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Consumer Sensory Evaluations of Wine Quality: The Respective Influence of Price and Country of Origin

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Abstract

The purpose of the study was to investigate the respective influences of price and country of origin as extrinsic cues on consumer evaluations of wine quality when all intrinsic cues are experienced through sensory perception. Taste testing experiments were conducted (N = 263) using Chardonnay as the test product in a 3 (country of origin, COO) × 3 (price) × 3 (acid level) conjoint analysis fractional factorial design. Price and COO were both found to be more important contributors to perception of wine quality than taste. Reliance on extrinsic cues was found to remain extremely robust even when all intrinsic cues were available through sensory experience for respondent evaluation. The research demonstrated that even when evaluating a product through consumption, consumer belief in the price/value schema dominates quality assessment. These findings mean that marketers cannot assume that intrinsic product attributes, even when experienced, will be weighted and interpreted accurately by consumers. The research significantly advances our understanding of consumers' use of extrinsic cues (price and COO specifically), and their respective influence in their determination of both expected and experienced quality. (JEL Classification: Q11, D12, M31)

I. Introduction

Products and services are comprised of both intrinsic and extrinsic cues used by consumers to form opinions of expected or experienced product quality. Extrinsic cues are attributes closely associated with a product or service but have no affect on objective product quality or performance, for example, price, brand or warranty. Conversely, intrinsic cues are those attributes that can not be altered without changing the inherent nature of the product, such as ingredients in a food product or the seating capacity of a vehicle (Olson, 1972). The literature shows that consumers vary in their ability to accurately evaluate both types cues for a number of reasons, including: lack of product knowledge, misunderstanding, lack of important information and situational circumstances (Alba and Hutchinson, 2000; Northen, 2000; Quester and Smart, 1998; Rao and Monroe, 1988). The risk for

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managers is that valuable resources could be employed emphasizing product attributes that are not regarded, or even understood, by consumers as important in their decision making. Therefore, a distinct advantage may be realized by understanding the respective influence of intrinsic and extrinsic cues alike, in order to ensure that product development and marketing efforts are focused towards enhancing those product characteristics most likely to favorably influence consumers' opinions.

The focus of this research was to investigate the respective influence of the extrinsic cues of country of origin (COO) and price, when product intrinsic cues are fully experienced by consumers through sensory perception. This was achieved through the analysis of data collected by taste testing experiments, where objective product quality was affected by the manipulation of a critical intrinsic product attribute. Previous studies have assessed the influence of price (among selected other extrinsic cues) using a variety of sensory evaluation methodologies, including taste tests and visual impressions (Hurling and Shepherd, 2003; Pechmann and Ratneshwar, 1992; Wansink et al., 2000). However, research testing the specific influence of COO on consumer perceptions of product quality using taste testing methodology in this manner is limited, representing an opportunity to expand our understanding of the importance placed on experienced intrinsic cues by consumers when assessing quality (Aaron, Mela and Evans, 1994; A cebron and Dopico, 2000; Becker, 2000; Bredahl, 2003; Hoffmann, 2000; Imram, 1999; Koch and Koch, 2003; Liefeld et al., 1996; Pechmann and Ratneshwar, 1992; Richardson et al., 1994; Roper, 1969; Zellner and Durlach, 2003).

A. *Consumer Use of Product Cues*

The literature confirms that consumers evaluate both intrinsic and extrinsic attributes when forming opinions of product quality and will rely more heavily on the cues (intrinsic or extrinsic) they feel confident to interpret and believe to be reliable predictors of quality (Bredahl, 2003; Olson, 1972; Richardson et al., 1994). Research has shown that, logically, intrinsic cues are likely to be given more credence over extrinsic cues; however, this will not be the case when perceived intrinsic cues are found insufficiently predictive or when consumers are unable to accurately assess their influence on quality (Agrawal and Kamakura, 1999; Srinivasan, Jain and Sikand, 2004). Examples of extrinsic cues commonly believed to be strong indicators of quality (or offering high levels of emotional or status appeal) are brand name, price, retail outlet and COO (Dodds, 1991; Gluckman, 2001; Kardes et al., 2004; Lee and Lou, 1996; Liefeld et al., 1996; Lin and Sternquist, 1994; Richardson et al., 1994). Equally then, situational influences can increase reliance on extrinsic cues, for example when intrinsic cues are unavailable or when purchasing products associated with self-image, status or high risk (Kardes et al., 2004; Maheswaran, 1994; Piron, 2000; Quester and Smart, 1998). Therefore, while the literature demonstrates that intrinsic cues are usually given more credence by consumers predicting and/or evaluating product quality, intrinsic product attributes can also be discounted in favor of extrinsic cues under contributing circumstances or if consumers believe them to be more easily understood or reliable.

B. *Country of Origin and Price as Extrinsic Cues*

Whilst an extensive body of literature exists relating to the investigation of country of origin (COO) effect on consumer behavior, research in this area is ongoing. A significant motivating factor is the ever increasing competitive pressure felt by managers and marketers in modern organizations competing in the global market place, seeking to exploit any possible opportunities presented by a positive country/product connection, and equally, to overcome any potentially negative bias against products they produce (Badri, Davis and Davis, 1995; Bilkey and Nes, 1982; Chao, 2001; Phau and Prendergast, 2000; Srikatanyoo and Gnoth, 2002). COO is typically considered the source country for a product or service provider, but this may be different from the country of design, brand or manufacture (Chao, 2001). Country image (CI) is one important aspect of the complex COO construct, with consumers forming country specific 'profiles' comprised of psychological associations from a wide range of information sources, including knowledge of products produced, level of industrialization, economic strength, political history and impressions of traditions and culture (Piron, 2000). The resulting CI may then be used as an extrinsic cue by consumers forming quality expectations related to products from a given source country (Badri et al., 1995; Han, 1989; Han, 1990; Kotler and Gertner, 2002; Nebanzahl and Jaffe, 1996; Papadopoulos and Heslop, 2002; Srikatanyoo and Gnoth, 2002). Results of COO studies are rarely considered generalizable, as the impact has been found to be largely product and market specific, but some common effects have emerged. These include a more significant reliance on CI by consumers when they are evaluating high cost/high involvement products, when they have limited personal knowledge to rely on or when the CI and product category are highly congruent, for example, French wine or Australian wool (Eriksson and Hadjikhani, 2000; Eroglu and Machleit, 1988; Han, 1989; Han, 1990; Papadopoulos and Heslop, 1989; Papadopoulos and Heslop, 1993; Piron, 2000; Srikatanyoo and Gnoth, 2002). Studies also show that products from developed, industrialized nations are generally preferred (by consumers from both developed and less developed countries alike) over products from newly developing nations, (Chao, 1992). Over time, these industrialised countries have accumulated 'country equity' and their perceived product quality is expected to be superior, embodying better reliability and product performance (Bilkey and Nes, 1982; Chao, 2001; Hui and Zhou, 2003; Jo et al., 2003; Kaynak et al., 1999; Lin and Sternquist, 1994; Mohamad et al., 2000; Nagashima, 1970). In summary, the importance of COO (as with other extrinsic cues) has been found largely dependent on the cumulative knowledge and experience a consumer has with a product and/or product category, the quality and quantity of other pertinent additional information available and their ability to interpret it accurately.

Similarly, the influence of price has also been studied extensively with research confirming it as one of the most strongly weighted extrinsic cues used consistently by consumers to predict quality, across a wide range of products (Verdú Jover et al., 2004; Kardes et al., 2004; Pechmann and Ratneshwar, 1992; Sullivan and Burger, 1987). This price/quality relationship, described in the literature as the 'price-value' schema, reflects

consumers' strongly held belief that 'you get what you pay for' (Lee and Lou, 1996). As with COO, price is even more powerful when predictive intrinsic cues are not available and/or not understood (Dodds, 1991; Kardes et al., 2004; Monroe, 1976). For example, Verdú Jover et al., (2004) found in their study measuring the impact of extrinsic variables on consumer expectations and evaluation of wine quality, that some respondents with low levels of knowledge and category experience found it very difficult to assess complex intrinsic cues, leaving them feeling somewhat 'intimidated' rather than confident of correctly evaluating different wine products. Therefore, the strongly supported belief that quality and price are linked leads to consumers using price to reduce the risk of a poor buying decision, such as the purchase of an inferior product or being socially embarrassed. Hence, finding a balance between desired quality and monetary sacrifice represents an important challenge to consumers (Kardes et al., 2004; Quester and Smart, 1998; Rao and Monroe, 1988; Rao and Olson, 1990; Snoj et al., 2004). The influence of price should not be considered infallible and, again as with other extrinsic cues, is moderated by the type and nature of other available product cues (both intrinsic and extrinsic) and consumer characteristics, such as product knowledge and experience (Bredahl, 2003; Glitsch, 2000; Verdú Jover et al., 2004; Monroe, 1976). However, in the absence of experience, knowledge or more reliable and interpretable information, price may be used as a primary surrogate indicator of quality.

C. *Influence of Extrinsic Cues on Sensory Perceptions*

Previous studies have demonstrated that extrinsic cues can be powerful enough to overcome sensory perceptions (Garber et al., 2000; Richardson et al., 1994). For example, Vranesevic and Stancec (2003) found that respondents evaluating branded tins of pâté believed a more prominent brand to be better quality than a non-branded offering. In a blind taste test, however, the premium brand of pâté was not actually preferred. Visual clues are also significant in consumer quality evaluations (Garber et al., 2000; Imram, 1999). Data from studies of consumer preferences in beef products indicate that consumers prefer the appearance of very lean and red steak, believing that these attributes contribute to a better tasting product. However, under blind taste testing conditions, these respondents prefer the taste and texture of meat that is darker in color (aged longer and more tender) and more marbled (higher fat content means the meat is juicier) (Bredahl, 2003; Glitsch, 2000; Hurling and Shepherd, 2003). In their experiment testing the influence of visual cues, Garber et al., (2000) found that respondents were less likely to correctly identify the taste of orange juice if tasting colorless samples, or samples of an incongruent color (e.g. purple). Further, in spite of all samples being identical in taste, those not orange in color were rated lower than samples of the expected hue. Therefore, research has confirmed that sensory perceptions are not always accurate and are vulnerable to expectations and beliefs. These findings provide compelling evidence that marketers cannot assume that intrinsic product attributes will be weighted and interpreted accurately when evaluated by consumers, even if the evaluation is through sensory means.

The influence of price (among selected other extrinsic cues) has been tested in previous studies using a variety of sensory evaluation methodologies, including taste tests and visual impressions (Hurling and Shepherd, 2003; Pechmann and Ratneshwar, 1992; Wansink et al., 2000). However, research testing the specific influence of COO and price on consumer opinions using the combined methodologies of taste testing and conjoint analysis is limited, representing an opportunity to expand our understanding of their respective value to consumers when all intrinsic cues are available for evaluation (Aaron et al., 1994; Acebron and Dopico, 2000; Becker, 2000; Hoffmann, 2000; Imram, 1999; Koch and Koch, 2003; Pechmann and Ratneshwar, 1992; Roper, 1969; Zellner and Durlach, 2003). Also, while previous studies often assumed intrinsic product differences (such as national vs. home brands or branded vs. unbranded products), this study quantifies differences in consumer perceptions of objective product quality due to the specific manipulation of a critical intrinsic product attribute. At the same time, the controlled manipulation of the extrinsic cues of price and COO allows the empirical assessment of both the relative importance, and most desired level, of each attribute tested. Therefore, the focal research question investigated in this research can be stated as: *"What is the relative importance of the extrinsic cues of COO and price to evaluations of product quality when sensory evaluations are employed?"*

II. Methodology

In order to assess the influence of country image and price on product assessment, in the presence of other important intrinsic attributes available for interpretation, it is necessary to ensure that respondents are exposed to these cues. This was achieved by using an experimental design where actual product consumption occurred of samples of a selected product with different COO and prices presented as extrinsic cues. The research incorporated both qualitative and qualitative components. Two focus groups were conducted as a means of confirming an appropriate product (wine) for testing and appropriate and varying country images for use in the quantitative components of the study. The quantitative stage of the study used full profile, conjoint analysis methodology to measure the respective influence of communicated extrinsic product cues on ratings of product quality, via a self-administered questionnaire. Respondents rated individual alternative product profiles where objective product quality was manipulated, often in conflict with the COO and price cues provided, to identify the cues that are most valued and which product attributes consumers were willing to 'trade off' to attain them. Respondents were also asked to indicate if they would consider purchasing each product tasted, thus allowing for an indication of their willingness to pay for each profile tested.

A. *Conjoint Analysis*

Conjoint analysis is a well established multivariate technique used to model how consumers make complex product assessment and purchase decisions (Hair et al., 1995). It is

based on the simple premise that consumers do not evaluate a product based on any single aspect. Rather, they evaluate a product offer overall in a holistic manner, by combining the separate amounts of 'utility' (value or attractiveness) provided by each product attribute level (Jaeger et al., 2000). In reality, the perfect product at the most desirable price rarely exists in the market place, but lesser, acceptable alternatives may. By using a conjoint analysis design, the relative importance consumers place on tested product attribute reveals those most that are the most highly valued and also those they will 'traded off' to achieve them (Hair et al., 1995). Importantly, the analysis method goes further and also reveals the desirability (or relative dislike) of the tested levels of each attribute in the design, for example, price level most willing to pay, product design considered most attractive or warranty level believed to provide the best value (Green and Srinivasan, 1978; Green and Srinivasan, 1990; Hair et al., 1995; Lee and Lou, 1996; Okechuku, 1994). A high degree of flexibility in conjoint analysis design permits respondents to consider a wide range of attribute combinations (product profiles) thus affording a high degree of market 'realism' within a controlled experimental design (Hair et al., 1995; SPSS-Inc, 1997). Also, respondent self-report bias and carry-over effect is minimized by presenting respondents with a set of choices without making explicit the fundamental attributes under study (Henderson and Reibstein, 1985). There are also few constraints in terms of attribute types that can be tested, allowing for metric, non metric and categorical variables, all at various levels (eg. differing product price points, colors, or distribution options). As long ago as the 1970s, thorough testing by McCollough and Best, (1979) concluded that conjoint estimates of consumer purchase behavior are both structurally and temporarily reliable.

Conjoint analysis design requires the researcher to determine a set of product attributes important to consumer product evaluations and then choose differing levels to test within each attribute. As discussed, the selection of credible product attributes and levels is critical to market realism and the subsequent external validity of results (Hair et al., 1995). Whilst the inclusion of all potentially influential attributes would describe a product more comprehensively, anything in excess of five or six attributes is argued to diminish the reliability of conjoint output (Green and Srinivasan, 1990). Green and Srinivasan (1990) also claim that the relative importance of an attribute is biased upwards as the number of levels on which it is defined increases. Accordingly, a maximum of four or five attributes, over three levels each, is suggested to provide an adequate description of the product and still maintain a manageable number of stimuli for respondents (Hair et al., 1995). Hence, the product used in this study was described along a set of two extrinsic attributes (price and country of origin) and one intrinsic variable (acid), with each attribute manipulated to three different levels.

Individual product profiles are formulated from a rotation of the attributes and levels. That is, determining a profile that reflects every possible combination of varying attribute levels. The task for respondents is to assess the resulting profiles according to the specific requirements of a given study. They may rate each profile individually, or rank them or choose from a specified set of two or more. The allocated score or ranking is a reflection

of the 'trading off' process; hence, higher scores are given to those profiles that include the most desirable attributes at the most preferred levels. Conversely, those product profiles given low scores, or rankings, will be comprised of attribute levels considered to be of little value or undesirable (Dean, 2004; Kupiec and Revell, 2001; SPSS-Inc, 1997). Analysis allows each respondent's preferences to be measured, yielding the 'importance' for each attribute, and the 'part-worth' or 'utility value' for each level. Consolidation of these results reveals which attributes are making the strongest contribution to opinions and which attribute levels are most and least preferred (Dean, 2004; Hair et al., 1995). Conjoint analysis assumes that any product or service can be 'decomposed' into its component attributes, and therefore, the perceived 'value' of this product to consumers is a sum of the utilities derived for the specific combination of attributes.

Therefore, the objective of conjoint analysis is to produce a set of additive part-worth utilities that use ratings given to product profiles to derive attribute utility scores. These are basically index numbers, corresponding to regression coefficients, measuring how valuable or desirable a particular feature is to the respondent (Curry, 1996; Dean, 2004). The Ordinary Least Squares Regression (OLS) approach to ratings based conjoint analysis is commonly used for this analysis as it offers a straightforward, yet robust method of deriving the different utility values (used to compute attribute part-worths) for each respondent (Hair et al., 1995). The OLS model computes utilities using a dummy matrix of independent variables where each indicates the presence or absence of an attribute level. The dependent variable is the respondent's score representing their assessment of the profile as described (Kupiec and Revell, 2001). The model is expressed as:

$$Z_i = f(y_{i1\,i2\ldots im}) = B_{1i1}(x_{1i1}) + B_{2i2}(x_{2i2}) + \ldots + B_{mim}(x_{mim}),$$

where
B = the beta weights estimated in the regression
x = the matrix of dummy values identifying the levels of the factorial design, and
y = the ranking or rating evaluations of the respondent.

Part-worth statistics (utility values) will be both positive and negative, expressed on a common scale summing to zero for each attribute and while utility values within an attribute may be compared; they may not be compared across attributes. Therefore, the most meaningful way to interpret the part-worths is to analyze the 'gaps' between utility levels within each attribute (Hair et al., 1995). A high range value (gap) between utility levels within an attribute indicates that the participants believe that change within that particular feature has significant impact on their overall assessment of that offer. Hence attributes with greater ranges are those used most by respondents to differentiate between profiles and have higher levels of relative importance in the rating (Hair et al., 1995; Kupiec and Revell, 2001). In order to compare the relative average importance of attributes importance scores (I) are calculated. This is done by taking the range between the lowest and highest utility value for an attribute (i) and dividing it by the sum of all the utility ranges (SPSS-Inc, 1997). Therefore importance is computed as:

$$I_i = \frac{(\max u_i - \min u_i)}{\sum(\max u_i - \min u_i)}$$

In summary, 'average importance' values reveal the comparative importance (in percentage terms) of each attribute to the respondent's decision and the utility values (part-worths) illustrate which attribute levels are preferred and those avoided (Hair et al., 1995; Kupiec and Revell, 2001). Further a score, or perceived 'worth', can be computed for each hypothetical product to determine which comprise the most importance attributes at the most attractive levels. This can be shown as:

$$\begin{aligned}\text{Total Worth for Product } ij \ldots n = {} & \text{part-worth of level}_i \text{ for factor1} + \\ & \text{part-worth of level}_j \text{ for factor2} + \ldots + \\ & \text{part-worth of level}_n \text{ for factor}_m\end{aligned}$$

B. *Definitions of Quality*

'Quality' has been defined in many different ways, and there are many different conceptual approaches to its measurement. A scientific approach to an objective quality definition and measurement relies on determining quality according to an exact technical specification, providing an objective assessment without the direct involvement of consumers (Grunert, 1997; Oude Ophuis and Van Trijp, 1995). In the area of food assessment, the International Organization of Standardization (IOS) provides a definition reliant on features and characteristics of a product or service, that affect its actual ability to satisfy stated or implied needs (Becker, 2000). This objective quality definition is appropriate when describing the manipulation of intrinsic product attribute that occurs as part of the experimental design in this research. This is due to the need to control and measure changes in actual product quality accurately (Gatchalian, 1999).

Conversely, the general philosophy in social research regarding quality definitions involves the provision of product characteristics that are perceived by consumers to meet their needs rather than an accurate reflection of objective product quality (Acebron and Dopico, 2000; Becker, 2000; Bredahl, 2003; Oude Ophuis and Van Trijp, 1995). The research adopts this form of consumer oriented definition of quality assessment as one based on consumer perceptions of overall quality, or product superiority, in comparison to alternative offers. This *perceived quality* approach results in a determination that is purely the result of a subjective judgment on the part of respondents and was a reflection of rating provided to products tested.

C. *Product Selection*

In order to use a general population sample for the quantitative stages of the research, it was necessary to select a food product routinely consumed by members of the

adult Australian population. Wine was identified as an example of this type of product (ScanTrack-Liquor, 2005). Interviews with industry product experts were conducted to select a wine variety that is readily available, commonly consumed by Australian shoppers and suitable for objective quality manipulation. Unwooded chardonnay was deemed a suitable wine due to its familiarity to consumers, and the fact that a single intrinsic cue (acidity) can easily and accurately be manipulated to produce significant differences in its objective product quality. Increasing the acid level in chardonnay wine produces sour wines (termed 'green') that are sharp and unpleasant on the palate (Baldy, 1993). The wine used in the experiments was sourced from a prominent wine producer in the McLaren Vale region of South Australia. All respondents tasted three manipulations of the same product, a 2005 vintage, unwooded chardonnay produced from fruit grown in three areas in South Australia: McLaren Vale (46%), Coonawarra (32%) and Padthaway (22%). A full description of the wine is included in appendix A.

D. *Qualitative Findings*

Two focus groups, of eight and ten consumers respectively, were conducted to confirm that Australian consumers believe that COO and price are important and predictive extrinsic cues influencing product quality for the selected wine product tested in the following stage. It was also necessary to identify which countries would be positively and negatively associated with the product, given that COO effect has been found to be product, country and market specific (Al-Sulaiti and Baker, 1998; Hastak and Hong, 1991; Insch and McBride, 2004; Kuusela et al., 1998). France is famous for producing a wide variety of high quality wines and is strongly and positively associated with this product. Therefore, France was expected to be considered by Australian respondents as a producer of high quality chardonnay (Verdú Jover et al., 2004; Keown and Casey, 1995). Conversely, countries such as Chile, South Africa and Canada are far less famous for producing high quality wines and are less likely to be associated positively with chardonnay for Australian consumers. Prior to inclusion, group members were screened to ensure they purchased and consumed wine at least once per fortnight.

Initial discussions in the two focus groups evolved around attributes (both intrinsic and extrinsic) respondents considered important when making a purchase. Data from the focus groups relevant to the types of extrinsic cues and their importance to the purchase decision were found to be largely consistent with the literature: COO and price both ranked very highly in their unprompted estimations of importance. Having established COO and price as viable extrinsic attributes for consideration, dialogue then progressed to potential source countries. France was cited most consistently as the likely source country for the highest quality wine. There was considerable debate and disagreement, however, amongst respondents deliberating where average and low quality products may be produced. Respondents found it hard to even a compose a strong country image for South American countries

such as Chile and Argentina and used what very little knowledge they possessed form an opinion of hypothetical products sourced from these locations (Han, 1989). Many believed all South American countries to be very poor and therefore incapable of producing high quality products (Chao, 1993). However, in contrast some respondents thought Chile and Argentina produced good wines, as they had 'read about them and heard they were good'. It was generally accepted that any tropical or Asian countries would make poor wine. The opinions relating to Canada and the U.S. varied from a belief that anything they produced would be at least 'average', through to an expectation that quality would suffer as products are likely to be 'mass produced', acceptable for manufactured goods, but perceived to have a negative impact on food and wine products (Chao, 2001). There also seemed to be a reasonable level of concern regarding pollution and pesticide levels affecting expected quality and product safety (Siu and Wong, 2002; Tse, 1999). Based on this qualitative stage, France was chosen as the country representing the highest quality wine, with the USA representing average quality and Chile poor quality.

E. *Conjoint Analysis Fractional Factorial Design*

While anywhere up to fifteen product profiles has been found feasible when respondents are assessing profiles only by description, sampling fifteen wines in one tasting session would be too onerous for participants for the sensory stage of the research. This is because it is difficult for participants to remain susceptible to the sensory differences in each sample due to potential desensitization of the palates. Also, they may experience fatigue due to the extended time involved in the tasks (Gatchalian, 1999). To reduce their burden, an orthogonal fractional factorial design reduced the number of profiles overall, whilst ensuring that an adequate representation of each attribute level was maintained to estimate a parameter of main effect of each attribute and level (Kupiec and Revell, 2001; Rao and Hauser, 2004; SPSS-Inc, 1997). The full factorial design based on a three country × three price level × three acid specification results in twenty seven possible product profiles for each product. By adopting a fractional factorial design this number was reduced to a subset of nine hypothetical product profiles (specific attribute level combinations), from which it is possible to test the part worth contribution of each respective attribute level (Hair et al., 1995; SPSS-Inc, 1997). Objective product quality was diminished by manipulating acidity levels: highest quality wine was left untreated, average and low quality was achieved by the addition of 0.5 gram and 1.0 gram of tartaric acid per liter respectively. Paired sample testing and triangle testing results confirmed that the differing levels of acid were readily discernable and that the untreated wine was considered to be high quality (good tasting), and the wine was found to taste progressively worse as acid levels were increased. Examples of descriptions from respondents tasting the chardonnay with the highest level of acid include 'foul', 'sour!', 'like vinegar'. Table 1 illustrates the attributes and levels incorporated in the experimental design.

Table 1
Specification of Wine Attributes and Levels

Attribute	*Cue Type*	*Levels*
Country of Origin	extrinsic	France USA Chile
Price (per 750 ml bottle AUSD)	extrinsic	$53.00 $16.00 $ 6.00
Acid level	intrinsic	Untreated + 0.5 gram tartaric acid per liter + 1.0 gram tartaric acid per liter

Figure 1
Example of wine product profile

Chardonnay 823

Produced in France

Retail Price $53.00

Low Quality									High Quality
1	2	3	4	5	6	7	8	9	10
□	□	□	□	□	□	□	□	□	□

Would you consider buying this product? Yes □ No □

This design was translated into a self-administered questionnaire based on nine individual product profiles and the addition of two 'hold out' profiles to be completed by respondents first as a 'warm up' exercise as recommended by previous research (Louviere, 1988). Each profile was allocated a random, but unique, identifying number and shown individually on its own page of the questionnaire, and assessed by respondents using a ten point scale anchored with 'low quality' represented by the lowest score and 'high quality' represented by the highest score. Whilst the specific extrinsic cue levels of price and COO were provided in each profile description, the intrinsic cue of acid level was not, ensuring that the influence of this cue would be evaluated according to sensory experience. After rating each sample according perception of quality, respondents were asked to indicate whether or not they would consider purchasing the chardonnay as described, thus also capturing an indication of their perceptions of the total value represented by each profile and their willingness to pay for it. Figure 1 shows a sample product profile.

F. *Conducting the Experiment*

A convenience sample of 263 respondents from the general population, aged 18 years or older, was determined by drawing upon a variety of sources within the metropolitan area of Adelaide, South Australia. Recruitment locations included randomly chosen public events and recreational clubs. To support these efforts, electronic invitations were also broadcast to all staff of a large South Australian government organisation. In order to increase participation a $30 cash incentive was offered to potential respondents via an information pack that also included an acceptance and registration form. Respondents could choose to attend the experiment at a time most convenient for them from the provided schedule of planned tasting sessions that would be conducted over a one month time frame. As registration forms were returned, the researchers noted important demographic details provided on the forms such as gender and age. This information was collected from all potential participants, and used to ensure that a gender balance in the sample was achieved that closely reflected that of the Australian general population. Care was also taken to attempt a similarly appropriate spread of age ranges and whilst the final sample did exhibit some age range differences to the general population, these were not expected to adversely limit data analysis results.

Typically each testing day, over 275 samples of chardonnay were prepared and tasted. The sensory laboratory used consisted of nine individual tasting booths, with the capacity to accommodate one or two additional respondents in the preparation area if required. Each session was approximately two hours in duration and included between four and eleven participants. In order to maintain consistency in wine samples, wine trays for each respondent were prepared to minimize time in the glasses. Each glass holding a sample was covered with a close fitting lid and trays were stored in a refrigerated room until just prior to respondents entering the tasting booths. Each respondent sat in an individual tasting booth and signaled their readiness for a sample by using a switch inside the booth. The switch illuminated a light in the kitchen preparation area specific to that tasting booth and by sliding a small door open at counter height, a new sample was swapped for the empty glass that held the previous sample. To overcome any expectations by respondents that wines may differ in color, yellow lighting designed specifically to neutralize these types of product color variations was used. A tasting schedule posted over each booth ensured that wine samples were presented in the correct order.

III. Results

Table 2 shows the 'average importance' of chardonnay attributes tested and the individual average 'utility values' derived for each attribute level. As found in pre-testing, respondents were able to discriminate between levels of objective quality and to rank the acid levels appropriately. The untreated wine was found to most desirable in taste with a positive

utility value of 0.1187 as compared to the wine of heightened acidy with a utility value of 0.0908, and both these levels were considered comparatively and significantly superior to the highly acid wine showing a negative utility value of -0.2095. As an attribute, however, acid level only exerted a 13.10% influence to the overall rating given for quality, with the balance of importance weighted to COO and Price. France was believed to provide the highest quality chardonnay with a comparatively high and positive utility value of 0.2396, with surprisingly little difference found between the somewhat negative perceptions of both the U.S. and Chile. However, while both extrinsic cues were found to be more influential in affecting quality perceptions than experienced acidity, the 'average importance' of price to respondents dominated over the other product cues. These results relating to wine price levels are consistent with the literature, showing that a particularly low price is likely to be associated with correspondingly low quality, and conversely, a high price with higher quality (Verdú Jover et al., 2004; Zeithaml, 1988). The comparative utility values of the three price levels tested illustrate clearly the likely challenge for any marketer aiming to establish even a modest quality position for a low cost wine product. Table 3 illustrates the minimum, maximum and average total 'utility values' of each sample profile tested. These are sorted from the product profile deemed, on average, to be the most preferred to the least. These average profile utility values are computed from the sum of a positive constant term and the respective attribute level utilities shown in Table 2 specific to each profile, hence those profiles that combine the most positive attribute levels achieve higher average utility scores. The powerful influence of price on perceptions of taste is clear with profiles ranked first by price, then by the combination of price and COO/taste.

Table 2
Summary of Average Attribute Importance and Utilities

Attribute	*Ave importance to rating*	*Level*	*Utility value*
		France	0.2396
COO	15.08 %	U.S.	-0.1014
		Chile	-0.1383
		$53.00	0.9177
Price	71.81 %	$16.00	-0.0365
		$ 6.00	-0.8831
		Average	0.1187
Acid	13.10 %	Above average	0.0908
		High	-0.2095
Kendall's tau	1.000 Sig. 0.000		
Pearson's r	0.998 Sig. 0.000		N = 263

Table 3
Average Utility Values per Wine Profile
N = 263

Profile	*Attribute levels*			*Min*	*Max*	*Mean*	*SD*
823	France	$53.00	Untreated	1.22	10.89	7.09	1.98
924	Chile	$53.00	+ 0.5 gram acid	0.89	10.89	6.69	1.93
279	U.S.	$53.00	+ 1.0 gram acid	0.00	10.56	6.49	1.92
253	France	$16.00	Untreated	0.89	10.33	6.07	1.76
950	France	$16.00	+ 0.5 gram acid	0.22	10.44	5.96	1.91
595	U.S.	$16.00	Untreated	0.89	9.67	5.79	1.77
481	Chile	$16.00	+ 1.0 gram acid	0.33	9.11	5.43	1.71
582	U.S.	$ 6.00	Untreated	−1.00	11.00	5.02	1.97
494	Chile	$ 6.00	Untreated	0.00	11.11	4.98	1.97
696	France	$ 6.00	+ 1.0 gram acid	−0.22	10.11	4.96	1.90
152	U.S.	$ 6.00	+ 0.5 gram acid	−0.11	10.78	4.92	2.08

Table 4
Average Wine Profile Values by Purchase Intentions

	Yes		*No*		*Mann*		
Profile	*Mean*	*SD*	*Mean*	*SD*	*Whitney U*	*Z*	*Sig.*
253	6.08	1.17	6.03	1.11	7866.00	−0.06	.947
582	5.36	1.75	4.80	2.08	6893.00	−2.14	.032
481	6.52	1.32	4.69	1.55	3103.00	−8.89	.000
696	6.20	1.47	3.79	1.47	2116.00	−10.53	.000
595	6.88	1.19	4.74	1.55	2301.00	−10.19	.000
924	7.85	1.07	6.15	1.99	3596.00	−6.78	.000
152	6.42	1.42	3.54	1.56	1533.50	−11.48	.000
823	8.12	1.29	6.49	2.02	4139.50	−6.67	.000
494	6.16	1.63	3.81	1.54	2470.00	−9.91	.000
950	7.06	1.39	4.70	1.61	2180.00	−10.26	.000
279	7.50	1.27	6.09	1.94	4143.50	−5.60	.000

N = 263

Table 4 shows the average utility value for each profile, segmented by those that would consider buying the product tasted and those that would not. This analysis was done to investigate the connection between opinions of quality and likelihood of purchase. With the exception of the first profile, there are significant differences between the mean scores according to purchase intention, suggesting that the assessment of quality is positively linked to likelihood of purchase and, hence, willingness to pay. Those participants who considered the samples to be of higher quality were more likely to consider buying the product than those who did not. These findings are also consistent with the literature and expectations (Zeithaml, 1988). Given that the extrinsic cues used in our study largely overpowered taste, this exploratory analysis has significant potential implications for the marketing of wine products.

IV. Conclusions

Consumers have been found in previous research to consistently rely on the extrinsic cues provided as surrogate indicators of quality, particularly when there is little other specific and reliable information available for them to consider. In the case of the sensory experiments, reliance on the extrinsic cues tested was found to remain extremely robust even when all intrinsic cues were available (through sensory experience) for respondent evaluation. In fact, the influence of price and COO was found so powerful as to overwhelm even the taste of poor wine. These results are particularly compelling given that the use of full profile conjoint analysis design has been found to heighten respondent scrutiny of individual product attribute levels, above that likely to be exhibited in normal consumption (Huber, 1997). The use of a laboratory environment for product taste testing has also been found to exert similar effects (Van Trijp and Schifferstein, 1995). Therefore, in the market place where the objective quality between products is often comparable, and consumers may be less sensitive to variations in intrinsic product attributes, the influence of extrinsic cues may be even more critical to consumer quality assessment.

As with other experimental studies, our research presents a number of other limitations. Our sample, although representative of a wide cross section of the population, remains one of convenience, which limits our ability to generalize results. In reality also, products and services are comprised of a combination of hundreds (perhaps thousands) of intrinsic and extrinsic cues and the methodology only allows the researcher to test a few (Curry, 1996; Hair et al., 1995). The choice of those attributes and levels most critical to the quality evaluation and/or the buying decision is therefore of paramount importance (Jaeger et al., 2000). However, our careful scrutiny of the existing literature, and analysis of data derived from preliminary focus groups suggest that that our choice of extrinsic cues and levels reflected realistic and important attributes in consumers' evaluation of wine products. As such, our study should deliver a cautionary message to wine marketers and others who may overestimate the importance of intrinsic cues over that exerted by extrinsic ones.

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Appendix A.

Product information provided by winemaker and producer

Tasting Notes and Winemakers Comments - 2005 Unwooded Chardonnay

The fifteenth vintage of Chapel Hill's Unwooded Chardonnay was produced from fruit grown in South Australia's most acclaimed Chardonnay regions: McLaren Vale, Coonawarra and Padthaway. These three regions exemplify Chardonnay's invigorating flavour spectrum. They each contribute contrasting varietal flavours that mingle effortlessly to culminate in a wine of delicious texture and sublime depth of flavour.

The 2005 vintage growing season was characterized by extended dry periods coupled with moderate temperatures and modest cropping levels. Additionally, the lack of any extended hot spells resulted in minimal sunburn of the fruit and excellent vine health and balance. This ensured that, even though harvest was earlier than average, the grapes displayed definitive varietal character as they achieved optimum fruit ripeness.

The 2005 Unwooded Chardonnay is a lively wine that displays multiple fruit layers such as passionfruit, melon & white peach. It is full flavoured with a lingering citrus blossom finish. The Unwooded Chardonnay is now bottled under screw cap to protect freshness and increase its ageing potential. As a young wine, it's a lively aperitif style well suited to seafood, light summery dishes with a touch of citrus flavour and lightly spiced Asian dishes. Following the pattern of previous releases, bottle ageing will give graceful development of buttered toast characters and richness that will accompany more strongly flavoured food.

Appellation: McLaren Vale (46%), Coonawarra (32%), Padthaway (22%)

Harvest Date: February/March 2005

Sugar at Harvest: 12.5 to 13.5o Baume

Fermentation: Cold pressed
Free run racked
Cool fermented in tank.

Acidity: 7.0 g/L

Alcohol: 13.0 % v/v

Residual Sugar: 3.7 g/L

Barrel Ageing: nil

Bottling Date: 14/6/2005

Release Date: June 2005