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THE IMPACT OF PERCEIVED VALENCE, PERCEIVED INFORMATION CREDIBILITY AND VALENCE INTENSITY OF ONLINE REVIEWS ON PURCHASE INTENTIONS

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Abstract

The purpose of this paper is to examine the influence of the quality of product recommendations on buying intentions. An online experiment was conducted testing both the effect of the two dimensions of review quality (perceived valence and perceived information credibility) and the influence of valence intensity of the review content on purchase intentions. Both dimensions of the review quality were found to have a significant impact on purchase intentions. This effect holds for books and hotels, which were chosen to serve as research objects to provide information for both search and experience goods. In a subsequent analysis, we compared the effect of moderate and strong valence intensity of the review content. Interestingly, we found no significant difference of the effects of positive versus negative product reviews on purchase intentions in the two groups with moderate valence intensity. Although the present study is rather exploratory in nature, these findings are novel and crucial for both marketing research and practice.

Introduction

The phenomenon of buying recommendations has been of considerable interest in the marketing world for decades. Katz and Lazarfeld (1955) were among the first researchers who analyzed the effect of interpersonal influence on consumer choice. They showed that word-of-mouth (WOM) communication is more effective compared to traditional instruments of marketing, personal selling and various types of advertising [1]. An impressive number of studies have been conducted since the 'emergence' of the topic. Empirical evidence for the effect of word-of-mouth (WOM) communication has been provided for various industries or product categories (e.g., books, movies, hotels) [2-7].

The fast diffusion of the internet has further increased the importance of product recommendations. Many customers check shopping bots and recommendation sites before they make their buying decisions. It is not surprising that electronic word-of-mouth (subsequently abbreviated as eWOM) became a major research stream in marketing and the IS discipline [8]. The

information direction and the quality of recommendations are intensively discussed. For example, conflicting results have been found for the effectiveness of positive versus negative product reviews. Whereas Park and Lee (2009) propose a greater effect for reviews with negative content, East, Hammond and Lomax (2008) found positive WOM having a greater impact. Some scholars suggest testing for moderating variables, e.g., gender [9] product knowledge, involvement or interpersonal differences [10] to explain the above mentioned inconsistency of previous research findings, other authors argue that the simple dichotomization of product reviews in positive and negative recommendations is not grounded in reality. In fact, product reviews including 'pure' positive or negative information are hard to find. More often, product recommendations contain a mix of positive and negative product information chunks. Unfortunately, limited research effort has been given to the valence intensity of the content of product recommendations and their influence on consumer's attitudes and buying decisions.

To fill this gap, this paper examines the influence of the quality and valence intensity of product recommendations on buying intentions. An online experiment was conducted testing the effect of the two dimensions of review quality (perceived valence and perceived information credibility) and the influence of valence intensity of online reviews on purchase intentions. 339 students of a large European Business School rated their purchase intentions. Valence intensity was manipulated for buying decisions regarding books and hotels.

The findings of our experiment confirm the proposed relations. Both dimensions of review quality have a significant impact on purchase intentions. This effect holds for books and hotels as well. In a subsequent analysis, we compared the effects in moderate versus strong valence intensity conditions. Interestingly, we found no significant difference of the effects of positive versus negative product reviews on purchase intentions in the two groups with moderate valence intensity. From a managerial point of view, this is a crucial result given that in reality online reviews are usually a mix of positive and negative evaluations.

Theoretical Background and Hypotheses

Web-usage and e-commerce is growing constantly [11]. The fast expansion of the Internet has extended consumers' options for gathering product and purchase information [6] and has also altered decision-making and search behavior. Since the inception of B2C and C2C e-commerce [12], marketing research has started studying online-decision-making intensively [see for an overview, e.g., 13; 14; 15; 16]. Next to a major research stream focussing on psychological constructs explaining online decision making such as perceived risk [17] or uncertainty [18; 19], studying the nature and the effectiveness of eWOM has become a crucial issue [see 20 for an extensive review of previous studies on eWOM]. Both traditional WOM and eWOM play the informant as well as the recommender role [21]. In most studies, eWOM related to the explanation of purchase intentions was addressed. In current scholarly literature on eWOM, the so called eWOM effect is of major interest. This effect occurs, if online-shoppers exclusively base their purchase intentions and/or behavior on online recommendations. From a scientific point of view, it is interesting to study the eWOM effect in combination with variables relating to the customer such as motives or personality characteristics but also in combination with various characteristics of the eWOM message itself. Henning-Thurau and Walsh (2003), e.g., investigated motives for and consequences of reading customer articulations on the Internet [22], Goldsmith and Horowitz (2006) studied motivations for online opinion seeking [23] and Park and Lee (2009) examined how a website's reputation (established versus unestablished) and the information direction (positive versus negative) contribute to the eWOM effect. They found that the eWOM effect is greater for negative eWOM than for positive eWOM [6], whereas East, Hammond and Lomax (2008) found the opposite effect of positive WOM having generally a greater impact than negative WOM, albeit in an offline context [3]. Furthermore, Lee, Park and Han (2008) discovered that as the proportion of negative online consumer reviews increases, high-involvement consumers tend to conform to the perspective of the reviewers depending on the quality of the reviews. In contrast, low-involvement consumers tend to conform to the perspectives of the reviewers, regardless of the quality of the negative online consumer reviews [24]. These results suggest the valence of online-reviews (positive vs. negative), the level of involvement (search vs. experience goods) and the valence intensity of online reviews (strong/medium positive versus strong/medium negative) being critical issues for further and more detailed

research in an eWOM context. C2C-online reviews are usually a summary of one's positive and negative experiences with a good or a service. It is information from the consumer created for the consumer, presented from a subjective perspective including experiences, evaluations, and opinions [7]. They can be either very positive or very negative in terms of extreme values or something in between. As they are exemplified stories out of daily life experiences, in practice, the content of online reviews usually varies on a continuum from only positive, a mixture of positive and negative to only negative. As the perceived valence of the message has a significant impact on the eWOM effect [6] and online reviews in a real online-purchase setting are not necessarily exclusively positive or negative, it is necessary to have a closer look on the valence intensity (strong/medium positive versus strong/medium negative) of an online review and its influence on buying intentions. Recently, Cheung, Luo, Sia and Chen (2009) have suggested to examine positively vs. negatively framed reviews (valence) and one-sided vs. two-sided reviews (valence intensity) in an eWOM context in more detail [25]. Unfortunately, literature on this issue is still scarce. In the present experimental study, we aim at empirically testing whether valence intensity has an impact on purchase intention and is consequently reflected in the presence of an eWOM effect.

Based on our literature review, we assume the following hypothesized effects:

H1: Effects of perceived valence and valence intensity:

Perceived valence (measured by an explicit rating given by the respondents) and valence intensity (manipulated through experimental groups) have a significant effect on purchase intention for both search and experience goods. Based on previous, albeit conflicting findings, we expect strong positive reviews having the greatest impact, followed by strong negative ones. Regarding reviews of medium valence intensity, we expect the medium positive ones having a greater impact than the medium negative ones. This assumption is based on research regarding the persuasion effect of two-sided messages in advertising [see, e.g., 26]. This stream of research, based on inoculation, attribution and arousal theory, postulates that positive advertising messages mixed with an "optimal" proportion of negative information are amazingly effective for persuasion. This is due to the fact that two-sided messages are perceived as novel and lead to higher states of arousal and motivation to cognitively process the message [26].

H2: Effect of perceived information credibility:

Based on previous findings in literature [see, e.g., 27] perceived information credibility (measured by an explicit rating given by the respondents) is expected to have a significant positive effect on purchase intention for both search and experience goods.

As this paper is exploratory in nature, we also conducted further analyses especially regarding the impact of valence intensity among the different manipulation groups.

Method, Measurement and Procedure

The authors chose the method of online experiments for data collection. Online experiments have the advantage of experimenting around the clock, usually lower costs and a high degree of automation of the experiment which leads to low maintenance and can limit unwanted experimenter effects. A major disadvantage is the lack of control of the instructor during the experiment and a possible limitation regarding the coverage of certain demographic groups such as people without Internet connection [see for a methodological review, e.g., 28; 29; 30]. However, in the current research project the method of online experiments is appropriate since the test situation equals a 'real' product evaluation and purchase decision making process in e-commerce based on online reviews. In this case, choosing the Internet as the setting of the experiment enhances external validity. The usual limitation of the online experiment's dependency on computers and networks is also a non-disturbing issue in our context as our test subjects would need to have an Internet access for both online-shopping and participating in the online experiment. For examples of prior studies which successfully used online experiments see [31-35].

In the present study, books versus hotels were chosen as the objects of investigation for comparison between search and experience goods as well as between high and low involvement purchase decisions. The buying-decision concerning books and hotels via the Internet was chosen as it satisfies several essential criteria. First, books and hotels are one of the major product categories sold over the internet. Buying books over the Internet was one of the early applications of e-commerce and has matured to become relatively stable [36]. Online-bookings of package holidays, flight tickets and hotels are booming. Second, books are typically a low-involvement product whereas the purchase decision-making process concerning hotels is certainly characterized as being medium to high involvement. Third, the majority of consumers are familiar with both books and hotels.

Two pictures (one book cover and one picture of a hotel) served as product stimuli. Four different online reviews (positive/negative vs. medium/strong valence intensity) were used as manipulations for each product type. Each review comprised subjective evaluations, product information and stories about the experience with the book or hotel, respectively. The product stimuli as well as the valence and the valence intensity of the online reviews were pre-tested in an online experiment (n=56). Additionally, technical issues such as randomization of respondents and data export were tested before the main study was conducted.

The main study was conducted two weeks after the pre-test. An electronic invitation to take part in the research project was emailed to students of a large European Business School. As many students buy books [36] or book hotels using the Internet, a student sample qualifies for being employed. 5 vouchers of a travel agency were promised to 5 randomly drawn students as incentives. Finally, 339 respondents participated in the online experiment. Respondents were randomly assigned to the control and the experimental groups for each trial. Table 1 shows the sample sizes for each group.

	<i>Sample Sizes by Group</i>		
	<i>Control Group</i>	<i>Positive Online Review</i>	<i>Negative Online Review</i>
<i>Book Reviews</i>			
Medium Recommendation	114 (33.6 %)	90 (26.5 %)	135 (39.8 %)
Strong Recommendation	129 (38.1 %)	110 (32.4 %)	100 (29.5 %)
<i>Hotel Reviews</i>			
Medium Recommendation	112 (33.0 %)	111 (32.7 %)	116 (34.2 %)
Strong Recommendation	111 (32.6 %)	116 (34.2 %)	112 (33.0 %)

Table 1: Sample Sizes of the Main Study

The distribution of the sample sizes across the eight sub groups is moderately homogenous. Sample sizes vary between 90 (positive book review) and 135 (negative book review). The median sample size is 112. Based on our 2 (book vs. hotel) x 2 (positive vs. negative) x 2 (medium vs. strong valence intensity) factorial design we ended up with 8 manipulation groups. The control group was not included in the analyses at this stage of the project.

Purchase intention measured by the item "How likely will you buy the book?" and "How likely will you book a vacancy in this hotel?", respectively, was chosen as the dependent variable. We employed a seven point rating scale, 1 = "very likely", 7 = "very unlikely".

Additionally, we included two control variables measuring the perceived valence and the information credibility of the online reviews provided in the experiment. These control variables also served as independent variables in our statistical analyses for testing their explanatory power regarding the purchase intention. The measures for the two independent variables (perceived valence of the product reviews and perceived information credibility) were derived from explicit ratings given by the respondents answering a semantic differential scale (positive – negative, trustworthy – not trustworthy). Lower values indicate a more positive perceived valence and a more trustworthy evaluation of online reviews.

Results

The analysis of the data was carried out in two steps. As a first step, we ran a series of regression analyses testing for the effect of perceived valence and perceived information credibility on purchase intention for each experimental group separately (see for the results Table 2 and Table 3). As a second step, the purchase intentions of the different experimental groups were compared in an ANOVA to test for the eWOM effect.

	<i>Stand. Coeff.</i>	<i>p-Value</i>
<i>Medium Positive Purchase Recommendation</i>		
Perceived Valence	.468	.000
Perceived Information Credibility	.144	.079
<i>Medium Negative Purchase Recommendation</i>		
Perceived Valence	.197	.038
Perceived Information Credibility	-.267	.005
<i>Strong Positive Purchase Recommendation</i>		
Perceived Valence	.358	.000
Perceived Information Credibility	.237	.008
<i>Strong Negative Purchase Recommendation</i>		
Perceived Valence	.123	.190
Perceived Information Credibility	-.366	.000

Dependent Variable: Purchase Intention

Table 2: Regression Analyses Book Reviews

	<i>Stand. Coeff.</i>	<i>p-Value</i>
<i>Medium Positive Purchase Recommendation</i>		
Perceived Valence	.648	.000
Perceived Information Credibility	.124	.088
<i>Medium Negative Purchase Recommendation</i>		
Perceived Valence	.160	.073
Perceived Information Credibility	-.317	.001

<i>Strong Positive Purchase Recommendation</i>		
Perceived Valence	.302	.001
Perceived Information Credibility	.398	.000
<i>Strong Negative Purchase Recommendation</i>		
Perceived Valence	.186	.048
Perceived Information Credibility	-.207	.027

Dependent Variable: Purchase Intention

Table 3: Regression Analyses Hotel Reviews

The results of the regression analyses for books and hotels are outlined in Table 2 and Table 3, respectively. They show a homogenous picture for both independent variables across all sub groups. The p-values of the standardized regression coefficients of perceived valence are below the recommended .05 threshold in 6 out of 8 cases. A p-value of .073 was found in the group of medium negative hotel recommendation. A non-significant effect of perceived valence was given for the strong negative book recommendation group. Based on these results, we conclude that perceived valence has a significant effect on purchase intention for search and experience goods.

For information credibility the effect is significant in 6 out of 8 regressions. The remaining p-values are close to the widely accepted .05 levels. Both non-significant relationships are found in the medium positive recommendation group. Despite this fact, we follow the majority of significant effects and conclude a significant effect of information credibility on purchase intention.

Interestingly, the effect sizes for both dimensions of quality of recommendations vary heavily across the eight sub groups. Whereas standard coefficients for perceived valence are highest for medium positive recommendations (.648 and .468), information credibility has its greatest impact in regressions with negative review information for books (e.g., -.366 for strong negative purchase recommendation) and strong positive reviews for hotels (e.g., .398). Hence, perceived valence is more important for online reviews being of medium positive valence intensity for both search and experience goods. Information credibility becomes more critical in cases of strong product recommendations, even though the results are varying across product categories. These results perfectly fit the findings within the two-sided-persuasion-approach. Medium positive reviews (a mixture of positive and slightly negatively toned information) have the strongest impact on buying intentions.

Furthermore, the authors conclude that perceived valence and perceived information credibility can be regarded as 'independent'

dimensions of recommendation quality. When studying the eWOM effect of recommendation quality, both dimensions have to be taken into account separately.

For testing the experimental effect of valence intensity (comparing the four different manipulation groups for books and hotels, respectively) in more detail, we followed a sequential approach. First, we plotted the various means of purchase intention, perceived valence and credibility of online reviews to gain a first feeling for various effects. Figure 1 and Figure 2 show the values of the three variables for book and hotel, respectively.

The main results visualized in Figure 1 and Figure 2 can be summarized as follows: The average purchase intentions of the respondents differ significantly across the manipulation groups (low values indicating a high purchase intention, as purchase intention was measured on a seven-point rating scale with end points verbalized as 1 = “very likely”, 7 = “very unlikely”). However, the difference of the manipulation effect between positive and negative online reviews is much smaller for the medium valence intensity group. This holds for the book and the hotel experiment. On the other hand, regarding strong purchase recommendations, the mean difference of the purchase intentions between positive and negative online reviews is dramatic for both book and hotel. Based on this qualitative assessment, the authors postulate an effect of valence intensity on purchase intentions.

Perceived Quality of Recommendations: Book

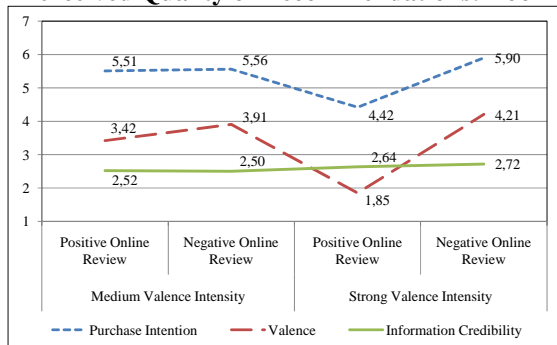


Figure 1: Purchase Intention, Perceived Quality of Online Review, Credibility of Online Review

Perceived Quality of Recommendations: Hotel

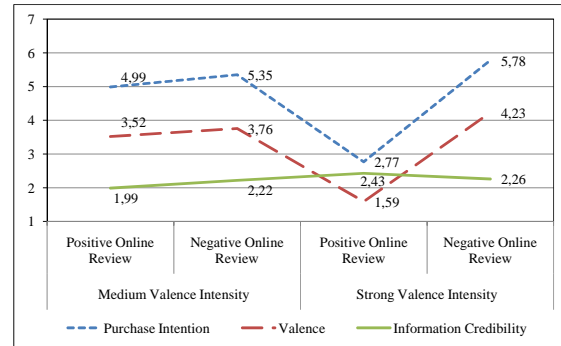


Figure 2: Purchase Intention, Perceived Quality of Online Review, Credibility of Online Review

A series of ANOVAs were run testing for the effect of valence intensity. Table 4 shows the results separated for book and hotel reviews. The results of the significance tests confirm the findings of the visual inspection. Whereas valence has a significant impact in three of four experiments, a post-hoc Scheffé test which compares the purchase intentions of the positive and negative manipulation groups yielded non-significant differences in the low valence intensity groups. On the other hand, the differences in purchase intentions are highly significant when respondents of positive and negative manipulation groups with strong product recommendations are compared. In other words, the effect of positive recommendations with medium valence intensity does not differ significantly from medium negative product recommendations. This could be mainly due to the fact, that both medium positive and medium negative reviews are a mixture of both positive and negative content. Whereas the individually perceived valence of the reviews (see table 2 and 3) has an impact on buying intentions especially within the medium positive valence intensity group, directly comparing the stated purchase intentions of the two medium valence intensity groups does not show a significant difference. Strong recommendations influence the preferences and purchase intentions of respondents. This effect is even greater for services (hotels, $r^2 = .384$) than products (books, $r^2 = .149$).

	F-value (df)	p-value	R ²	Scheffé-Test ¹
<i>Book Reviews</i>				
Medium Valence Intensity	3.740 (2;336)	.173	.004	.983
Strong Valence Intensity	30.553 (2;336)	.000	.149	.000
<i>Hotel Reviews</i>				
Medium Valence Intensity	21.790	.001	.038	.267

Valence	(2;336)			
Intensity				
Strong	258.315	.000	.384	.000
Valence	(2;336)			
Intensity				

¹ This column shows p-values for the Scheffé-Test of group differences between positive and negative manipulation groups.

Table 4: ANOVA Results

Conclusion and Outlook

WOM communication has a long tradition in marketing research. The research stream became even more popular and important since the emergence and rapid diffusion of the internet. Many empirical studies have provided empirical evidence for the effect of electronic WOM in general. However, as we stated in the theoretical part of this paper, findings about the quality and the valence intensity of online reviews is limited. Furthermore, previous findings about the direction of product evaluations are partly inconsistent and can be questioned for their simplification in either purely positive or purely negative reviews. This simple dichotomization is not grounded in reality. In fact, trade-offs between and within product recommendations can be found more frequently. We target the quality of product recommendation in general and the valence intensity in particular. Four experimental trials were conducted testing the hypotheses. The effects of perceived valence and information credibility on purchase intentions were significant in six out of eight tested relationships. Interestingly, the findings indicated that the influence of perceived valence is more important in situations where positive product evaluations occur. Information credibility becomes more critical in cases of strong product recommendations, even though the results are varying across product categories. Explaining these conflicting findings is subject to further research.

In a subsequent analysis, we tested for the experimental effect of valence intensity. As proposed, we found only a significant effect in the groups with strong product recommendations. Groups with manipulated moderate positive versus negative valence intensity did not show a significant difference in purchase intentions.

These findings are crucial for e-tailers. As consulting online consumer reviews has literally already become 'state-of-the-art' in online purchase decision-making, marketing practice should have a closer look not only on the valence of consumer postings but rather on the valence intensity.

The present study has also some limitations. First, business students were chosen as respondents. Further studies are already scheduled and will recheck whether our findings hold for a

broader population. However, as prior research has shown that students are familiar with the internet, often buy online and use recommendation sites before they make their buying decisions frequently, our findings can be generalized at least for this important target group of e-tailers. Second, our findings are based on an online experiment. Whereas the technique has been criticized for limited control of situational effects during the experiment, we are convinced that the 'test situation' should be as realistic as possible. Hence, we think that online experiments are appropriate for a study on eWOM. For comparison of results we suggest conducting a replication study carried out in a traditional offline experimental setting. Third, we have used only two products (books and hotels) which are typically bought online. Again, we think this approach is appropriate for an exploratory study since the research on this topic is still scarce. Finally, we have compared groups with moderate and strong valence intensity. We showed that the valence intensity of an online review is a crucial issue that has to be taken into account. However, we did not search for the threshold of strength when an 'ineffective' product recommendation tends to become effective. Although this threshold is certainly hard to determine, these findings are of considerable interest for researchers and marketing managers. Testing for this threshold would require a relatively high number of stimuli (reviews) that slightly vary in valence intensity. Given the advantages of relatively low set-up costs and the possibility to reach a broader population, applying an online experiment would be a proper environment. Chen, Shang and Kao (2008) found that individual differences in online-shopping experience and information processing abilities are having an impact on how effectively and efficiently online product information is processed [10]. Further research on online review valence and valence intensity should also address this issue of possible personal differences by including personality variables. In this regard, we suggest having a closer look on the latent constructs of susceptibility to interpersonal influence [37] or self-esteem [38]. We assume that these concepts majorly contribute to the understanding of the eWOM effect in a context of online-reviews varying in valence intensity. The explanatory value of other phenomena already found relevant in a broader context of eWOM such as information overload [10] or cognitive personalization [39] should also be taken into account when investigating the quality of online reviews.

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