

A Study of the Effect of Perceived Beer History on Reported Preferences by Sensory Panels with Different Levels of Training

J.E. Smythe¹ and C.W. Bamforth^{1,2}

ABSTRACT

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A study in three countries tested how consumers respond in paired-comparison tests to two beers that differed only in their reported history. In one test, consumers tasted two beers that had supposedly been produced with different brewing techniques. In the second, they compared two beers with apparently different sugar sources. In reality, for both tests all samples came from the same bottle. Results show clear indications that naïve judges will be likely to report a preference, while more highly trained judges will be more prone to express no preference, though all populations tested appear to be influenced by the concept of beer history.

Key words: Perception, preference, production technique.

INTRODUCTION

Attitudes and beliefs about a product influence consumer preference and the closely related concept of purchase intent². For example, among Swedish consumers of tomatoes, information supplied to consumers indicating that a particular sample was grown “ecologically” increased the preference for three out of four different tomato samples, whether or not the information had any truth to it³. This groundbreaking study strongly implicated the perceived history of a product for the first time in an experimental setting, although the fact that prior information concerning a sample impacts how a panel judges is well recognised⁴.

Little published data exists on the effect that the perceived production history of a beer has on the consumer’s perception of that product. In one such study, we showed that the same beer labelled as either “lager” or “alcohol-free lager” led to different responses for perceived authenticity, flavour intensity and fullness¹. A number of brewing companies position their brands on a provenance of traditional values, for example purest raw materials and painstaking processes occupying lengthy time periods. Conversely, some companies are striving to apply the latest advances in brewing science in order to shave costs through accelerated operating procedures. In this paper we

report a short study conducted using individuals from different countries aimed at determining the effect that *perceived* beer history has on reported preference.

MATERIALS AND METHODS

Subjects

Three different sets of judges participated. A set from Ireland (nine male, three female, aged 29–53) represented an untrained sensory panel. A set from Finland (six male, six female, aged 24–60) represented a trained sensory panel. A final set from Belgium (11 male, three female, aged 25–54) represented a rigorously trained and highly tested sensory panel. Regional breweries with experience in sensory work provided the sets of judges from their own employees. Though judges appeared to be offering preference ratings, the goals of this study were to regard the judges as analytical instruments in a deliberately misinformed setting. It is therefore important to consider the extent of sensory or brewing experience of the judges in this context.

Stimuli

Judges tasted two sets of pairs of beer samples (~30 mL) served at room temperature in plastic cups. The identity of the beer varied by location, within which each panellist was given all samples from a single bottle. Judges were unaware of this and were led to believe that the beers differed in their production aspects. The beers were labelled so as to indicate their supposed provenance.

Experimental design and protocol

In one test, subjects were told that one of the beers was made using traditional brewing techniques and took about 15 days to produce a brew, while the other beer was made using exactly the same ingredients, but with a revolutionary new process using modified yeasts and temperature controls that allowed the beer to be produced within 10 h. In the other test set, judges were told that one beer was produced according to the Reinheitsgebot using only water, hops, barley malt and yeast, while the other beer was made from exactly the same ingredients, but with 30% replacement of the malt by corn sugar adjunct. Judges and groups had samples and tests counterbalanced and randomised among them. Judges used all of their senses to answer the question of which of the two beers they preferred, if either. Special emphasis given individually to each judge clari-

¹Department of Food Science and Technology, University of California, Davis, CA 95616 USA.

²Corresponding author. E-mail: cwbamforth@ucdavis.edu

fied that it was acceptable to not have a preference between samples as long as they reported this on their response sheets. Judges recorded responses on an answer sheet. Testing times ranged from 2 to 9 min per judge.

Statistical method

This study uses Chi-squared to test the frequency of occurrence as related to chance levels, a method commonly employed for interpreting responses to questions about foods with multiple response categories⁵.

RESULTS

Table I summarises the results of this study. There are at least three ways of interpreting this data using Chi-squared statistics. The first (Analysis 1) is to assume an equal chance of a judge selecting any one of the three possible preference responses for each test. A second way (Analysis 2) is to compare responses in which the judge indicated a preference against those where the judge did not indicate a preference. A final means (Analysis 3) is to compare among those who expressed a preference the number that preferred traditional methods versus those who preferred non-traditional methods of brewing. Table II summarises these results, with NS signifying a significance level of $p > 0.1$.

DISCUSSION

Analysis 1 reveals that there is no significant difference in the judges' choices for the responses of no preference, modified, or traditional brewing processes in either study. However, since judges unknowingly tasted the same beer and evaluated them as if they were different, it is a reasonable to perform a Chi-squared test to determine if they had a preference at all, as is done in Analysis 2. This analysis reveals that more highly trained panels have an increased likelihood of reporting no preferences as com-

pared to the less well trained panels. This may be related directly to the degree of panellist training (i.e., a highly trained panellist would be less likely to have a preference in these tests). Analysis 3 tests whether traditional or modified brewing was preferred among those who expressed a preference. This revealed that only the highly trained panel had a significant preference for traditional brewing over modified brewing in the case of the brew time study. However, the general trend suggests that in almost all populations tested there may be a slight preference for the concept of traditional brew times, over accelerated processing, when a preference is expressed.

CONCLUSIONS

This study indicates that the *suggestion* of a beer's history may well play a psychological role in the perception of beer. This mirrors the findings of Johansson *et al.*³ with the perceived ecology of cultivation of tomatoes. Merely suggesting a difference between beer histories causes some judges to perceive beers as different. However, as panel members are more highly trained, they appear to be less likely to declare a preference, effectively superseding the misinformation they have been given. Among panellists who do express a preference, there is a tendency for an inclination toward traditional methods of brewing over accelerated forms. However, we clearly used only small sample sizes from the different regions. Testing a larger sample size would more accurately represent a target demographic population and can guide future consumer studies. Marketing studies might also make use of these approaches to determine if there is a predisposition among consumers for certain product characteristics.

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TABLE I. Number of judges and preferences in each study.

Degree of training Country	Brew Time Study			Adjunct Study		
	Rigorously Trained Belgium	Trained Finland	Untrained Ireland	Rigorously Trained Belgium	Trained Finland	Untrained Ireland
# who prefer traditional	7	5	5	6	7	6
# who prefer non-traditional	1	4	5	4	3	5
# with no preference	6	3	2	4	2	1

TABLE II. Chi-squared values, degrees of freedom and significance of results for the study.

Degree of training Country	Brew Time Study			Adjunct Study		
	Rigorously Trained Belgium	Trained Finland	Untrained Ireland	Rigorously Trained Belgium	Trained Finland	Untrained Ireland
Analysis 1						
Chi-squared	4.4	0.5	1.5	0.6	3.5	3.5
Deg. free.	2	2	2	2	2	2
Significance	NS	NS	NS	NS	NS	NS
Analysis 2						
Chi-squared	0.3	3.0	5.3	2.6	5.3	8.3
Deg. free.	1	1	1	1	1	1
Significance	NS	$p < 0.1$	$p < 0.05$	NS	$p < 0.05$	$p < 0.01$
Analysis 3						
Chi-squared	4.5	0.1	0	0.4	1.6	0.1
Deg. free.	1	1	1	1	1	1
Significance	$p < 0.05$	NS	NS	NS	NS	NS

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