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Title
The attention seeking and value expectations of wine label designs: an eye tracking experiment

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Conference Presentation

Corresponding Author
Philipp Piroth

E-Mail
philipp.piroth@hs-lu.de

Affiliation
University of Applied Sciences Ludwigshafen, Germany

Co-Author/s

Name	E-Mail	Affiliation
Peter Merdian	peter.merdian@hs-lu.de	University of Applied Sciences Ludwigshafen, Germany
Gerhard Raab	raab@hs-lu.de	University of Applied Sciences Ludwigshafen, Germany
Edith Rüger-Muck	edith.rueger-muck@hs-lu.de	University of Applied Sciences Ludwigshafen, Germany

Keywords
wine-label design, eye-tracking, attention

Research Question
Can attention distribution predict interest and estimated value in wine label designs?

Methods
We conducted eye-tracking measurement on eye movement behaviour and ANOVA and regression analysis on the relationship between attention and interest as well as estimated value.

Results
We found signficiant effects between total fixation duration and stated interest and interest and estimated value.

Abstract
Purpose

When it comes to buying wine, consumers often make decisions out of uncertainty. Wine as a beverage offers great benefit in taste, however the benefit only reveals itself once the bottle is already open. Consumers therefore base their decision on personal experience and available information (such as price, country of origin, etc.) that characterize the product and arouses a certain expectation. However, one of the most important decision-making criteria is the design of the bottle and specifically the wine label. The wine label therefore may work as a gatekeeper determining the effort a consumer is willing to invest in further information gathering on the wine. On the virtual and real world shelves, bottles are in a competition of attention that has to be won first, especially in relation to the scant attention that consumers bring up when browsing over the shelves. Wine merchants and producers are increasingly recognizing the importance of wine label design. This study examines the relationship

between the distribution of attention and cognitive processes during the observation of several wines, and illustrates the links with expressed interest and expected value of a wine. The aim of the study is to show whether attention only increases interest, or whether it can positively influence perceived value, across several label design categories.

Study design

This study examines the relationships between the distribution of attention towards several wine labels and the evaluations expressed by the respondents with regard to their individual interest and value. The distribution of attention is implicitly measured by an eye-tracking device, and it is examined how quickly the respective wine labels were seen and how long consumers fixated on the label. N=37 participants took part each providing a rating to a total of eight bottles of red and white wine in terms of interest and estimated value within four wine label designs (see illustration 1). The four categories can be described as (1) minimalistic, (2) themed, (3) standard and (4) classic. An overview of the used wine label designs can be found in appendix 1.

At the beginning of each experiment the respondents had no indication that the presented wine label designs should be evaluated afterwards. With this proceeding, the study can ensure that the implicit recordings of the eye tracking took place completely unbiased. During the experiment, participants had the opportunity to ask questions. The study was conducted on the facilities on a wine research institute in Rhineland-Palatinate. All participants were calibrated with a nine dot grid on the screen, more than five failing attempts led to an exclusion.
The study was powered with the software Tobii Studio 3.3.2 and conducted with the eye-tracking device Tobii X120 placed with an optimal distance of 60 cm (23.62 inches) to the screen. The participants were sat on a table and only had a PC mouse available for interaction. The eye-tracking device was located below the screen with a resolution of 1280x1024 pixel. A 17'' monitor was fixated on a second table to remove micro vibrations caused by the user's hardware peripheries.
The sequence of the stimuli was first an overview of all eight bottles, in which the distance between the wine label designs was sufficiently large to include the area of interests with a systematic measurement error. The participants subsequently saw an overview of the four red wines of each price category, followed by an overview of the four white wines. After viewing the overviews, a bottle was shown in close-up, which was then evaluated with a five-point-Likert scale on the subjective interest and the estimated value towards each label design. The arrangement of the bottles was randomised and changed with each consecutive run of the experiment. Relevant socio-demographic variables were evaluated subsequently within an interview. This study set its focus on the following hypotheses (see illustration 2):

H1. The lower the Time to First Fixation (TTF), the higher the expressed interest.
H2. The higher the Total Fixation Duration (TFD), the higher the expressed interest
H3. The lower the Time to First Fixation (TTF), the higher the expressed value.
H4. The higher the Total Fixation Duration (TFD), the higher the expressed value.
H5. Expressed Interest is a predictor for assumed value.

Findings

For our analysis we conducted analysis of variance (ANOVA) and regression analysis. Table 1 lists the descriptive statistics of both interest and estimated value as well as the eye-tracking measurement data while table 2 illustrates regression functions and the results of the hypotheses. All analyses were conducted using base and psych functions in R.
We found that the measured implicit data show that the distribution of attention had a significant effect on the evaluation of interest ($p=.02$; $R^2=.01$). Unsurprisingly the determination coefficient is fairly low. This may be due to measurement restrictions and the overall low explanation power of eye movement behaviour. Nonetheless the effect remains significant hinting at the existence of said effect.
The longer a person has looked at a bottle, the higher the subsequent assessment of interest. Due to lack of significance, this statement cannot be applied to the variable value, nor can the other eye tracking data (TFF) confirm the hypotheses. The stated interest is a qualified predictor for the expressed value in this experiment as it shows a significant effect ($p<.001$; $R^2=.47$). ANOVA calculations determined that mean performance levels showed

a statistically significant difference between ratings for variable value $F_{(3, 588)}=72.65$, $p<.001$, partial $\eta^2 = .15$ and interest $F_{(3, 588)}=5.72$, $p<.001$. The variances for variable TFD $F_{(3, 567)}=1.21$, $p=.31$ and variable TFF $F_{(3, 471)}=2.230$, $p=.084$ are not significant. ANOVAs reveal significant differences between the four product groups for the dependent variables value and interest. In terms of eye-tracking measurement only the relationship between interest and TFD was significant, while none of the other measures showed any significant effect.

Conclusion

H1 and H5 were supported, while hypotheses 2, 3, and 4 were rejected. The duration of the attention that a person addresses to a bottle has a significant influence on the interest expressed. This influence is rather unconscious and relatively small, but present. This cannot be transferred to the speed at which a bottle is first seen. There were no significant correlations to be found. A similar relationship can be found between the variable TFD, TFF and the evaluated value - as there were no connections to be found, which have validity beyond the coincidence. The interest of a person is suitable as a good predictor for determining the estimated value. The analysis of variance between the four product categories reveal, wines with a modern design have generally received less interest and at the same time lower average values. This difference is significant. This does not apply to the implicit values, where there were no significant differences between the product groups.

Practical implications

This study showed that the enhancement of the effectiveness and therefore the goal of the cognitive processes in the brain is important for the evaluation of the interest of a wine. The interest is a condition for the further perception of a product and significantly influences the value attributed to a bottle. Wine merchants and producers must therefore pay close attention to the fact that the bottle is seen as long as possible, for example through better placement on the offline sales shelf or a larger product image in the virtual shop. In order to increase the value and thus the price of a bottle, activities should be taken into account that can further increase interest. At the same time, there are apparently prejudices against modern wine label designs that approach a theme. Wine drinkers perceive these products as less interesting and describe them to be of lower worth. These wines however occupy a niche for younger, less wine enthusiastic consumers. People who feel addressed by modern wine label designs do not share these prejudices, which is why they rightly have a place on the shelves.

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Philipp Piroth
University of Applied Sciences Ludwigshafen, Germany
philipp.piroth@hs-lu.de

Peter Merdian
University of Applied Sciences Ludwigshafen, Germany
peter.merdian@hs-lu.de

Gerhard Raab
University of Applied Sciences Ludwigshafen, Germany
raab@hs-lu.de

Edith Rueger-Muck
University of Applied Sciences Ludwigshafen, Germany
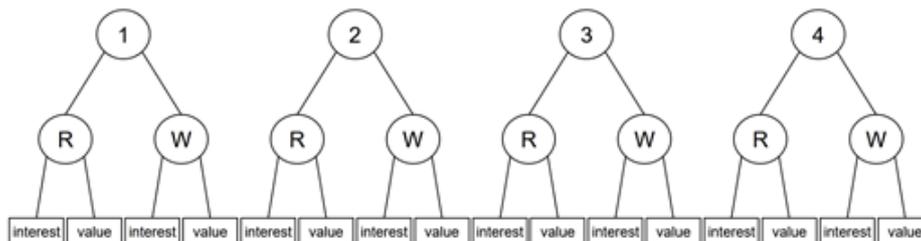edith.rueger-muck@hs-lu.de

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*Illustration 1. Stimuli set-up of the experiment*

At the beginning of each experiment the respondents had no indication that the presented wine label designs should be evaluated afterwards. With this proceeding, the study can ensure that the implicit recordings of the eye tracking took place completely unbiased. During the experiment, participants had the opportunity to ask questions. The study was conducted on the facilities on a wine research institute in Rhineland-Palatinate. All participants were calibrated with a nine dot grid on the screen, more than five failing attempts led to an exclusion. The study was powered with the software Tobii Studio 3.3.2 and conducted with the eye-tracking device Tobii X120 placed with an optimal distance of 60 cm (23.62 inches) to the screen. The participants were sat on a table and only had a PC mouse available for interaction. The eye-tracking device was located below the screen with a resolution of 1280x1024 pixel. A 17'' monitor was fixated on a second table to remove micro vibrations caused by the user's hardware peripheries.

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Illustration 2. Construct of Hypotheses
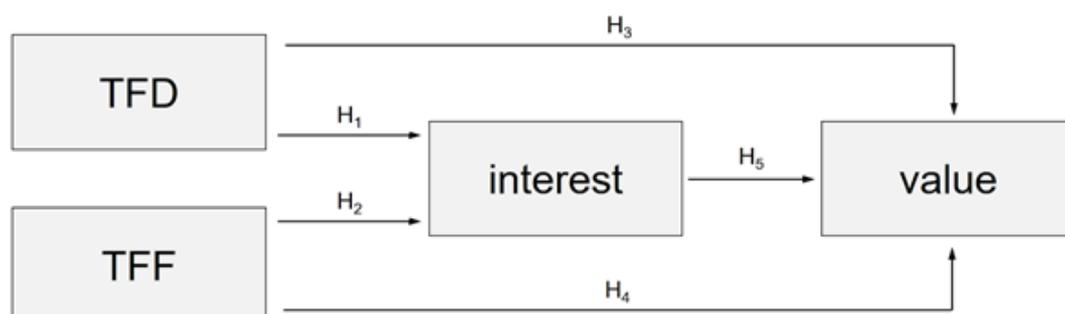
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Table 1. Mean values and sd for value and interest and eye-tracking measures in all wine label design categories

Wine label design category	value		interest		TFD in millisec.		TFF in millisec.	
	m	*sd*	*m*	*sd*	*m*	*sd*	*m*	*sd*
minimalistic	3.27	0.60	3.11	0.88	1,373.47	743.64	3,060.38	2,745.27
themed	2.50	0.72	2.16	0.98	1,506.89	751.13	2,655.83	2,330.09
standard	3.59	0.68	3.38	0.82	1,520.84	862.68	2,505.13	2,234.74
classic	3.46	0.78	2.99	0.90	1,561.26	912.49	2,395.35	1,897.73

We found that the measured implicit data show that the distribution of attention had a significant effect on the evaluation of interest (p=.02; R^2=.01). Unsurprisingly the determination coefficient is fairly low. This may be due to measurement restrictions and the overall low explanation power of eye movement behaviour. Nonetheless the effect remains significant hinting at the existence of said effect.

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Table 2. Regression, p-values and result of hypotheses

Hypothesis	Regression	p	R²	result
H1	interest = 2.74 + TFD * 0.114	0.02	0.01	supported
H2	interest = 2.86 - TFF * 0.016	0.36	0.00	rejected
H3	value = 3.12 + TFD * 0.055	0.18	0.01	rejected
H4	value = 3,27 - TFF * 0.03	0.23	0.00	rejected
H5	value = 1.89 + interest * 0.456	<0.001	0.47	supported

Conclusion

H1 and H5 were supported, while hypotheses 2, 3, and 4 were rejected. The duration of the attention that a person addresses to a bottle has a significant influence on the interest expressed. This influence is rather unconscious and relatively small, but present. This cannot be transferred to the speed at which a bottle is first seen. There were no significant correlations to be found. A similar relationship can be found between the variable TFD, TFF and the evaluated value - as there were no connections to be found, which have validity beyond the coincidence. The interest of a person is suitable as a good predictor for determining the estimated value. The analysis of variance between the four product categories reveal, wines with a modern design have generally received less interest and at the same time lower average values. This difference is significant. This does not apply to the implicit values, where there were no significant differences between the product groups.

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describe them to be of lower worth. These wines however occupy a niche for younger, less wine enthusiastic consumers. People who feel addressed by modern wine label designs do not share these prejudices, which is why they rightly have a place on the shelves.

Appendix

Appendix I. Depictions of wine label designs, wine type and assigned category

Category	Red	White
Minimalistic		
Themed		
Standard		

Classic		