The Effect of Third-Party Product Reviews on Product Choice

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Abstract

Market observations provide strong evidence that Third-Party Product Reviews (TPPRs) significantly influence the success or failure of the products evaluated (Chen and Xie, 2005). Apart from purely descriptive contributions, however, there have not been any studies so far that examine the impact of such test information on purchase behaviour. By means of an online experiment the relevance of TPPRs for product choice decisions will be examined. For this purpose a paired comparison choice experiment is conducted online and analysed by fitting a Bradley-Terry model.

Introduction and Literature Review

Third-Party Product Reviews (TPPRs) are neutral (as far as the producers' interests are concerned) and consumer-orientated product tests that are carried out by experts. The reviews are published in consumer journals or in special-interest-magazines like PC-World, Runner's World, Decanter or Wine Advocate and on the magazines' web pages respectively. They typically contain product-specific information like features and functions based on lab testing, experts' evaluations and the suggested retail prices. The reviews usually follow a description or a recommendation format (Chen and Xie, 2005, 220).

This study takes place in the context of quality wines. Such goods are typically characterised by several experience and credence attributes concerning their quality (e.g. taste, origin or durability), so that a potential customer faces a lot of risks, dissonances and insecurities prior to purchase. Therefore it is assumed that the purchase of such products is preceded by rather complex decision processes.

Importance/Relevance

Market observations provide strong evidence that TPPRs significantly influence the success or failure of the products evaluated (Chen and Xie, 2005). Suzuki for example took its Samurai from the US-market in 1995 because of bad results in the Consumer Reports and consequently declining sales figures (Hudson, 2003). After favourable TPPRs by Robert Parker[1], the demand for the wines rated usually increases considerably and prices rise significantly (Hadj Ali, Lecocq and Visser, 2008).

Recommendations and TPPRs in Marketing Research

Recommendations have exerted a considerable impact on marketing research. In this context we have to differentiate between research streams focussing on (e)word-of-mouth or online product recommendations (Bloom and Szykman, 1998; Chen and Xie, 2008; Lee and Youn, 2009; Senecal and Nantel, 2004; Shahana and Dawn, 2007), celebrity endorsement that mainly arises in advertising (Tripp, Jensen and Carlson, 1994) and TPPRs in advertisements (Dean, 1999; Dean, 2000; Dean and Biswas, 2001). Apart from that another related stream of research deals with the connection between TPPR, pricing and advertising from a macro perspective (Archibald, Haulman and Moody, 1983). Strategic recommendations how a company should react to positive and negative TPPRs can be found at Chen and Xie (2005).

Older works have focussed on the usage of TPPR in the consumer's decision making process (Raffée, 1984; Raffée, Schöler and Grabicke, 1975; Raffée and Silberer, 1981) in a descriptive way.

Gap and research question

According to Kroeber-Riel and Weinberg (2003) TPPR can substitute or bundle other information that is important during the customer's evaluation of a product's quality. In contrast to cues like price, country of origin and brand conducted (e.g. Dawar and Parker, 1994; Monroe and Krishnan, 1985; Rao and Monroe, 1989; Steenkamp, 1989), the cue character of TPPRs has rarely been studied. One exception is a study by Olshavsky and Rosen

(1985) who demonstrated that TPPR could simplify choice processes by reducing a customer's consideration set and the amount of attribute information needed.

Considering a growing number of TPPR that is available (not only in special-interest magazines, but also via the www), there is a need to deepen the knowledge on this matter in order to broaden the understanding of the customer. Therefore this work aims at delivering a contribution by answering the following research questions:

Do TPPRs exert influence on the consumer's product choice process? If they do so, how large is the importance of TPPR compared to price and brand? Are these effects moderated by subject-specific covariates like product knowledge or involvement?

Theories and hypotheses development

The assumed capability of TPPR to affect the consumer's choice behaviour is derived from various theories like Source Credibility (Batinic, 2008, 300; Dholakia and Sternthal, 1977; Eagly, Wood and Chaiken, 1978; Hovland, Janis and Kelley, 1953, 22), Risk Taking Theory (Cox, 1967a; Dholakia, 2001; Nicosia, 1969; Schweiger, Mazanec and Wiegele, 1976, 94), Cognitive Consistency (Herkner, 2001), Signal Theory (Boulding and Kirmani, 1993; Shimp and Bearden, 1980; Shimp and Bearden, 1982) and the Theory of the Economics of Information (Stigler, 1961). Consequently, the single hypotheses are developed.

Trustworthy sources and expert arguments trigger more positive positions with respect to the opinion propagated (Hovland and Weiss, 1951; Kelman and Hovland, 1953; Schulman and Worrall, 1970; Warren, 1969; Watts and McGuire, 1964; Whittaker and Meade, 1968). Additionally, credible sources arouse more behavioural compliance than incredible ones (Crano, 1970; Crisci, 1973; Ohanian, 1991; Ross, 1973; Schulman and Worrall, 1970; Woodside and Davenport Jr, 1974). Thus it is hypothesized that the perceived TPPR credibility affects consumer choice.

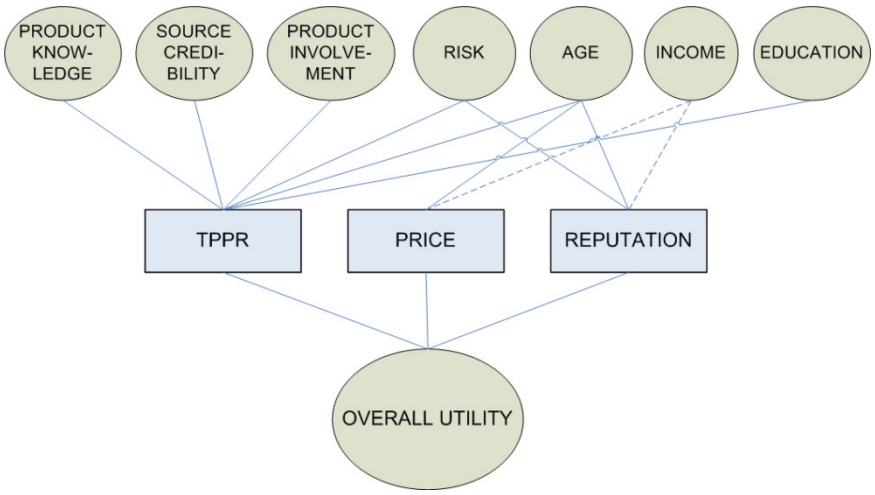
High product-knowledge consumers have attribute information available to be used in choice situations (Cowley and Mitchell, 2003; Roehm and Sternthal, 2001). Consequently the probability that they are influenced by endorsements is smaller (Biswas, Biswas and Das, 2006). By contrast consumers with less knowledge show greater confidence in peripheral cues (Rao and Monroe, 1988). So it is predicted that knowledge influences the reliance on TPPR and consequently choice.

Product-class involvement is associated with the motivation to process product specific information like TPPR. Perceived risk in the context of buying decisions can be seen as the anticipation of negative consequences arising from purchases (Bauer, 1960; Cox, 1967a). Consumers try to reduce risk and associated uncertainty by information acquisition. As TPPRs offer attribute specific product information it is hypothesised that involvement and perceived purchase risk interact with TPPR and act upon choice.

Some empirical works give weak evidence that the consideration of TPPRs raises with education and declines with age (N.N., 1979; Silberer, 1984). So this connection and its relevance for choice behaviour will be tested by the model. Finally it is assumed that age and income interact with the reputation and the price of a product, e.g. older people with higher incomes derive higher utility from prestigious, more expensive products. These structural relationships are depicted in figure 1. From the customer point of view a product may be interpreted in terms of utility or preference. Its value gets evident as a variation in the price or

brand changes the overall benefit ascribed to the product. The first row represents the subject covariates of the model and the second one the object covariates.

Figure 1: Hypotheses



Methodological and Empirical Approach

Firstly a focus group was assembled to assess the conditions for the experiment. Names of high and low reputation wine-growing estates in Austria were discussed. Talking about the most common and popular red wines from Austria lead to the selection of unoaked Zweigelt wines. The focus group specified a retail price range for these wines from € 5 to €14. Consequently the participants were confronted with selected TPPRs[2] on Zweigelt wines taken from the most famous Austrian wine journal *Falstaff*. They were asked to select three "good" and three "bad" Zweigelt TPPRs.

The Bradley-Terry (BT) model

Every product can be interpreted as an array of cues (Cox, 1967b). The consumer processes cues from this array in order to infer choice decisions (Steenkamp, 1990). Usually a straightforward approach with rating scales asking for the importance of cues is applied. From a survey point of view, this approach can be implemented easily. However, validity and reliability are threatened in more complex choice decisions as interviewees tend to rate every cue as important. Apart from that, consumers face huge problems in rating the cues separately (Salzberger, 2009).

These limitations can be overcome by a direct modelling of the choice situation. The BT-model (Bradley and Terry, 1952) represents a classical approach to analyse discrete decisions, particularly paired comparisons. It has been applied to a wide range of research problems. Apart from the research field of statistics, it was used to estimate the part worth of the mode of transport within a trip package (Hatzinger and Mazanec, 2007), to assess the relationship of person-environment fit and job satisfaction (Eggerth, 2004) and to evaluate product line design decisions (Schön, 2010). Moreover the model was applied to evaluate the ranking of economics journals (Stigler, Stigler and Friedland, 1995), citation patterns (Stigler, 1994) and

to estimate odds ratios for one scientific journal citing another (Liner and Amin, 2004). Apart from that it was also used to evaluate sports rankings (Agresti, 2002; Caudill, 2009).
The model is notably suited for situations where the probability of choice is proportional to some latent utility parameter. Thus it seems to be appropriate for psychological marketing research. The model is attractive because of its relative simplicity (Train, 2003, 43), but received severe criticism when generalized to situations where more than two alternatives are compared simultaneously (Louviere, Hensher and Swait, 2000, 160). Apart from that the model is scientifically well accepted (Graßhoff and Schwabe, 2008).

The BT-model is defined by

$$\Pi_{(jk)j} = \frac{\pi_j}{\pi_j + \pi_k}, \tag{1}$$

where $\Pi_{(jk)j}$ is the probability that object j (O_j) is preferred to object k (O_k) within the comparison of O_j and O_k. The location of the objects on a preference scale is described by the non-negative parameters π_j and π_k (Bradley and Terry, 1952). The BT can be described as a log-linear model (LLBT), too. Such a formulation incorporates important advantages over the classic BT. Firstly it is possible to deal with situations in which no decisions can be taken. Secondly it allows a simultaneous estimation of objects, object covariates and subject covariates (for a thoroughful discussion see Agresti, 2002; Dittrich, Hatzinger and Katzenbeisser, 1998; Hatzinger, 2009; Sinclair, 1982).

Experiment and first results

In an online administered experiment the interviewees were confronted with 14 randomly assigned paired comparisons[3]. The 14 choice tasks asked the interviewees to choose one of the two fictive wines presented at any one time. The data collection comprised 500 subjects, drawn from an online panel representative for Austria.

The object covariates TPPR, price and brand explain the characteristics of the objects so that the effects on the subjects' preferences can be measured (see table 1). Thus a conjoint exercise was applied in order to estimate the importance or utility of the single cues and their interactions for the product choice process of wines. A 2 (brand, higher/lower reputation) x 4 (TPPR, good, bad, editor's choice, none – see appendix for the TPPR used) x 2 (price level, € 6 und € 10) orthogonal design that consisted of 8 cards was developed by PASW Orthoplan (PASW, 2009) as follows:

Table 1: Product bundles used in the experiment.

card id	1	2	3	4	5	6	7	8
brand	higher reputation	lower reputation	lower reputation	lower reputation	higher reputation	lower reputation	higher reputation	higher reputation
TPPR	editor's choice	bad	none	editor's choice	bad	good	good	none
price	€ 10,-	€ 6,-	€ 10,-	€ 6,-	€ 10,-	€ 10,-	€ 6,-	€ 6,-

The worth parameters of the objects are depicted in figure 2, those of the object covariates in figure 3. Accordingly object seven (a wine from a high reputation winery, good TPPR for €

6,-) provided the largest utility and object three the lowest utility. All the estimates turned out to be significant at $p < .05$ apart from O2.

Figure 2: Object parameter estimates of the eight wines.

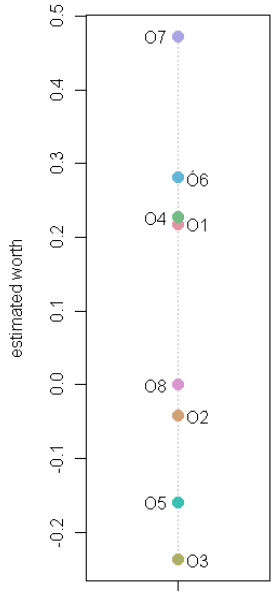


Figure 3: Object covariate parameter estimates.

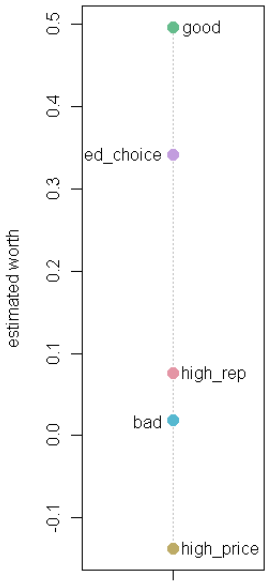


Figure 3 illustrates that high prices cause a negative impact on preference, while good TPPR and editor's choice show strong positive values. It is interesting that the reputation of the wine had a relatively small influence. This could be due to the strong effects of the good and the editor's choice TPPR, but also to the fact that fictive wines were used. The virtually neutral worth parameter of bad TPPR (not significant, see appendix) seems to be another remarkable result. It might be a hint that TPPRs are mainly used for a positive confirmation when intending to buy a specific wine.

Subject covariates (figure 1, first row) allow deviating from the assumption that all subjects (judges) have the same preferences. So it is possible that the ranking of the object covariates vary according to certain subject characteristics. The hypothesised relationships are depicted in figure 1 and will be tested by fitting a LLBT including all seven subject covariates in *R* (Hatzinger, 2009; Turner and Firth, 2010).

Summary, Added Value and Outlook

The first results indicate that TPPRs influence the consumer's decision making process. However, after testing the hypotheses more insight into the impact of TPPR is expected. This should also help answering the questions raised by figure 3. It will get clearer for instance why the bad TPPR has nearly no impact on the preferences by considering the interaction terms of "bad TPPR". This paper also tries to point out a methodological approach which helps to avoid problems stemming from questionable metric properties of rating scale responses by fitting a paired comparison model.

I'm looking forward to a thorough discussion of my results in New Zeeland where I expect to receive important hints on my final results. Moreover I would like to discuss my paper against the background of existing recommendation works in marketing.

APPENDIX

Foodnotes

(1) He is the most influential wine critic today. His reviews are published in his special interest magazine „The Wine Advocate“.
(2) TPPRs on wines in Austria usually contain a numerical rating (up to 100 points, between 80 and 94 in the category unoaked Zweigelt), and a verbal description.
(3) Using eight objects, this is the half of the 8x7/2=28 possible comparisons.

TPPRs used in the experiment (translated)

good TPPR: "Dark berry jam, hints of mocha and vanilla, spicy herbs, cherries, lush and elegant texture, nice extract sweetness, delicate finish with dark chocolate, long lasting finish, sweet fruit in the aftertaste, good development potential. Rating: 92 out of 100"

bad TPPR: “Nice cherries, elderberry that acts a bit volatile, biting tannins, angular and hard, no charm, little richness, earthy notes in the finish, not funny. Rating: 85 out of 100.”

editor’s choice: “Wine of the week”, *Falstaff* magazine.

Object covariate estimates

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Call:
gnm(formula = y ~ high_rep + high_price + good + bad + ed_choice, eliminate
= mu, family = poisson, data = newdes)


Coefficients of interest:
            Estimate Std. Error z value Pr(>|z|)
high_rep    0.07612     0.02368     3.215 0.00131 **
high_price -0.13763     0.02358    -5.837 5.33e-09 ***
good        0.49615     0.03440    14.423 < 2e-16 ***
bad         0.01837     0.03287     0.559 0.57614
ed_choice   0.34107     0.03332    10.237 < 2e-16 ***
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