Objective and Subjective Wine Knowledge:
Evidence from an Online Study

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Purpose: This paper offers evidence on the relationship between objective and subjective wine knowledge and consumer demographics, as well as further exploring the nature of subjective wine knowledge. Design: This paper used an online study, aimed at measuring objective wine knowledge, and subjective wine knowledge using two different scales, and also testing the impact of consumer age, gender, education and actual consumption on these. Findings: This study confirms the significant positive link between objective and subjective wine knowledge. It also gives evidence of the convergent validity of both the short subjective wine knowledge scale used by Forbes, Cohen and Dean (2008) as well as the longer, more established subjective scale of Flynn and Goldsmith (1999)

1. CONSUMER KNOWLEDGE AND WINE MARKETING

One of the main reasons that wine is such a fascinating product to consumers in general and such a challenge to wine marketers is that consumer evaluations of it can differ so substantially. While one individual may love a particular wine, another consumer can be completely indifferent to it. The popular media is awash with stories of how expensive wines don't always perform well in blind tastings (e.g. Lehrer, 2011; WineX Magazine, undated; Kramer, 2011), and books have been written (e.g. Taber, 2005) and movies (e.g. Bottle Shock, 2008) produced about the real or supposed inability of experts to accurately judge the quality of wines. While Nobel Laureate Gary Becker (1998) disagrees, economists generally argue that there is no accounting for taste. Wine marketers and wine marketing scholars alike have long been interested in how knowledge impacts on the individuals ability to taste wine accurately, and to make decisions. Indeed the term "connoisseur" (from the Old French *connoisseor,* from *connoistre – "* to know") refers to someone who enjoys with discrimination and appreciation of subtleties, as in "a connoisseur of fine wines" (see http://www.merriam-webster.com/dictionary/connoisseur).

Consumer researchers (Brucks, 1985) have viewed knowledge from three perspectives: objective knowledge, subjective knowledge and familiarity. In simple terms, objective knowledge is the knowledge that the individual truly possesses, and is able to demonstrate. The individual shows objective knowledge when they are able to give the correct answer to a question. Subjective knowledge is what the individual believes or thinks they know about a particular topic (such as wine), and these perceptions may estimate knowledge correctly or incorrectly. Familiarity has more to do with the consumer's actual experience with a topic or product and has been defined as "the number of product-related experiences accumulated by a consumer" (Rao and Monroe, 1988), or as "representing the accumulated number of experiences with the product" (Perrouty, d'Hauteville, and Lockshin, 2006).

Despite the work of Forbes, Cohen and Dean (2008), less attention has been given to the relationship between objective and subjective wine knowledge, and the impact of broader demographics such as gender, age, education and actual wine consumption on wine knowledge. This paper attempts to bridge this gap by offering additional evidence on the relationship between objective and subjective wine knowledge and consumer demographics, as well as further exploring the nature of subjective wine knowledge. It proceeds as follows: First, it briefly reviews the literature on consumer objective and subjective knowledge with specific reference to wine knowledge. Then it outlines a study aimed at measuring objective wine knowledge, and subjective wine knowledge using two different scales, and also testing the impact of consumer age, gender, education and actual consumption on these. The findings are presented and discussed. The paper concludes by acknowledging the limitations of the research, considering the implications for managers within the wine industry, and identifying future avenues of research for wine marketing scholars.

The levels of consumer knowledge in a target wine market, both objective and subjective, are of considerable importance to wine marketers. This is because how much target consumers know, or think they know about wine can potentially impact every aspect of

wine marketing strategy. At times the wine marketer might wish to target consumers with high knowledge in a branding strategy. For example the Australian wine company Penfolds targets wine connoisseurs with its fable Grange (which sells at around $500 per bottle), and also markets brands such as Rawson's Retreat and Koonunga Hill, which sell at around $10 per bottle. While the wine neophyte might associate Mouton Cadet with Bordeaux first growth Chateau Mouton Rothschild – as the company intends – the aficionado knows that Cadet grapes are not even all sourced in bulk from Pauillac, let alone grown at Mouton Rothschild. Wine marketers might offer lower priced products to consumers with less wine knowledge, and who might believe that there really is no discernible difference between expensive and cheap wines. Distribution decisions are also impacted by the wine marketer's assessment of the levels of knowledge within their target market. Marketers who target connoisseurs will choose outlets with skilled and knowledgeable sales staff and excellent storage facilities, while those who target low knowledge consumers might choose supermarkets. With regard to marketing communication, marketers who target high knowledge wine consumers will probably use specialist media including *Wine Spectator*, and *Decanter* magazines, while those targeting neophytes might employ mass media such as television, with simple messages about the fun of drinking wine, and using simple and sometimes silly brand names such as Yellow Tail, Fat Bastard, and Cat's Pee on a Gooseberry Bush.

Some wine marketing scholars have studied consumer knowledge with specific reference to wine. Mitchell and Hall (2001) interviewed a large sample of winery visitors in New Zealand and explored the relationship between subjective wine knowledge and other wine behavior variables such as wine club participation, wine consumption at home, and median monthly wine purchases. Also in the context of New Zealand, Beverland (2003) considered consumer knowledge with regard to the specific class of wine, finding more knowledgeable consumers are less likely to purchase at general liquor stores or supermarkets, and are also likely to spend more on better, or more expensive wine. Orth (2002) in a study in the Czech Republic found that less knowledgeable wine were more likely to utilize the medals displayed on bottles as cues as an indicator of good quality when purchasing wine. In particular, these consumers employed the medals attribute as a means to conveniently and quickly identify those wines that were good value for money, implying that awards can be used by marketers to target less knowledgeable consumers. Perrouty, d'Hauteville, and Lockshin (2006) studied how the region of origin as a component of a wine brand adds value to a wine purchaser. They considered whether commercial brand, level of price, type of bottler, and grape variety were moderating effects on consumer subjective knowledge in a large sample of European wine consumers. They found that the region of origin's prestige was significantly moderated by the other wine attributes, and that these were more important for consumers with high subjective knowledge.

Forbes, Cohen and Dean (2008) developed an objective knowledge of wine test and used this in conjunction with an amalgam of items from a general consumer knowledge scale (Flynn and Goldsmith, 1999), and a previous subjective wine knowledge scale (Perrouty, d'Hauteville, and Lockshin, 2006), to test the relationship between subjective and objective knowledge, and how these were impacted on by variables such as age, gender, education and consumption. While they attempted to test this across four nationalities (New Zealand, Australia, United Kingdom, USA), in reality New Zealand consumers

dominated the sample and the study was carried out in New Zealand. Briefly, their most important findings were that subjective and objective wine knowledge are significantly associated, that objective knowledge and familiarity (or wine consumption) are significantly correlated, that males were significantly more objectively knowledgeable than females, and that higher objective knowledge was significantly linked to a higher education level.

Our objectives in the study described here were threefold:

1. To confirm the significant positive link between objective and subjective wine knowledge established by Forbes, Cohen and Dean (2008) in another national market, and in an online environment
2. To explore the convergent validity of the short subjective wine knowledge scale used by Forbes, Cohen and Dean (2008) by adding a longer, more established subjective scale from the literature to our questionnaire.
3. To determine the effects of age, gender wine consumption, education, and also the number of wine blogs read, on objective wine knowledge.

2. METHODOLOGY

We investigated our research questions by developing and fielding an online survey. The survey featured four sections. The first section included the Forbes, Cohen and Dean (2008) four-item scale designed to measure each respondent's subjective wine knowledge, the items for which are shown in Table 1. The second section featured the Forbes, Cohen and Dean (2008) objective measure of wine knowledge, a series of five multiple choice questions each featuring five choices, of which only one was correct (see Table 2). In the third section respondents completed a nine-item scale again measuring their subjective wine knowledge (also shown in Table 1). This we adapted directly from Flynn and Goldsmith's (1999) general short measure of subjective consumer knowledge. The final section collected additional variables, which included age, gender, number of wine blogs regularly read, education level, and number of bottles of wine consumed in an average two week period.

The survey was conducted using Amazon.com's MTurk marketplace for respondents. From a social science research perspective, MTurk is an online marketplace that enables researchers (known as Requesters) to outsource "work", normally in the form of questionnaire completion. Requesters are able to post tasks known as HITs (Human Intelligence Tasks), such as completing a survey, and respondents or "workers" (called Providers on MTurk) can then browse among existing tasks and complete them for a monetary payment. In order to stratify samples, the researcher is able to specify that Workers (respondents) fulfill qualifications before engaging a task, and they can set up a test in order to verify the qualification. They can also accept or reject the result sent by the worker, which reflects on the worker's reputation. While workers can have an address anywhere in the world, we specified that the respondents to this study should be based in the USA. Researchers have also given attention to the feasibility of MTurk to recruit subjects and respondents in the social-science experiments (Paolacci, Chandler, and Ipeirotis, 2010; Buhrmester, Kwang, and Gosling, 2011). In the USA at least, the general conclusion to date is that while the samples of respondents obtained through MTurk do

not perfectly match characteristics of the U.S. population, they are also not wildly inaccurate or skewed. The cost of MTurk is generally much lower than other means of conducting surveys. We offered respondents $1 to complete our survey.

The presentation of items within each scale was randomized to reduce order effects. Several questions measuring respondent attention were included to ensure reliability of the resulting data. The survey was administered to wine drinkers and 218 consumers completed the survey. Data from 31 respondents was discarded due to evidence they were not paying attention while completing the survey. As a result, a useable sample of 187 respondents was retained. Our sample included 73 males and 114 females. More detailed sample characteristics are reported in Tables 3-5.

Both of the subjective wine knowledge scales loaded onto a single factor and exhibited satisfactory Cronbach's alphas. As a result each were summed for analysis. For the test measuring objective wine knowledge each question was assessed as either correct (1 point) or incorrect (0) and summed across the five questions. The mean of the test was 1.91 with a standard deviation of 1.137. Regression analysis using SPSS was employed to investigate the effect of subjective wine knowledge on objective wine knowledge.

2.1 Findings

To investigate the relationship between the three measures employed in the study we first calculated correlations between each measure. These are reported in Table 6 and show a strong correlation between the two subjective wine knowledge scales. Interestingly, we note a stronger correlation between objective wine knowledge and the 9-item subjective wine knowledge scale than the 4-item version. This suggests that the order of scales might have had an impact, with respondents learning from their experience responding to the objective wine knowledge test. We also ran two regressions to shed light on the issue. Two regressions were in light of multicollinearity concerns due to such strongly correlated variables. We first regressed the 4-item subjective wine knowledge scale on objective wine knowledge, explaining a significant proportion of variance in objective wine knowledge ($R^2 = 0.195$, $F(1, 186) = 7.302$, $p < 0.008$). The 4-item subjective wine knowledge scale significantly predicted objective wine knowledge ($b = 0.044$, $t(186) = 2.702$, $p < 0.008$). We next regressed the 9-item subjective wine knowledge scale on objective wine knowledge yielding a similar, although stronger, pattern of results ($R^2 = 0.293$, $F(1, 186) = 17.377$, $p < 0.000$; $b = 0.008$, $t(186) = 4.169$, $p < 0.000$). The larger R^2 of the second regression is consistent with the correlations indicating a stronger relationship between the 9-item subjective wine knowledge scale that was administered after the objective wine knowledge test. This suggests respondents were better able to judge their own level of wine knowledge following completion of the objective wine knowledge.

In a second regression we next explored factors predicting respondents objective knowledge. Since it had the strongest relationship with objective wine knowledge the 9-item subjective wine knowledge scale was investigated. Age, gender, number of wine blogs regularly read, education level, and number of bottles of wine consumed in an average two week period were also included in the regression. Together these six variables explained a significant proportion of variance in objective wine knowledge ($R^2 = 0.508$, $F(6, 186) = 10.424$, $p < 0.000$) and results are summarized by variable in Table

7. Higher subjective wine knowledge, higher age, higher education, and being female are all significant predictors of higher objective wine knowledge levels. Higher consumption of wine in an average two-week period and a greater number of wine blogs read were not significant predictors of higher objective wine knowledge. The same regression was also conducted employing the 4-item version of the subjective wine knowledge scale rather than the 9-item version. Results paralleled those reported, with no changes to the pattern of significance.

Table 1. Measurement Scale Characteristics

Scale	Subjective Wine Knowledge Scale (4 item) Forbes, Cohen and Dean (2008)	Subjective Wine Knowledge Scale (9 item) Flynn and Goldsmith, 1999
Cronbach's Alpha	0.890	0.929
Scale Statistics	Mean: 15.83 Standard Deviation: 5.076	Mean: 33.66 Standard Deviation: 10.187
Items	I don't understand much about wine. (R)	I know pretty much about wine. (R)
	I am confident in my knowledge of wine.	I know how to judge the quality of a bottle of wine.
	Among my friends, I am the wine expert.	I think I know enough about wine to feel pretty confident when I make a purchase.
	I know less about wine than others do. (R)	I do not feel very knowledgeable about wines.
		Among my circle of friends, I'm one of the "experts" on wines.
		I have heard of most of the new wines that are around.
		Compared to most other people, I know less about wines.
		When it comes to wine, I really don't know a lot.
		I can tell if a bottle of wine is worth the price or not.

Note: All scale items measured using 7-point Likert scales anchored by Strongly Agree and Strongly Disagree.

Table 2. Objective Wine Knowledge Test Questions

Question	Answer Choices (Correct choice in *italics*)

Which of the following is a red wine?	Riesling Chardonnay *Merlot* Sauvignon Blanc Don't know
A peppery character is most associated with which wine?	Merlot *Shiraz/Syrah* Semillion Pinot Noir Don't know
Which grapes are never used to make Champagne?	Chardonnay *Riesling* Pinot Noir Pinot Meunier Don't know
Which is not a famous French wine region?	Bordeaux Champagne *Rheingau* Alsace Don't know
Which is the name of New Zealand's famed Sauvignon Blanc region?	Kapiti Hawkes Bay Waipara *Marlborough* Don't know

Table 3. Sample Characteristics: Wine Consumption

Bottles per Two-Week Period	Frequency
1 or less	95
1 to 2	58
3-4	23
4+	11

Table 4. Sample Characteristics: Education

Education	Frequency
Less than high school	1
High school /GED	15
Some college	56
2 year college degree	22
4 year college degree	68
Masters	23
Doctoral	2

Table 5. Sample Characteristics: Age

Age Group	Frequency
18-25	47
26-34	71
35-54	55
55-64	12
65+	2

Table 6. Correlations Between Measures

	Subjective Wine Knowledge Scale (4-item)	Subjective Wine Knowledge Scale (9-item)	Objective Wine Knowledge Test
Subjective Wine Knowledge Scale (4-item)	1		
Subjective Wine Knowledge Scale (9-item)	0.870**	1	
Objective Wine Knowledge Test	0.195**	0.293**	1

*Note: All correlations significant at the 0.01 level (2-tailed) are denoted with ***

Table 7. Regression Results

Variable	Beta	Standardized Beta	t	Significance
Subjective Wine Knowledge Scale (9-item)	0.030**	0.265**	3.697	0.000
Age	0.222**	0.181**	2.739	0.007
Male	-0.523**	-0.225**	-3.472	0.001
Bottles of Wine Consumed in Two Weeks	-0.123	-0.097	-1.381	0.169
Education Level Achieved	0.218**	0.242**	3.628	0.000
Number of Wine Blogs Regularly Read	0.121	0.071	0.995	0.321

*Note: All beta coefficients significant at the < 0.05 level are denoted with ***

In summary, this study confirms the significant positive link between objective and subjective wine knowledge previously established by Forbes, Cohen and Dean (2008),

this time, in another national marketing, and in an online environment. It also give evidence of the convergent validity of both the short subjective wine knowledge scale used by Forbes, Cohen and Dean (2008) as well as the longer, more established subjective scale of Flynn and Goldsmith (1999), as the scores from these two scales correlated highly and significantly. Like Forbes, Cohen and Dean (2008), this study also found that higher age, and higher education are significant predictors of higher objective wine knowledge. Unlike these authors however, we found the opposite effect with respect to gender, namely that being female significantly predicted higher objective wine knowledge, and we were also unable to find a significant relationship between wine consumption and objective wine knowledge. New to this study, we were also unable to establish a significant relationship between the extent of wine blog readership and objective wine knowledge.

3. DISCUSSION

This research is limited in that it utilized an online survey, so that all of the drawbacks customarily associated with internet based studies are present here. While we strove to prevent any form of respondent bias in using MTurk, it is unlikely that we were able to eliminate all of this. Furthermore, we used an objective wine knowledge scale developed in New Zealand, and this may not be as appropriate in a North American setting.

The results presented here also present avenues for future research. First, the shorter subjective knowledge scale of Forbes, Cohen and Dean (2008) performs quite well from a psychometric perspective. It could be used with confidence in future work, particularly where subjective wine knowledge is not a predictor variable, but one of a number of criterion variables being studied. The marked differences in gender effects between this study and previous work are also deserving of future work, and raise a number of questions: Are there genuinely differences between New Zealand and US wine consumers, or were these due to some random error? Was the finding in this study perhaps due to a sample bias induced by the MTurk user profile, where it is a known fact that females outnumber males? As wine blogs become more and more common, and as access to the websites of wine tastemakers such as Robert Parker and Jancis Robinson become ever more expensive, researchers might also want to study them and their effects on wine knowledge more carefully.

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