chenin blanc, Chardonnay, and Sauvignon blanc.

2.3.3 Data Analysis

The free description data was cleaned up and transformed into a contingency table of the most cited terms. Terms cited by less than 15% of the panel were removed (Campo, Ballester, Langlois, Dacremont, & Valentin, 2010). Correspondence analysis with bootstrapping to calculate confidence ellipses, was conducted using R software v. 3.4.1. and Statistica 13.0

(StatSoft, 2017). Bootstrapping was used to establish product confidence intervals (Dehlholm et al., 2012).

2.4 Check-all-that-apply with consumers

CATA was the method of choice as it has been shown to be effective when done with consumers (Ares et al., 2015), and has been used successfully with wine in the past (Botha, 2015; Lezaeta et al., 2017). Another reason this method was chosen was because both sensory and emotional terms could be used (Ng et al., 2013).

2.4.1 Panel

Consumers were recruited based on their interest and availability during February 2017. In order to participate consumers had to be over 18 years of age (legal drinking age in South Africa). One hundred and forty-one participants took part in this study, of which 61% were female and 39% were male. Consumers ages ranged between 20 and 40. Participants were regular white wine consumers, who drank wine at least once a week.

This study received ethical approval by the ethics committee at the Stellenbosch University.

2.4.2 Wine Evaluation

Check-all-that-apply method was used with consumers. The CATA list was made up of two parts, the first was a list of aromas and the second was a list of emotions. In total there were 42 terms (Table 3), when working with wine aroma characterization, longer CATA lists are not encouraged as they are likely to induce fatigue with consumers and potentially negatively affect results (Campo et al., 2010; Campo, Do, Ferreira, & Valentin, 2008).The aroma and taste terms were compiled from the summary of terms elicited in the experts free description and the descriptive analysis. The emotional terms included the complete list of terms from the emo-sensory wheel (Schouteten et al., 2015), and other emotional terms that were frequently mentioned during the focus groups (Chapter three) such as "relaxed" were added.

The samples were presented in a randomised order, and labelled with unique three-digit codes. Testing took place in individual booths in a temperature controlled environment. There were two sessions. In the first session, consumers were instructed to smell and taste each sample in the given order, and fill in the sensory CATA lists, choosing a minimum of 3 descriptors. Consumers were then also asked to rate their liking of each sample on a nine-point hedonic scale ranging from dislike extremely to like extremely. A nine-point scale was chosen to help eliminate context effects. Consumers tend to stick to the middles of scale and not use the extreme end points, therefore the shorter the scale the more risk of having fewer differences in your data (Lim, 2011). The second session was a repeat of the first except in that the wines were labelled with

cultivar. The responses to all questions were captured using Compusense® at hand (Compusense Inc., Guelph, Canada).

Table 3 Terms used for the consumer CATA.

Sensory terms	Emotional terms
Off flavour	Pleasant surprise
Sweet	Pleasant
Sour/Acidic	Merry
Bitter	Happy
Smooth	Glad
Fruity	Energetic
Citrus	Contented
Tropical	Worried
Dried fruit	Fear
Ripe fruit	Distrust
Floral	Dissatisfied
Vanilla/Caramel	Disgust
Honey	Discontented
Cooked vegetables	Disappointed
Green/Herbaceous	Relaxed*
Buttery	Satisfied*
Woody/Oaky	Classy*
Spicy	Sophisticated*
Smoky	Comfortable*
Nutty	Refreshed*
Hay/Straw	
Mineral	

*Terms that were added and were not part of the existing list of 14 emotional terms in the EmoSensory® wheel (Schouteten et al., 2015).

2.4.3 Data Analysis

The CATA data was transformed into a contingency table, each term was used by at least 15% of the consumers, therefore none were removed (Campo et al., 2010). Cochrans Q test (Manoukian, 1986) was performed on each term from the CATA list in order to determine significant differences in frequency of term selection. Correspondence analysis was done on the contingency table of CATA frequencies for both the blind and informed results, and confidence ellipses were obtained by bootstrapping (Cadoret & Husson, 2013; Dehlholm et al., 2012). Rv co-efficients (Robert & Escoufier, 1976) were calculated to determine similarities between the sensory spaces of the first two dimensions of the CA plots, obtained between the blind and

informed tastings. The data analysis was done using R software v. 3.4.1 and Statistica 13.0 (StatSoft, 2017).

For the liking data two-way ANOVA with sample and gender as between-subject variables was done.

2.5 Comparison of results

Similarities of the sensory spaces generated by the descriptive analysis, free description and CATA were compared by calculating Rv coefficients using R software v. 3.4.1 and Statistica 13.0 (StatSoft, 2017). Rv coefficients are value measures of how similar factorial configurations are, and have been used to compare the similarity of sensory spaces between maps (Louw et al., 2013). Rv coefficients are independent of rotation and translation, and are calculated by the relative configuration of sample positions on the respective maps (Robert & Escoufier, 1976). Rv values range between 0 and 1, where 0 indicates no correlation between plots and 1 indicates that configurations are identical. In the literature Rv values for most sensory studies above 0.6 were acceptable (Ares et al., 2015; Lelièvre, Chollet, Abdi, & Valentin, 2008). For this study Rv coefficients were calculated between the results from the consumer, professional and trained panel results.

3. Results and Discussion

3.1 Descriptive analysis

Significant differences were found for 21 of the 23 measured sensory attributes (Table 4).

Table 4 Significance of Sensory attributes measured during descriptive analysis.

Sensory Attribute	*p* Value
Pineapple	0.00075
Passionfruit	0.0000
Guava	0.01063
Grapefruit	n.s*
Banana	0.00007
Peach	0.00002
Floral	0.00029
Baked apple	0.00187
Dried fruit	0.00065
Marmalade	0.00011
Honey	n.s*
Caramel	0.00002
Buttery	0.00098
Straw/Dust	0.04055
Oak	0.00000
Green pepper	0.00000
Asparagus	0.00000
Tomato leaf	0.00016
Dill	0.00000
Sweet	0.00500
Sour	0.00718
Bitter	0.01829
Body	0.00005
Astringency	n.s*

*ns - not significant, p-value larger than 0.05

Results of the descriptive analysis can be seen in Figure 1. The PCA plot includes average scores of replicates and assessors (Figure 1A). Eighty-three percent of the variance is explained by principal component 1 and 2, principal component 3 did not add any relevant information. The separation on the PC2 was driven by wood and the fruity, fresh wines separated from the richer wooded wines on PC1. Confidence ellipses confirm that the samples separate into 4 groups (Figure 1B).

The WCB and WCH (wooden Chenin blanc and wooded Chardonnay) were very similar to one another, and strongly correlated with oak and sweet associated aromas such as caramel and marmalade. Although the SWCH did have barrel contact, this did not come out in the sensory profiling as oak was not associated with this sample. SWCH, UnCH and UnCB grouped together and were more positively correlated to dried fruit, baked apple, floral, peach and sweet taste. The Unwooded Sauvignon blanc was positively correlated to the tropical fruit aromas of

pineapple, guava, passion fruit and grapefruit. WSB was in a group on its own and was positively correlated with green and herbaceous aromas.
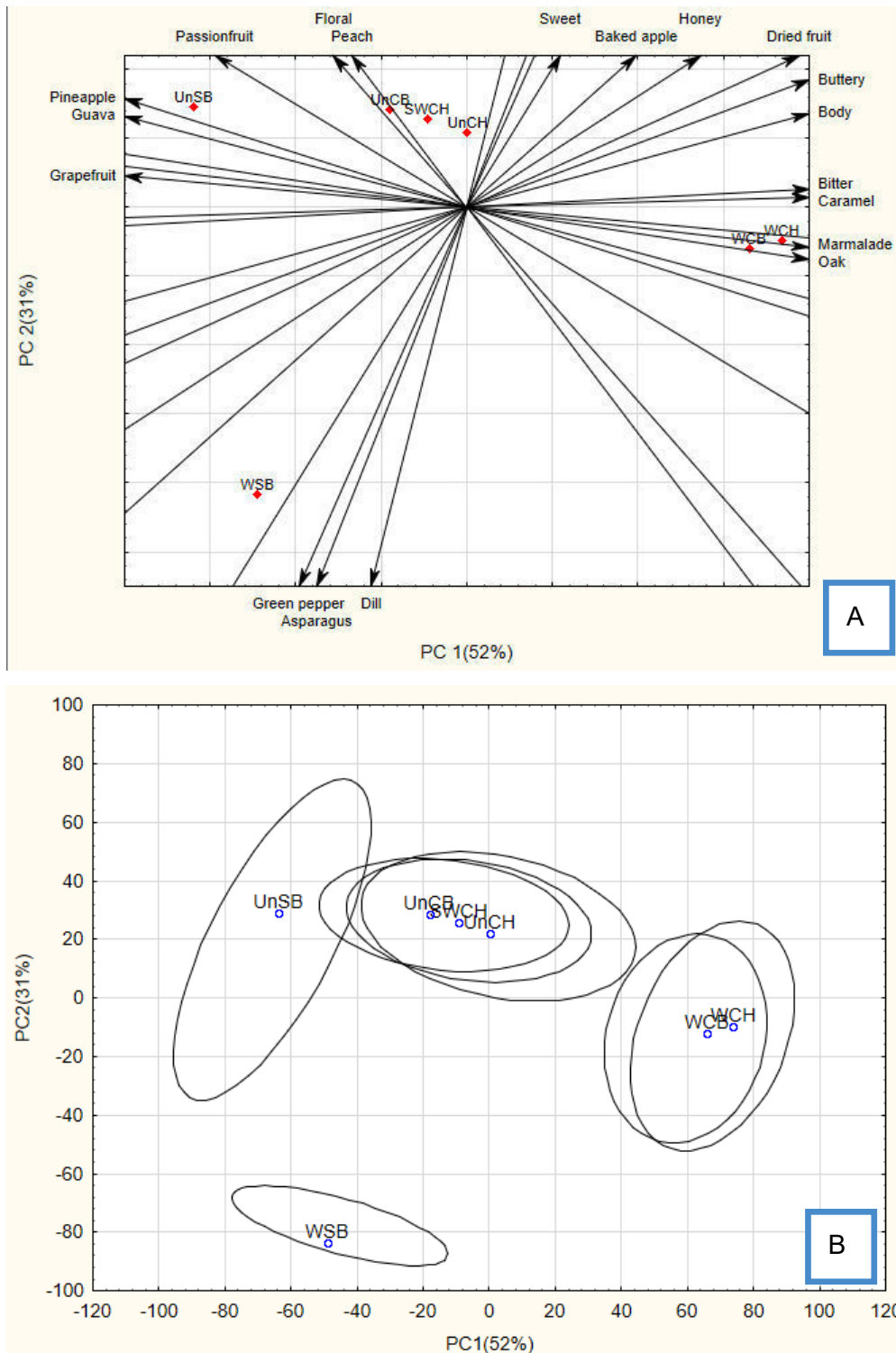

Figure 1 Representation of the first two dimensions of the principal component analysis of the descriptive analysis (A) showing both the samples and the terms used to describe them (B) showing the samples and the confidence elipses.

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3.2 Free description

The first two dimensions of the CA plot explain 78.9% of the variance in the data (Figure 2). The third and fourth dimensions did not provide relevant information. Samples were mapped according to their aroma and taste descriptions.
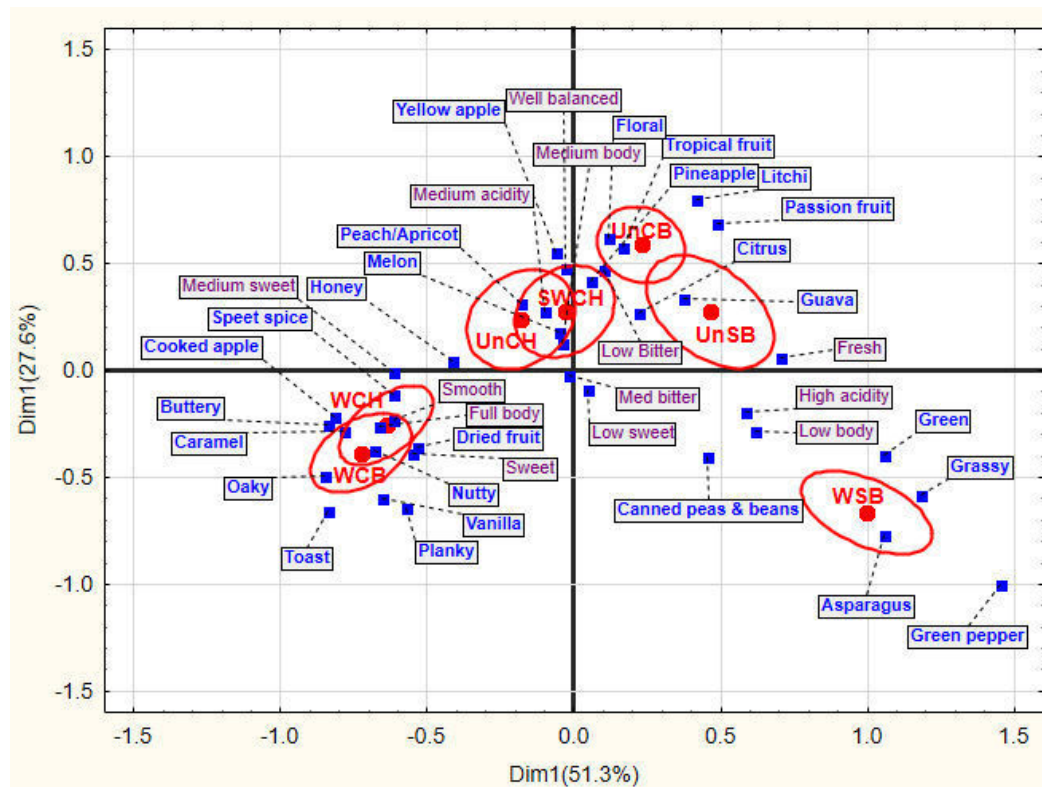
Figure 2 Representation of the first two dimensions of the correspondence analysis of the data from the professional descriptions of the wine samples, showing both the samples and the terms used to describe them. Circles represent confidence elipses.

Sample WSB was placed in the positive quadrant of the first and second dimensions, and was described by the sensory terms Green, Asparagus, Canned peas & beans, Grassy, Green pepper, High acidity, Low body. Samples WCB and WCH were placed in the negative quadrant of dimension one and two, and were described as Oaky, Planky, Toast, Vanilla, Caramel, Cooked apple, Dried fruit, Buttery, sweet and higher in body. UnCH, SWCH, UnCB, and UnSB were on the positive side of PC2, and were characterised by mostly tropical, fruity and floral aromas. Looking at the confidence ellipses, there are two definite groups, the first is WSB on its own and the second is WCH and WCB together. For the third group there is overlap between UnCH and SWCH, and then the fourth group, there is a slight overlap between the UnCB and UnSB.

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The separation on dimension 2 was driven by wood aromas. Separation on dimension 1 is driven by tropical fresh on the positive side and cooked dried fruit on the negative side. For the professionals the WCH and WCB samples were perceived as sweeter.

3.3 Check-all-that-apply

In total for the blind consumer test, 27 of the attributes were significant and for the informed test only 22 were significant (Table 5). Interestingly bitterness, ripe fruit, merry, happy, glad, worried, fear, disgust, and disappointed were significant under blind conditions, but were no longer significant under informed conditions. Contrastingly, smooth, nutty, mineral and energetic were not significant under blind conditions but became significant under informed conditions. This could be due to the fact that in the first tasting the wines were not labelled and consumers had to rely on their perceptions as there were no extrinsic cues to assist them. In the second tasting however, the wines were labelled with their cultivar so consumers were given an extrinsic attribute which could have triggered preconceived ideas or personal feelings towards some cultivars, which may have changed the way the wines were described.

Table 5 Significant attributes for the blind and informed consumer test.

Attribute	Blind			Informed		
	Q-statistic	Df	p value	Q-statistic	Df	p value
Off flavour	7.67	6	0.26	8.80	6	0.19
Sweet	**34.80**	**6**	**0.00**	**21.53**	**6**	**0.00**
Sour/Acidic	11.16	6	0.08	8.16	6	0.23
Bitter	**14.62**	**6**	**0.02**	10.76	6	0.10
Smooth	11.53	6	0.07	**15.53**	**6**	**0.02**
Peach/Apricot	**21.74**	**6**	**0.00**	**48.07**	**6**	**0.00**
Citrus fruit	**29.55**	**6**	**0.00**	**28.45**	**6**	**0.00**
Tropical fruit	**45.82**	**6**	**0.00**	**76.56**	**6**	**0.00**
Dried fruit	5.03	6	0.54	7.18	6	0.30
Ripe fruit	**14.30**	**6**	**0.03**	7.68	6	0.26
Floral	**45.06**	**6**	**0.00**	**44.66**	**6**	**0.00**
Vanilla/Caramel	**40.38**	**6**	**0.00**	**51.68**	**6**	**0.00**
Honey	**26.90**	**6**	**0.00**	**21.94**	**6**	**0.00**
Cooked vegetables	**51.77**	**6**	**0.00**	**38.03**	**6**	**0.00**
Green/ Herbaceous	**55.43**	**6**	**0.00**	**79.06**	**6**	**0.00**
Buttery	**46.37**	**6**	**0.00**	**62.06**	**6**	**0.00**
Woody/oaky	**137.86**	**6**	**0.00**	**123.02**	**6**	**0.00**
Spicy	**15.95**	**6**	**0.01**	**23.53**	**6**	**0.00**

Table 5 continued.

| Attribute	Blind			Informed		
	Q-statistic	Df	*p* value	Q-statistic	Df	*p* value
Smokey	**45.35**	**6**	**0.00**	**59.15**	**6**	**0.00**
Nutty	7.39	6	0.29	**22.34**	**6**	**0.00**
Hay/Straw	**14.18**	**6**	**0.03**	**23.63**	**6**	**0.00**
Mineral	10.20	6	0.12	**19.29**	**6**	**0.00**
Pleasant surprise	6.86	6	0.33	7.87	6	0.25
Pleasant	**16.71**	**6**	**0.01**	**12.90**	**6**	**0.04**
Merry	**14.58**	**6**	**0.02**	9.24	6	0.16
Happy	**18.09**	**6**	**0.01**	10.39	6	0.11
Glad	**12.62**	**6**	**0.05**	10.00	6	0.12
Energetic	11.01	6	0.09	**15.85**	**6**	**0.01**
Contented	4.05	6	0.67	5.68	6	0.46
Worried	**25.96**	**6**	**0.00**	8.32	6	0.22
Fear	**20.54**	**6**	**0.00**	7.69	6	0.26
Distrust	**18.99**	**6**	**0.00**	10.52	6	0.10
Dissatisfied	**30.99**	**6**	**0.00**	**22.66**	**6**	**0.00**
Disgust	**23.38**	**6**	**0.00**	**21.55**	**6**	**0.00**
Discontented	9.04	6	0.17	8.78	6	0.19
Disappointed	**34.29**	**6**	**0.00**	12.23	6	0.06
Relaxed	3.47	6	0.75	4.64	6	0.59
Satisfied	10.93	6	0.09	6.98	6	0.32
Classy	11.82	6	0.07	3.30	6	0.77
Sophisticated	12.11	6	0.06	5.57	6	0.47
Comfortable	9.78	6	0.13	7.84	6	0.25
Refreshed	**22.74**	**6**	**0.00**	21.76	6	**0.00**
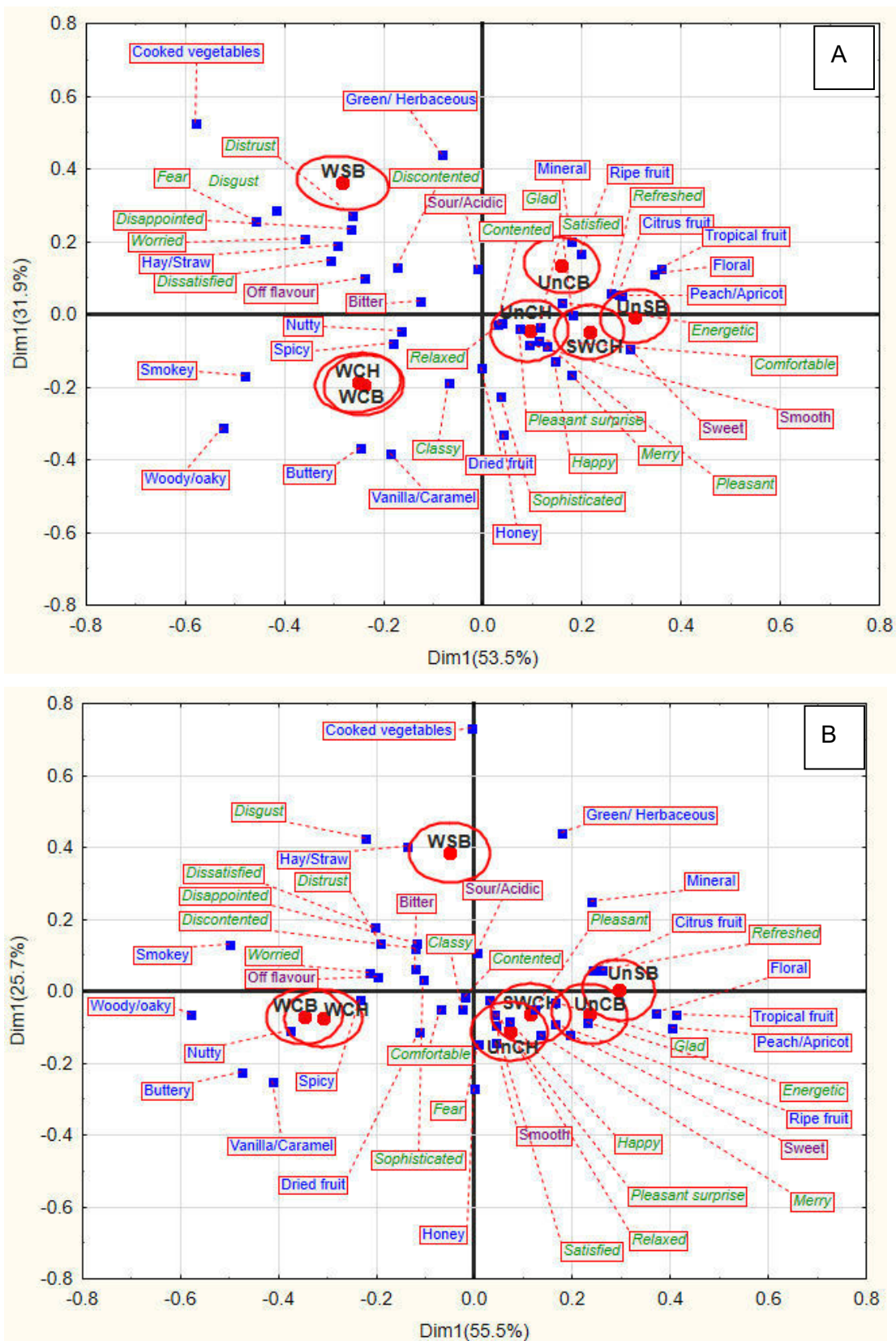
Figure 3 Correspondence analysis of the consumer CATA results **(**A) Blind (B) Informed

Figure 3A CA plot from the blind consumer CATA dimension 1 and 2, has an explained variance of 85.4%. Figure 3B CA plot from the informed consumer CATA dimension 1 and 2, has an explained variance of 81.2%. Separation on Dimension 1 seems to be driven by wood aromas.

The samples UnSB, UnCH, UnCB, SWCH, were perceived to be sweeter by the consumers. This differs from the professionals who perceived the WCH and WCB samples to be sweeter. It seems as though consumers perceive the very fruity wines to be sweet and the professionals perceive the wooded wines and their sweet associated aromas to be sweeter. This could be due to knowledge effect. Professionals know that wood contact can impart sweet associated caramel/vanilla/butterscotch attributes to wine, or perhaps consumers associate fruit aromas with sweet tasting fruit. The red rings on the plot represent the 95% confidence ellipses. Consumers showed more discriminability between the UnSB, UnCB, UnCH, SWCH in the blind testing than in the informed. In Figure 4B there is more of an overlap between the confidence ellipses than there is for the samples in Figure 4A. There was less differentiation between the samples in the informed tasting. Less separation particularly between the unwooded Chenin, Chardonnay and Sauvignon wines.

The WSB sample was associated with the negative emotional terms, distrust, worried, disappointed, fear, dissatisfied and discontented. The UnSB, UnCB, UnCH, SWCH were positively correlated with positive emotions relaxed, pleasant, contented, happy, pleased and refreshed.

There were no significant differences. Overall the configurations of the CA plots for the blind and informed tastings are very similar. There was however more overlap between the confidence ellipses for samples UnSB, UnCH, SWCH and UnCH, in the informed tasting, indicating that there was less discrimination between samples when consumers knew the cultivar.

3.4 RV coefficients: method consensus analysis

Rv coefficients were determined to compare the configurations of the plots (Louw et al., 2013) from the results of the DA, free description and consumer CATA (blind and informed) tastings (Table 6).

Table 6 Comparison of the consensus between the overall product configurations obtained with blind and informed consumer tastings and the expert and trained assessors

Plot 1	Plot 2	Rv	p Value
Consumer CA blind	Professional CA	0.76	0.01
Consumer CA blind	DA biplot PC1 vs PC2	0.85	0.00
Consumer CA informed	Professional CA	0.86	0.00
Consumer CA blind	Consumer CA informed	0.91	0.00
Consumer CA informed	DA biplot PC1 vs PC2	0.93	0.00
Professional CA	DA biplot PC1 vs PC2	0.93	0.00

According to literature, similarities between the configurations is confirmed by the high Rv values above 0.6 (Ares et al., 2015; Do, Patris, & Valentin, 2009; Lelièvre et al., 2008). Therefore, we conclude that there were no significant differences between the composition of the sensory plots. When comparing the blind and informed tastings the Rv value was 0.91. The similarity of the plots produced by the expert free description and the DA was very high with an Rv value of 0.93. Rv was lowest between consumer blind and professional free description, but it was still significant. Seeing as wine is a complex product, and agreement tends to be lower with complex products, lower Rv values can be expected (Ares et al., 2015).

3.5 Consumer liking and familiarity

3.5.1 Overall Consumer Liking

Two-way ANOVA with sample, and gender as between-subject variables was done. The only significant factor in both the blind (F = 6.56, $p < 0.05$) and informed (F = 4.13, $p < 0.05$) liking tests was sample (Table 7).

Table 7 Results of ANOVA for consumer blind and informed liking results. (Bold indicates significant p-values, ns= not significant).

Blind			
Effect	**Num. DF**	**F**	**p**
Gender	1	0.545848	ns
Sample	6	6.563051	**0.000001***
Gender*Sample	6	0.501662	ns
Informed			
Effect	**Num. DF**	**F**	**p**
Gender	1	2.508826	ns
Sample	6	4.135133	**0.000424***
Gender*Sample	6	1.669406	ns

* indicates significant p value

The average liking between six of the seven samples was not significantly different (Figure 4). Consumers slightly liked all the samples giving them an average score around 6 on the liking scale. Generally an overall liking score of six on a nine-point scale indicates a well-accepted product (Moskowitz, Beckley, & Resurreccion, 2012). However, the WSB sample significantly differed from the other six and was liked less. The WSB - wooded Sauvignon blanc - was the least liked of all the wines, and this could be due to the fact that it was very green and is an

unusual style, and probably unfamiliar to most consumers as it is only made by very few producers and therefore not frequently available in the South African wine market.

The average liking scores changed but not significantly between the blind and informed tastings (Figure 4), increasing for all samples except the wooded Chardonnay. It would seem that knowing cultivar does not have a significant effect on liking of white wine. This could be due to the fact that all the wines were dry white wines and had similar sugar and acid contents (Table 1) despite the fact that they were all made in different styles. The results may have been different if we had included a wine with higher sugar content.

Apart from the WSB sample which was rated as neither liked/nor disliked" on the 9 point scale. The lack of variation could be due to the tasting environment, the psychological effect of not wanting to give "the wrong answer", or simply that they did not have a strong preference for any of the wines.
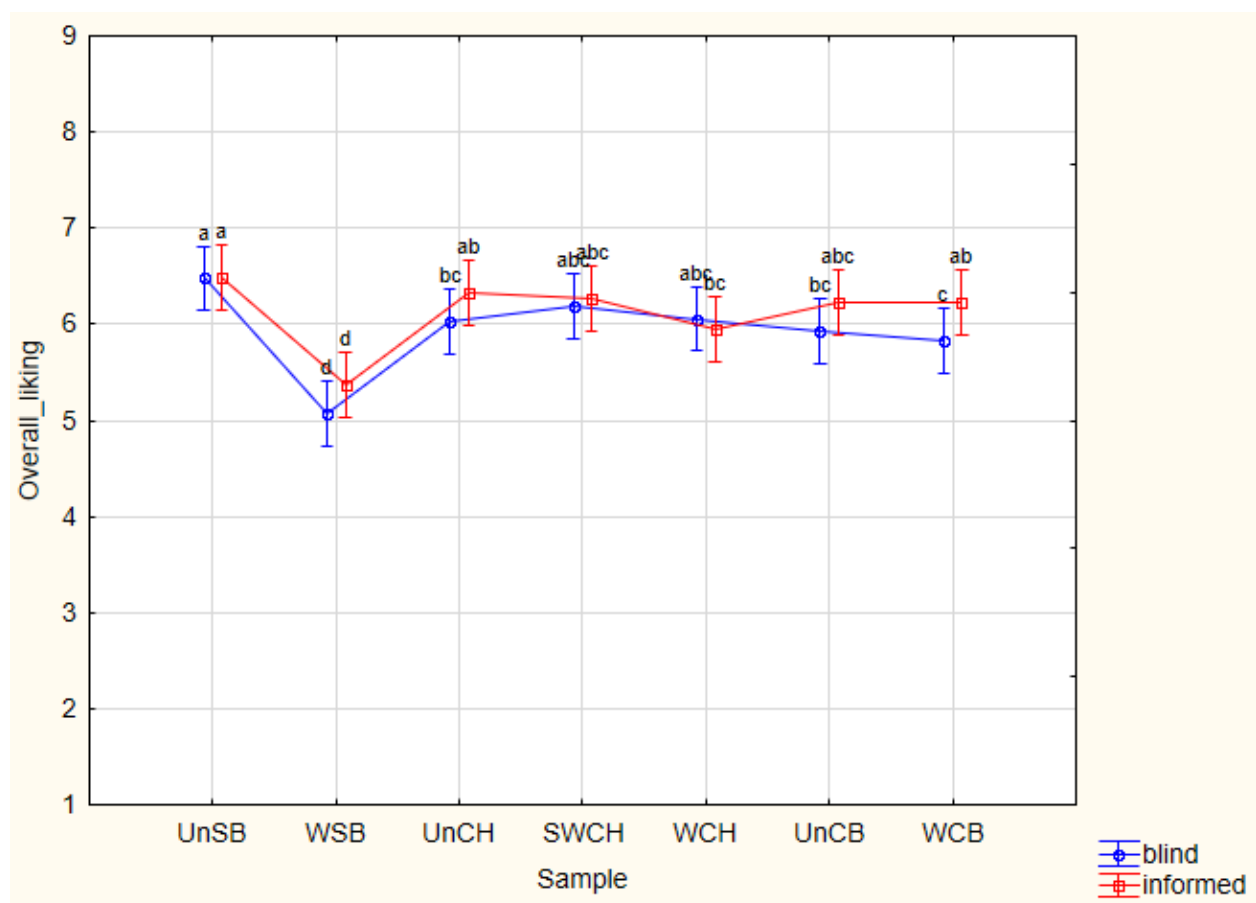

Figure 4 The average liking scores given by consumers under blind and informed conditions. Vertical bars denote 95% confidence intervals.

Looking at the emotional terms in the CA plot from the consumer CATA (Figure 3) also helps to validate the liking data. Consumers used more positive emotional terms to describe the UnSB,

UnCH, UnCB and SWCH wines including, pleasant, merry and refreshed. The WSB on the other hand was described by more of the negative emotional terms including distrust, dissatisfied and disgust. Other studies on white wines have also found that consumers found green aromas to be negative and fruity aromas to be more positive (E. S. King, Osidacz, Curtin, Bastian, & Francis, 2011; Lesschaeve, Bowen, & Bruwer, 2012). The emotional terms chosen were however more strongly positive or negative, than the average liking score of 5, which translates to neither like nor dislike. This leads one to question, of which one is more accurate, the emotional description or the liking?

3.5.2 Consumers Wine knowledge

This knowledge is subjective and was not tested. The majority of consumers placed themselves in the "novice" and "somewhat knowledgeable" categories (Figure 5). Despite most of the consumers saying that they had limited wine knowledge, they were still able to describe and distinguish between the wines similarly to the professional and trained panels.
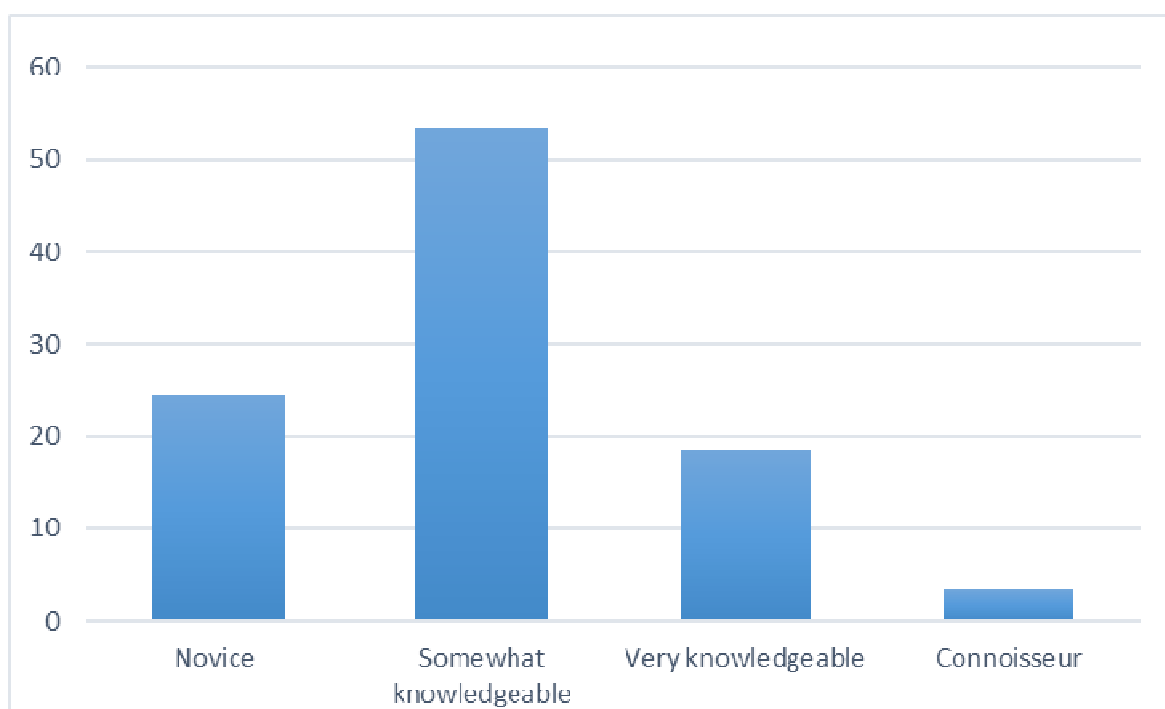

Figure 5 Consumers subjective knowledge

3.5.3 Consumer familiarity with the cultivars

Of the three cultivars tested, Sauvignon blanc was the most familiar and most consumed wine by this set of consumers (Figure 6). Consumers said that they were most familiar with Sauvignon blanc, followed by Chardonnay and then Chenin. Chardonnay was most cited as 'I have tasted it before but do not drink it'.
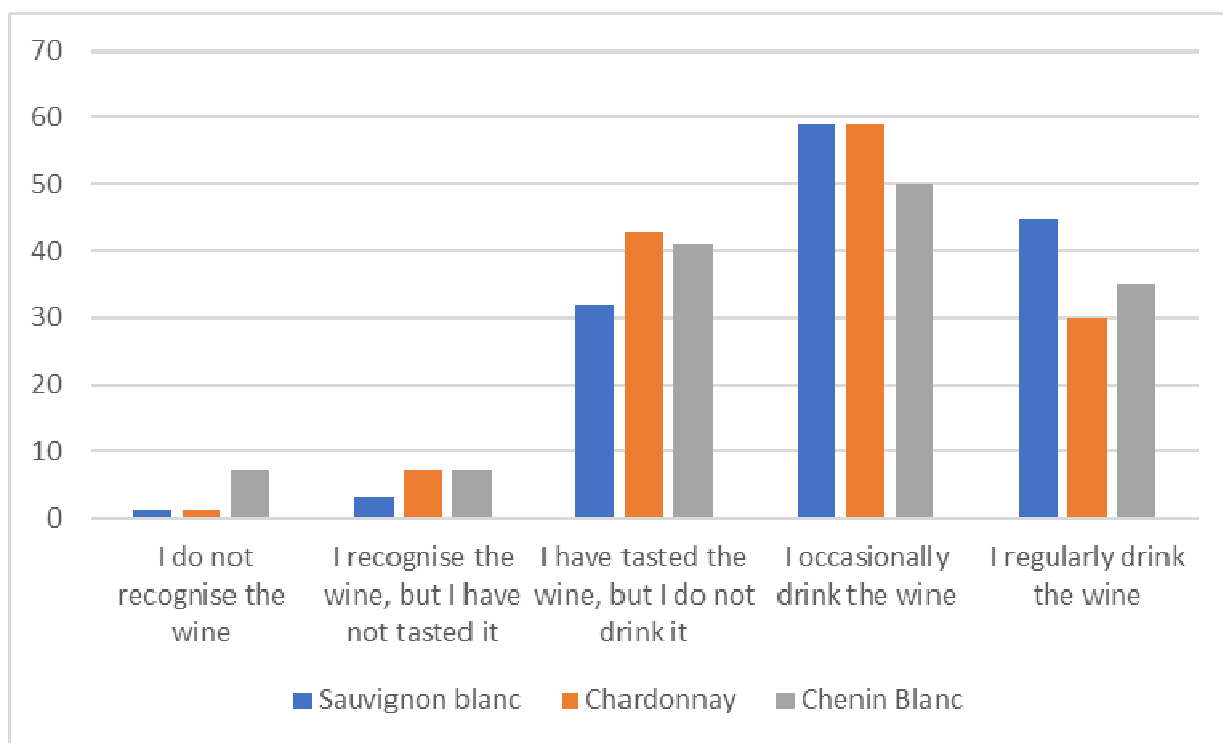
Figure 6 Consumer familiarity with the three white cultivars.

Although this was a relatively small group of consumers the results mirror the sales figures for the country (SAWIS, 2016), Sauvignon blanc is the most familiar to consumers, which explains why it has the highest sales. The "familiar" style of the unwooded Sauvignon blanc was also slightly more liked than all the other samples in the set.

3.6 Industry professionals' thoughts on differences between the white cultivars

According to the professionals there is a continuum that forms between the three cultivars, with Sauvignon blanc and Chardonnay at the extremes. This was evident in the results of the sensory profiling, the wooded buttery wines (Wooded Chenin and Chardonnay) on one side of the plot and the green Sauvignon blanc on the opposite side, with the rest of the set clustering between them (Figure 2).

When the professionals described the wines they often described them in relation to one another. For example, Sauvignon blanc is greener than Chenin blanc, Chenin blanc has riper fruit aromas than Sauvignon blanc, Chardonnay is more buttery than Chenin blanc, or Chenin blanc and Chardonnay have more complex mouthfeel than Sauvignon blanc.

Overall the consensus was that Sauvignon blanc can be green, has very tropical aromas, high thiol levels, and is usually high in acidity. Chardonnay was described as low in acidity ranging from unwooded to heavily wooded, complex full-bodied wines. Chenin blanc was described as anything from tropical with medium acidity to complex wooded full-bodied wine. In short Chenin has more complex fruit aromas than Chardonnay and is less green than Sauvignon blanc. However, one expert summed the issue up well saying: "*These days, however, all these*

characteristics can change through different harvest times, different yeasts and different fermentation methodologies". This just adds to the potential confusion of the consumer. Seeing a cultivar name on a label does not necessarily tell you what you should expect from the wine.

Previous studies have focussed on individual elements covered in this chapter, using different food products not limited to wine for example emotional profiling (Ng et al., 2013), comparison of sensory profiles generated by different panels (Ares et al., 2015) and influence of extrinsic cues on description and liking (Varela, Ares, Giménez, & Gámbaro, 2010). The novelty of this study lay in the approach of combining all of the abovementioned elements (emotional profiling, comparison of sensory profiles and the influence of extrinsic cues on descriptions and liking) to investigate and compare different wine cultivars.

4. Conclusion

4.1 Wine sensory descriptions

In this study, blind, all three groups of tasters and tasting methods gave very similar answers and distinguished between this sample set of wines in a similar fashion. Consumers with limited wine knowledge were still able to use the terms generated by industry professionals and trained assessors to describe wines in a similar fashion. The results of this study suggest that consumers, wine professionals, and trained assessors for the most part interpret the sensory properties of wine in a similar way. Three different methods using three different groups of people produced very similar results confirming once again that using rapid methods, with consumer and trained professionals are viable alternatives to DA. The professionals were able to discriminate between the wines slightly better than the trained panel but the general pattern was the same. There was less discrimination between samples by the consumers, but this could also be due to the limited number of terms on the CATA list.

In this small set of wines, the cultivars did not separate, and there was already significant overlap between the descriptions. The professionals' opinions of the sensory continuum that exists between the cultivars, aided in explaining the configurations of the wines in the plots, and the lack of discrimination between some of the samples. We hypothesise that there are fewer perceivable differences between the three test cultivars than one anticipates. Using cultivar as a "brand" is therefore also not suggested, as the overlap in sensory characteristics between cultivars may be adding to consumers confusion.

4.2 Consumers and liking

Consumers that participated in this study mostly described themselves as novices and only somewhat knowledgeable and for them knowing the cultivar name did not significantly change

the way they described the samples, nor did it significantly alter their liking. This potentially may have differed if consumers with varying wine knowledge were used. Even though the samples were all different cultivars made in different styles, on average they were all received positively.

At the sales point (decision-making point) consumers are in most cases unable to taste the wine before purchasing it, and therefore rely heavily on extrinsic attributes, including but not limited to, cultivar and the descriptions on the wine label. The results of this study showed that cultivar did not significantly affect sensory perception or preference of the partcipants. We therefore hypothesize that wine preference, for consumers with limited knowledge may largely be based on price, availability, and extrinsic attributes, other than cultivar. This should be further investigated, using consumers with varying levels of wine knowledge and with tests where the informed conditions of the test include other extrinsic variables.

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Chapter 6

General discussion and conclusions

6. General discussion and conclusions

6.1 General discussion and conclusions

The aim of this study was to get a better understanding of South African consumers and their perceptions of wine and to develop scientific tools to achieve this aim. This will help the South African wine industry become more consumer driven and grow the domestic wine market. The following section discusses observations made throughout the course of this study, as well as highlighting the scientific contributions made by the work, while suggesting optimisations for future research.

The focus groups showed that wine in general is associated with status and sophistication, appearance, celebration, relaxation, and food. The fact that wine is consumed with food, is what seems to be the driving force differentiating wine from other alcoholic beverage categories. These results are not surprising, but emphasise their importance to consumers. Industry should focus on these ideals when developing new products or marketing existing ones.

Few differences were observed between consumers from different ethnic groups, in terms of their perceptions of wine. Although black consumers had a delayed start to their wine consumption, there were no significant observable differences found between the tested ethnic groups. This could be due to the relative similarities of the consumers demographics, as they were all professionals living in urban areas, where wine is freely available. They were also all working in professional environments and were exposed to wine through business functions and corporate gifts. Differences may possibly have been more pronounced if rural consumers had also been used as they have less exposure to wine due to a lack of availability. However, contacting rural consumers and getting them to participate would be challenging and costly, and the researcher would need to go to the consumers and conducting focus groups would be difficult due to language barriers. However that was out of the scope of this study, which looked at urban wine consumers. Financial limitations restricted the number of focus groups we were able to conduct, but recommendations for future research include increasing the number of focus groups, by including other ethnic groups and consumers living in other provinces of South Africa.

In-depth interviews like those conducted by the Moss group and CIA used for their research on a large scale, could have been used as an alternative to focus groups in this study. However, such an approach would not have been practical. Firstly, due to financial constraints, and secondly because of the limited number of people with the required interviewing skills. Focus groups were therefore the better choice.

Several of the themes identified in the focus groups were further investigated in this study, however one which this study did not further investigate is occasions/context of consumption. This was one of the main contributors to differences observed between the males and females and should be further explored.

Barriers in terms of consumption etiquette, and unspoken rules, were identified as possible reasons preventing broader wine consumption. It is however, to some degree, these "*barriers*" that differentiate wine from other alcohol categories. This was best described in the focus groups by one participant who said: "*wine is like Ferrari, you don't need to advertise it everyone knows it's good*". This elite status is linked to the social motivation for wine consumption which came across strongly in both the focus groups and wine choice questionnaire. Although industry would like to see an increase in consumption, and make wine more accessible, the elite status is what makes wine appealing and this leads to the question: if everyone starts drinking wine, could it lose its appeal?

Overall, motivations for drinking wine between the consumers groups were found to be similar. The results of the wine choice questionnaire, showed social, sensory appeal and ethical concern to be the three most important motivational factors. This confirmed the findings of the focus groups, where social aspects of wine were found to be important. The importance of sensory appeal was also further motivation for Chapter 5's sensory study. Again, industry should take note of the emphasis that consumers placed on the importance of the social aspects of wine. Interestingly consumers seem to be conscious of ethical concerns, so adding ethical claims regarding production, or packaging to labels and/or advertising may have a positive effect on sales.

The wine choice questionnaire forms a foundation for further research, and there is definitely more to be gained. This study used the four-point importance scale from the original study, but expanding the scale length could possibly help to expand differences, although, using importance to measure these variables may not be the best choice. Using a technique like best-worst scaling (described in Chapter 2 section 4.2.2) may work better, but the number of items would need to be scaled down, as having to compare 43 items to each other, would become tedious for consumers to complete. Streamlining the structure of the questionnaire and the scale will help to get more specific results.

Generally, there seems to be a good level of agreement between industry professionals, trained panels, and consumers in terms of white wine sensory properties. When it came to the influence of cultivar name on liking, no significant differences were seen between the blind and informed

tests. With wine, one of the main challenges, is the sheer number of options available to consumers, and the fact that consumers seldom know what to expect from a wine unless they have tasted it before. We therefore hypothesize that consumers especially those with little knowledge (confirmed by the WCQ, where price was more important to novice consumers), choose wine based on price, circumstances, and extrinsic attributes other than cultivar, and rely on big popular "trusted" brands as safe choices.

Suggestions for future research include doing similar testing on red wines, as well as testing other extrinsic variables under both blind and informed conditions. Adding emotional descriptors to Check-all-that-apply helped to differentiate between samples in terms of liking. Living in the age of social media consumers are becoming more visual therefore using pictures, or emoji and combining them with word descriptions may further aid in understanding or eliciting consumers emotional responses to and liking of products.

One main observation when it came to consumer recruitment was that it was challenging to find males to participate. Looking at the statistics there are slightly more females that consume wine, so women may be more interested, and therefore more willing to participate in wine research. However, when looking at consumer research in general, the majority of participants in consumer studies, on both wine and other products, are female (Ares, Antúnez, et al., 2015; Ares & Jaeger, 2015; Bäckström, Pirttilä-Backman, & Tuorila, 2004; Baudry et al., 2017; Eertmans, Victoir, Notelaers, Vansant, & Van den Bergh, 2006; Januszewska, Pieniak, & Verbeke, 2011). Even in studies where a 50:50 gender ratio was the aim, if there is a majority, in most cases it will be female (Ares et al., 2011; Ares, de Saldamando, et al., 2015). One study where this was not the case was a study concerning beer (Gómez-Corona, Lelievre-Desmas, Escalona Buendía, Chollet, & Valentin, 2016). It appears to be easier to recruit female participants for consumer research, unless the topic is of specific interest to males, as was the case for the study on beer. This could also be related to the still prominent fact that more men work full time and do not have the time available to participate in such studies which are generally conducted during work hours.

In many countries cultivars have been branded successfully for example Sauvignon blanc in New Zealand and Shiraz in Australia. However the results of this study do not suggest that using white cultivars as a 'brand' has been successful in South Africa. If one thinks of soft drinks, when you go to a fridge and pick up a Coca Cola®, you expect it to taste like Coca Cola®, not Sprite® or Fanta®. The issue with some of the white cultivars in South Africa is that there appear to be many overlapping styles and consumers don't know what to expect. The experts themselves said there is a sensory continuum that forms between specifically Sauvignon blanc, Chenin blanc and Chardonnay. This overlap possibly driven by the array of

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yeasts, vineyard practices and wine making techniques available, results in a lack of identity. Industry needs to try and minimize confusion, by working on communicating style to the consumer on the label, so that consumers can have a better idea of what to expect from a wine before they taste it. A suggestion is perhaps to use standard sliding scales on labels to indicate sweetness, acidity and wood content, however this would need to be tested.

Overall knowledge seems to be the biggest variable affecting wine consumption. Knowledge is more important with a complex product category like wine (Ellis, 2015). The limited consumer knowledge in SA was noted by Ndanga et al. (2009) almost 10 years ago, and it seems as though not much has changed. There seems to be a general lack of wine knowledge amongst consumers, demonstrated across all three research chapters where the majority of consumers described themselves as either novices or having only a small amount of wine knowledge. Knowledge level significantly affected the perceived importance of the different factors in the WCQ. Interestingly differing levels of consumer involvement did not reveal significant differences in motivation, so knowledge seems to be more important than involvement.

Looking once again at the factor web (Figure 1) knowledge is affected by or affects all the other factors in the web. The previously stated problem with the cultivars shows the link between lack of knowledge and the resultant issues with extrinsic and intrinsic factors (Figure 1).
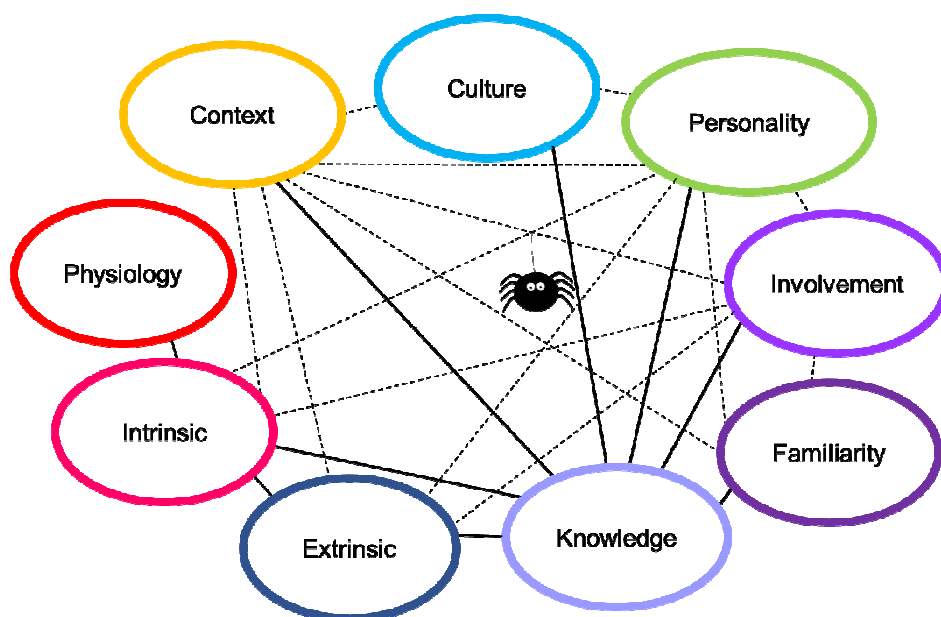

Figure 1 Web of factors affecting consumption.

In order to increase sales and combat incorrect perceptions consumers may have (e.g. sulphur causing headaches), the wine industry needs to work on increasing consumers knowledge. However this could prove to be a problem. It was made clear during the focus groups and the tastings that there seem to be two kinds of consumers, those who are interested in learning

more and those who simply do not care. Participants made comments about not caring who made the wine or about the barrel it was in. This highlights the link between personality and knowledge (Figure 1) and poses a problem, because improving general wine knowledge is necessary, but some consumers are just not interested in learning.

A suggestion for helping to over-come the knowledge barrier is through social media. There is a global trend of consumers gravitating towards social media (Food Stuff South Africa, 2017). Social media provides an easy platform for communication with a wide range of consumers, especially in South Africa, where many consumers are located in different provinces. Along with social media comes visual decision making (Ching, 2017). If consumers see a product frequently enough, they are more likely to try it. Today, if you are unsure about anything, you "*Google® it*" and consumers are able to do so on their smart phones while they stand in a store. If the wine in question has no social media presence, or the website is difficult to navigate, chances are they will move on to the next option. Having an online presence is therefore vital. Wine producers should increase their online presence through, Apps, Facebook®, Instagram®, Twitter®, and try in small ways to subconsciously educate consumers and whilst simultaneously marketing their brands.

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Addendum A

Addendum A

1. Pre-test wine choice questionnaire

Institute for Wine Biotechnology STELLENBOSCH UNIVERSITY **It is important to me that the <u>wine</u> I drink on a typical day:**	Not at all important	slightly important	Moderately important	Very important
1. Is low in calories				
2. Contains antioxidants				
3. Is a treat				
4. Cheers me up				
5. Has a screw cap/ Can be re-sealed				
6. Is easily available in shops and supermarkets				
7. Helps me to cope with life				
8. Is low in sulphur				
9. Is produced with ethical production methods				
10. Has a cork				
11. Is biodynamic				
12. Is what I usually drink				
13. Smells nice				
14. Is white				
15. Helps me cope with stress				
16. Makes me feel good				
17. Makes me look/feel sophisticated				
18. Has a pleasant texture/ body/mouthfeel				
19. Is a well known brand name				
20. Tastes good				
21. Can be bought in a shop close to where I work/live				
22. Keeps me healthy				
23. Makes me feel confident				
24. Is good for my heart				
25. Helps me relax				
26. Looks nice/ Has a good colour				
27. Is packaged in an environmentally friendly way				
28. Is good value for money				
29. Is cheap				
30. Is not expensive				
31. Is familiar				
32. Is red				
33. Is organic				
34. Goes well with my food/meal				
35. Is low in alcohol				
36. Is made in South Africa and supports the local economy				
37. Is what my peers are drinking				