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Expensive and colour intensive –are these the factors of success? A hedonic liking model using the example of red wine

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Abstract

The main aim of this study was to analyse the influence of different extrinsic cues using red wine. A hedonic analysis was conducted to identify and quantify the influence of price, colour intensity and other verbal and non-verbal information on the buying decision as well as on the taste perception of consumers. This test verified that higher priced and colour intensive red wines were better evaluated even though the taste of the wine did not change. In this case however, the influence of the quality indicators proved to be different according to the consumer segments.

Keywords: price, colour, red wine, consumer behaviour, extrinsic cues

Introduction and literature review

There is simply too much information which we face while buying a bottle of wine (Bernd, 1983). This huge amount of information can confuse the consumer who tries to avoid a very complicated and time intensive decision and to simplify the product evaluation standing in front of a shelf of wine. During simplification of the buying decision consumers are looking for indicators which help to qualify the good. These so-called quality indicators are responsible for the success or even for the failure of a product (Szolnoki et al., 2008).

Price as a well comparable characteristic of different products is always available for consumers. Even if they don´t know the brand name or have never heard of the region or grape variety, the price is used to say something about the product (Armstrong & Kotler, 2002). We assume that less involved consumers with little knowledge about wine use price as one of the most important quality indicators while frequent wine drinkers or highly involved consumers have a completely different evaluation approach.

Lots of hedonic papers have already investigated the influence of different factors –mostly extrinsic factors like country or region of origin, grape variety etc. – on price. Oczkowski (1994) and Schamel and Anderson (2003) used a huge amount of region of origin coded as dummy variable, while Nerlove (1995) and Combris, Lecocq, Visser (1997) also analyzed the impact of intrinsic factors like sugar and alcohol content, acidity etc. Steiner (2004) concentrated on French wines and used region of origin, colour, vintage, quality category and grape variety as independent variables. Costanigro (2007) dealt not only with variables of origin, vintage, quality scores, grape variety and producers but also some label information.

These above-mentioned studies are all based on so-called scanner data collected from different selling statistics or rating scores of wine magazines. On the other hand – because of the objective of these analyses – none of them explored whether price and/or colour intensity could have any influence on the liking of the wine and willingness to buy it.

Veale and Quester (2008) conducted a conjoint analysis with extrinsic and intrinsic attributes. Among the attributes country of origin, price and acid level, price with an average importance of 72% turned out to be the strongest factor influencing the consumer evaluation of wine quality.

Goldstein et al. (2008) combined a hedonic analysis with a sensory test in the framework of a blind tasting of 6000 wines. The findings suggest that non-expert wine consumers do not prefer expensive wines or wines appreciated by experts more. However, this study showed the quality evaluation of laymen in a situation where additional information about the wine was hidden.

We constructed a model combined with tasting which proves and quantifies the influence of price, colour intensity and other extrinsic factors on the liking and willingness to buy.

Methodology and model estimation

In the framework of this study a hedonic analysis was conducted which permits the analysis of the individual attributes of a product (Hermann und Homburg, 2000). Following the so-called hedonic pricing model this method is generally based on a regression analysis which measures the influence of product attributes on the price (Combris, Lecocq and Visser, 1997), however in this model liking and willingness to buy were taken as dependent variables.

As shown in the literature overview no analyses have previously investigated the influence of price and colour intensity on the liking and willingness to buy based not on a secondary data but on a simulated real buying process including tasting the wine.

The pretence of the tasting was that the respondents got the same wine in four different wine bottles with different information on the label (the same wine presented in 4 different bottles). This was on the one hand a limitation because taste difference cannot be evaluated but on the other hand this kind of test allowed us to quantify and compare the influence of selected extrinsic and intrinsic factors.

In order to avoid a direct survey (see Müller 2006; Szolnoki 2007), a wine tasting was conducted within a central location test with 323 German wine consumers. The test happened in April 2008 in Berlin. We modelled a buying situation by defining some of the preliminary decisions for the interviewees: "Put yourself in the situation that you are looking for a good dry wine to enjoy over dinner tonight with friends". The buying motive, the place to buy and the flavour of the wine were defined, so that we reduced the influence of the preliminary decisions – except price and colour intensity – to zero.

The test wine (2006 Schwarzriesling, Weinsberg) was prepared with two different colour intensities: a light-coloured and a colour intensive version. However the last one was dyed with taste neutral colourant – an analytical test with photometer proofed the significant difference between colour intensity intensive and light. The respondents tasted the same wine in different bottles 4 times, with different extrinsic factors on the label, with different colour intensity and with different prices (Table 1).

Table 1: 4 different bottles for the tasting

	Origin	**Grape Variety**	**Brand name**	**Colour intensity**	**Price**
1)	Germany/Rheingau	Pinot Noir	A	intensive	5.99 €
2)	Germany/Baden	Spätburgunder	B	light	2.99 €
3)	France/Bordeaux	Cuvée	C	light	5.99 €
4)	Australia/South Aust.	Cabernet-Merlot	D	intensive	9.99 €

The respondents evaluated the packaging, the region of origin, the grape variety, the brand name, the colour intensity on a 1-to7- scale, then tasted the wine and gave their opinion about the liking, the price acceptance and afterwards the willingness to buy any of the test wine again on a 1-to-7 scale.

A two-stage recursive model was developed without any interaction between dependent and independent variables:

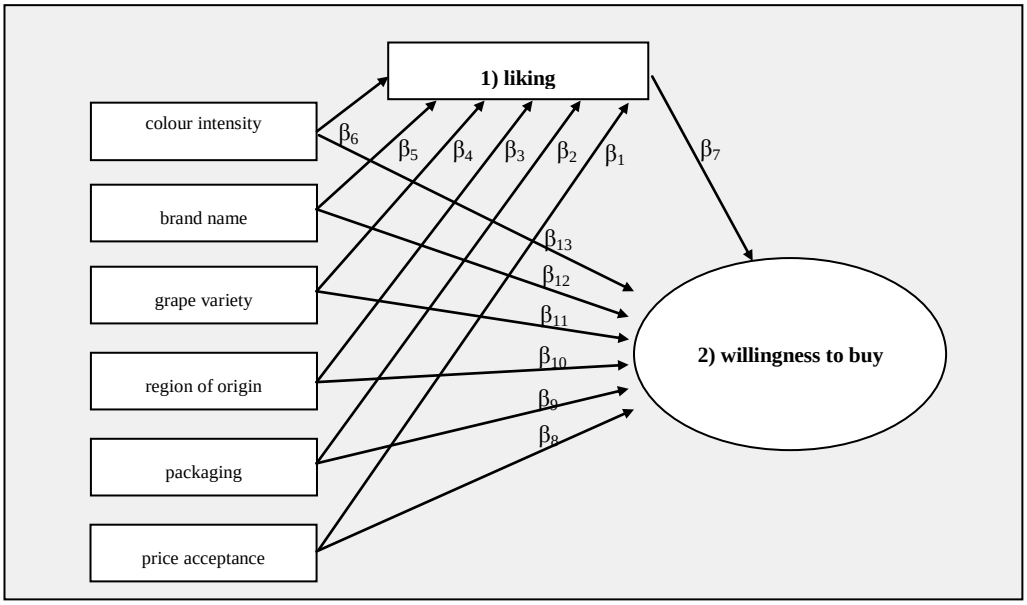
(1) liking = f (packaging, origin, grape variety, brand name, colour, price)

(2) willingness to buy = g (liking, packaging, origin, grape variety, brand name, colour, price)

In the first stage, the consumers´ liking and in the second stage the willingness to buy were examined as dependent variables. On the right side of the first equal packaging, region of origin, grape variety, brand name, colour intensity and price acceptance stay while in the second equal liking, packaging, region of origin, grape variety, brand name, colour and price acceptance were used as independent variables. Figure 1 shows the relation of the two equals as a recursive model.

The model was estimated using seemingly unrelated regression (SUR) to calculate the two equals simultaneously. The estimate was based on the examination of attributes of 323 respondents. The data of the test wines was put together and examined as a whole (cumulative examination, n=1292). This kind of examination resulted in a better adjusted R-Square.

Figure 1: Relation of the two equals (recursive model)



Results

While analysing the descriptive statistic significant differences were reported. Even the liking was evaluated differently although it was the same wine. This fact testified that there are factors which can cause a visual influence. As the descriptive statistic shows the liking was evaluated according to the price – the higher the price the better the liking (Table 2). Medium priced wines were selected as a best willingness to buy solution (wine A and C).

Table 2: Descriptive statistic of the test wines

	packaging	origin	grape var.	brand	liking	colour	price accept.	willingness to buy
wine A	4.9	4.7	4.7	4.4	4.5	5.2	4.3	4.0
wine B	3.8	4.5	4.8	3.9	3.7	3.2	5.3	3.5
wine C	5.6	5.6	5.2	5.2	4.6	3.5	4.3	4.1
wine D	4.0	4.4	4.8	4.1	4.9	5.8	3.5	3.7

The seemingly unrelated regression comprises two evaluations. The first one tests the importance of the influencing factors of packaging, origin, grape variety, brand, colour intensity and price.

Table 3 shows that colour intensity (0,357) and price (0,373) are the strongest factors to modify the liking of the wine. Other significant factors like packaging, grape variety or brand have a lower influence, while origin surprisingly has become insignificant.

Table 3: The results of the SUR estimation of the first equal

Dependent variable: liking				
Independent variables:	**Unstand. Coefficient**		**Stand. Coeff.**	
	B	**Standard error**	**Beta**	**Sig.**
(Constant)	-0.238	0.215		0.268
Packaging	0.050	0.026	0.052	**0.056***
Origin	0.052	0.039	0.040	0.180
Grape var.	0.070	0.041	0.047	**0.088***
Brand	0.150	0.036	0.121	**0.000*****
Colour int.	0.357	0.022	0.364	**0.000*****
Price acceptance	0.373	0.024	0.364	**0.000*****
	adjusted R^2 = 0.346	n = 1292		

Significance: ***99%, **95%, *90%

In the next step the influence on willingness to buy was analysed. Table 4 contains the results of the second evaluation. Except for two variables (origin and grape variety) all of the factors included in the model are significant at p=0.05.

Table 4: The results of the SUR estimation of the first equal

Dependent variable: willingness to buy				
	Unstand. Coefficients		**Stand. Coeff.**	
Independent variables:	**B**	**Standard error**	**Beta**	**Sig.**
(Constant)	-1.594	0.193		**0.000*****
Packaging	0.073	0.024	0.065	**0.002*****
Origin	-0.019	0.035	-0.013	0.580
Grape var.	-0.017	0.037	-0.010	0.647
Brand	0.122	0.033	0.084	**0.000*****
Colour	0.066	0.022	0.058	**0.002*****
Price acceptance	0.432	0.023	0.360	**0.000*****
Liking	0.586	0.025	0.500	**0.000*****
	adjusted R^2 = 0.618	n = 1292		

Significance: ***99%, **95%, *90%

Similar to other studies (Hübinger 2006, Szolnoki 2007) liking has the highest influence (0.586) on the willingness to buy. Interestingly, the proportion of price acceptance and liking is not the usual 1:2, but here price plays a more important role. This was probably caused by the different price levels the participants faced during the test. Apparently, origin and grape variety lose their importance as soon as bigger price differences and intrinsic parameters come into view.

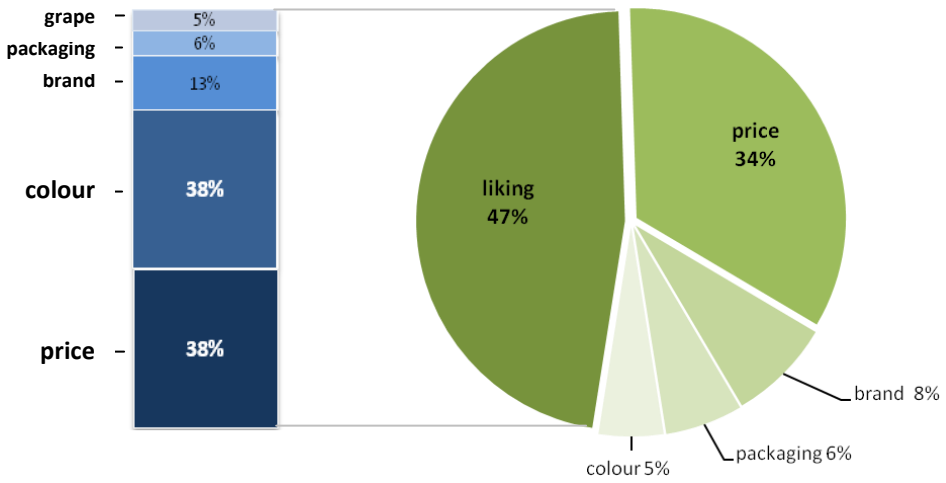
Conclusion

Analysing the influence of different extrinsic and intrinsic factors based on a primary data collection of tasting we found that price and colour intensity are by far the most important

factors which can influence the quality evaluation of wines by non-expert consumers. A two-stage experiment was conducted to prove and quantify the importance of variables with help of regression analysis.

Figure 2 shows the connection between the two equals: the left side describes the influence of the variables on the liking while the right side demonstrates which variables play an important or insignificant role for the willingness to buy.

Figure 2: Relative importance of extrinsic and intrinsic attributes



This result signals a high influence of factors which belong to the so-called preliminary consumer decisions*. Former studies (Szolnoki 2008) have already proven that during a test with factors of only POS-decisions consumers focus more e.g. on packaging or brand name. As soon as preliminary factors are excluded in the study, extrinsic variables like packaging, brand, grape variety and origin are of minor importance. This fact testifies the higher influence potential of factors which belong to the preliminary decisions.

Furthermore, it can be stated that the influence of price and colour is in correlation to customer segmentation. A segment-specific regression examination was conducted and three groups of consumers can be distinguished by means of this influence: 1) Mainstream with the highest influence of price and packaging; 2) older experienced, who base their liking more on colour intensity and origin; 3) younger inexperienced, for whom all factors are of importance except the origin.

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* There is a difference between preliminary decisions and decisions at the point of sale (POS). If it is not an impulse buy the consumer decides first of all about the occasion and parallel to this about an approximate price class. The first two decisions determine also the place to buy the wine (discounter, supermarket, specialized trade or direct at the winery) followed by the colour and the taste of the wine. By fixing these factors the circle of the potential wines will be limited. At the point of sale there is some latent and evident information for an external search. Evident information is observable for the consumer, but latent information and its influence stays hidden during the decision (Ellinger, 1966). Written information like origin, variety, brand name or vintage belongs to the evident/verbal information while design (design is the effect of components of the packaging) belongs to the latent/non-verbal factors (Szolnoki 2007).

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