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A META-ANALYTIC INVESTIGATION OF THE ROLE OF VALENCE IN ONLINE REVIEWS

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ABSTRACT

Neither theory nor empirical findings have reached a consensus regarding the relationship between online review valence (i.e., whether reviews in a review set are predominantly positive or negative) and evaluations of these reviews. Based on a meta-analysis, this study aims to clarify the influence of online review valence on perceived usefulness of the reviews and on attitudes towards the product. The findings suggest that review valence affects perceived usefulness differently than it affects attitudes. Primarily negative review sets that include some positive reviews show the strongest effect on perceived usefulness, while primarily positive review sets that include few negative reviews are most successful in influencing attitudes. Additionally, review valence has a stronger influence on perceived usefulness when the reviews refer to experience (rather than search) products, familiar (rather than unfamiliar) brands, and come from US consumers (rather than consumers elsewhere). These findings provide several implications for researchers and practitioners.

HIGHLIGHTS

- Online review valence affects perceived usefulness differently than attitudes.
- Primarily negative review sets have the strongest effect on usefulness.
- Primarily positive review sets have the strongest effect on attitudes.

- Valence effects on usefulness depend on product experience, brand familiarity, and culture.

KEYWORDS

Online reviews, review valence, perceived usefulness, product attitudes, meta-analysis

A META-ANALYTIC INVESTIGATION OF THE ROLE OF VALENCE IN ONLINE REVIEWS

INTRODUCTION

Online reviews about products work as a form of free “sales assistance” (Chen and Xie 2008), because consumers use these reviews to learn about products and to reduce uncertainty and transaction costs (Lee, Park and Han 2008). Consumers usually come across both positive and negative reviews related to a product. The influence of review valence has received considerable attention both from scholars and practitioners (e.g., Lee and Youn 2009). However, findings regarding the role of review valence on consumers’ evaluations are not straightforward. For instance, while Forman, Ghose and Wiesenfeld (2008) found that review sets with extremely high or low product ratings (i.e., 1- and 5-star ratings) were associated with higher levels of helpfulness than reviews with moderate ratings (i.e., 3-star ratings), Mudambi and Schuff (2010) found quite the opposite: moderate ratings (i.e., 3-star ratings) are more helpful than extreme low or high ratings (i.e., 1- and 5-star ratings). Similarly, Purnawirawan, Dens and De Pelsmacker (2012) found that, when presented in a certain order, a review set with four positive and four negative reviews is capable to generate an attitude as positive as with a set with six positive and two negative reviews.

To explain these mixed findings, we perform a meta-analysis on the influence of valence of online reviews on consumers’ evaluations and show how product type, brand familiarity, and the degree of positivity (i.e., the extent to which review sets contain positive reviews) clarify the mixed results in previous studies. Our study contributes to the literature as follows. First, we provide an integrative review of the empirical literature on the effects of online review valence

on perceived review usefulness, attitude, purchase intention, recommendation intention, sales and credibility. By calculating mean effect sizes, we show whether and how online review valence affect evaluations and we resolve inconsistency in findings across primary research studies. The meta-analytic result indicate a pattern of weak and strong effects of online review valence that can guide future research and practice. Second, by means of moderator analyses, we provide answers about the causes of the mixed findings. Next to the suggested moderators (brand familiarity, product type, and culture), we identify positivity degree as a key moderator that explains mixed findings of previous studies. In particular, we show that review valence affects perceived usefulness differently than it affects attitudes. This finding provides a new explanation on the effectiveness of online review valence that provides critical insights for scholars, managers, and website owners.

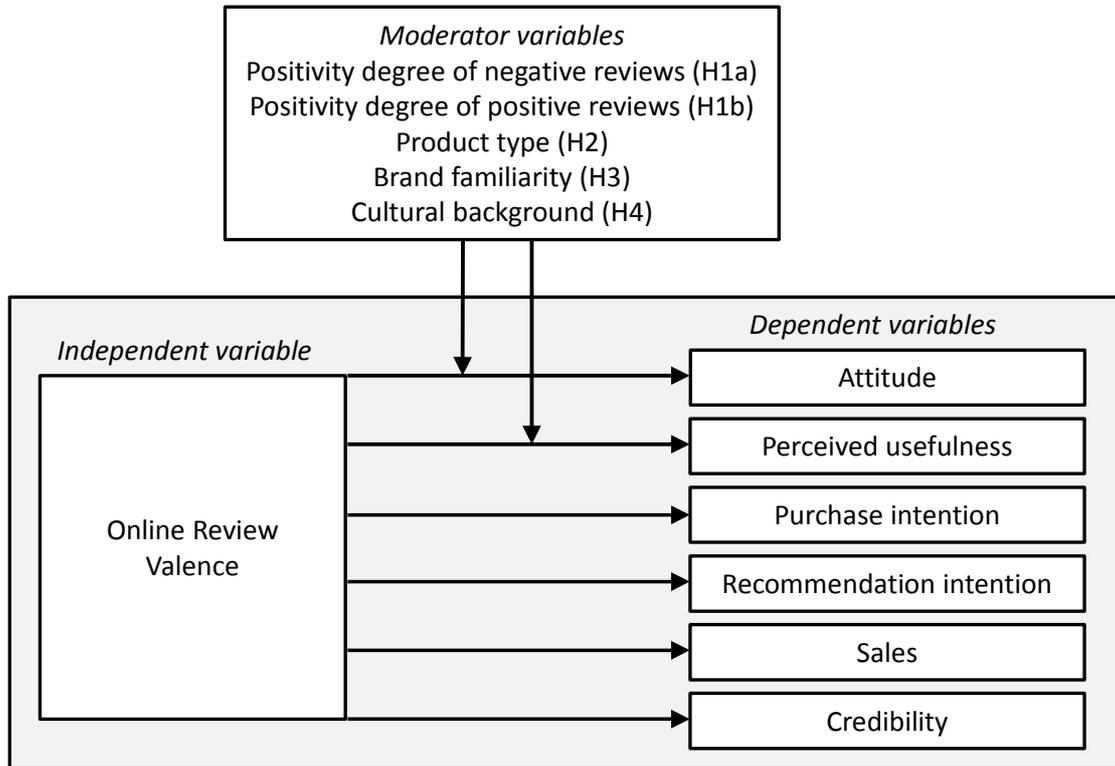
The remainder of the text is organized as follows. First, we present a literature review and develop hypotheses. Second, we describe the meta-analytic procedures, including the literature retrieval process, database development and the coding and computation of the effect sizes. Next, we integrate the effect size estimates and conduct a meta-analytic regression to test the proposed hypotheses. Finally, we conclude with a discussion of managerial and future research implications.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

We start with discussing how review valence influences several dependent variables: attitude, perceived usefulness, purchase intention, recommendation intention, sales and credibility. After that, we develop hypotheses related to the moderator variables. Figure 1 provides an overview of our research model.

Figure 1

Research Model



Independent and Dependent Variables

The independent variable in this meta-analysis is *online review valence*, which refers to whether reviews in a review set are predominantly positive or negative. In this study, we consider three different types of *review sets*: a single review set, a set of several reviews and product rating. This means that the effect of valence can stem from a comparison between one positive versus one negative review (e.g., Sen and Lerman 2007), a set of positive versus a set of negative reviews (e.g., Doh and Hwang 2009) and from product ratings (e.g., scores from 1 (low) to 5 (high)) that are based on set of reviews (e.g., Forman, Ghose and Wiesenfeld 2008). Thus,

for this study, we take into account all published studies that contrasted the effect of one positive versus one negative review, or the effect of a set of positive versus a set of negative reviews, or measured the impact of product ratings on the dependent variables in our research model.

The dependent variables that have been investigated in prior research are attitude, perceived usefulness, purchase intention, recommendation intention, sales and credibility. Table 1 provides the definition and operationalization of these variables. It further details the expected relationship of valence on these dependent variables, which we formulate based on the major tendency of findings in prior literature. For this purpose, Table 1 provides references to some representative studies that have investigated the relationship.

Moderator Effects

Inclusion of potential moderators is necessarily restricted to variables that can be coded from the primary studies included in the meta-analysis and it should be restricted to those that theory of logic indicate should have an impact on the relationship. To explain mixed findings in previous research, we argue that, as consumers made their evaluation based on reviews, the positivity degree of the reviews influences their evaluations (see below). In addition, as suggested by several authors (e.g., Chakravarty, Liu and Mazumdar 2010; Sen and Lerman 2007), we also discuss the potential moderating role of product type, brand familiarity, and culture. Due to an insufficient number of effect sizes for purchase intention, recommendation intention, sales and credibility, we perform the moderator analyses on perceived usefulness and attitude only. Both variables are considered focal variables in previous research. Table 1 provides an overview of the moderator variables, their definition and operationalization, and the expected relationship with the effect size estimate.

Table 1

Variables Investigated in the Meta-analysis

<i>Main variables</i>	<i>Definition and operationalization</i>	<i>Expected relationship with effect size estimate</i>	<i>Representative studies</i>
Valence	Whether a review set (single review set, a set of several reviews, or product rating) is predominantly positive or negative.	-	
Attitude	Evaluation of the reviewed object. Variables included: attitude toward the product, product evaluation, review impression, movie evaluation, and preference.	positive	Doh and Hwang 2009; Lee, Park and Han 2008; Purnawirawan, De Pelsmacker and Dens 2012
Usefulness	Extent to which the online review is evaluated helpful in facilitating consumer's purchase decision process. Variables included: review perceived usefulness/helpfulness, (e)WOM effect, usefulness vote.	weak positive/non-significant	Duan, Gu and Whinston 2008; Liu 2006; Mudambi and Schuff 2010; Sparks and Browning 2011; Wu, Van der Heijden and Korfiatis 2011
Purchase intention	Intention to buy the reviewed object. Variables included: behavioral intention, purchase intention, booking intention, buying intention.	positive	Bae and Lee 2011; Berger, Sorensen and Rasmussen 2009; Cheung and Lee 2008; Xia and Bechwati 2008
Recommendation intention	Intention to recommend the reviewed object. Variables included: (e)WOM intention, willingness to recommend the product.	positive	Lee and Youn 2009; Sohn 2009
Sales	Observed change in sales of the reviewed object: Variables included: revenue, sales ranking (reversed), number of bookings, box office revenue.	weak positive/non-significant	Chevalier and Mayzlin 2006; Duan, Gu and Whinston 2008; Forman, Ghose and Wiesenfeld 2008; Liu 2006
Credibility	Evaluation of the source of the reviews. Variables included: attitude toward the website, source credibility, attribution toward the reviewer, review credibility.	unclear	Cheung and Lee 2008; Hong and Park 2012; Sen and Lerman 2007; Tsang and Prendergast 2009; Utz, Kerkhof and van den Bos 2012
<i>Moderator variables</i>	<i>Definition and operationalization</i>	<i>Expected relationship with effect size estimate</i>	
Positivity degree	The degree of positivity of the review, as measured by two variables: (1) PDpos is the percentage of positivity in positive reviews, and (2) PDneg is the percentage of positivity in negative reviews.	Usefulness increases with increasing positivity of negative reviews (H1a) and attitude increases with decreasing positivity of positive reviews (H1b).	
Product type	Is categorized as 1 when a study used an experience good, and 0 when a search good is used.	Usefulness & attitude: experience > search (H2)	
Brand	Describes whether the brand used in the study is known/familiar = 1, or unknown/fictitious = 0.	Usefulness & attitude: familiar < unfamiliar (H3)	
Culture	Cultural background records whether a study is conducted in the USA = 1, or elsewhere = 0.	Usefulness & attitude: USA > elsewhere (H4)	

Positivity Degree

To measure the effects of valence, studies mostly compare the results for the dependent variables in terms of (predominantly) positive reviews versus (predominantly) negative reviews in a review set. Therefore, we consider two types of *positivity degree*: positivity degree in the positive reviews (PDpos) and positivity degree in the negative reviews (PDneg). We argue that the positivity degree, that is, the proportion of positive reviews, can provide more insight in seemingly conflicting findings. More specifically, this means that an effect size on perceived usefulness or attitude stemming from a comparison between 100% positivity in the positive reviews and 0% positivity in the negative reviews would be different than an effect size stemming from a comparison between 75% positivity in the positive reviews and 25% positivity in the negative reviews.

For both perceived usefulness and attitude, we argue that the effect of valence should increase with increasing positivity in the negative reviews, and decrease with increasing positivity in the positive reviews. Research on two-sided advertising suggests that including a small amount of negative information can increase persuasion, because it indicates that the advertiser is telling the truth (Eisend 2006). The inclusion of some negative information in an otherwise positive set of information increases the credibility of the reviews, which increases their effectiveness. This indicates that the influence of valence on perceived usefulness and attitude is strongest when reviews do not only discuss the weaknesses or the strengths of the product, but both the strengths and weaknesses of the product. Balanced reviews that discuss both sides of the product may be more effective than extreme reviews (positive reviews with a high degree of positivity and negative reviews with a low degree of positivity). Thus, a higher

degree of positivity in the negative reviews and lower degree of positivity in the positive reviews would lead to a stronger influence of valence on perceived usefulness and attitude.

For perceived usefulness, we argue that the negative reviews would matter more than the positive reviews. According to the accessibility-diagnostics theory (Feldman and Lynch 1988; Skowronski and Carlston 1989) negative information has a systematically stronger influence on judgment than the equivalent positive information (Ahluwalia and Gürhan-Canli 2000; Herr, Kardes and Kim 1991). That is, compared to positive reviews, negative ones are more novel and attention-grabbing and have greater salience (Pratto and John 1991; Willemsen et al. 2011) which makes them more easily accessible in memory (Chiou and Cheng 2003; Purnawirawan, De Pelsmacker and Dens 2012). Furthermore, negative reviews also allow consumers to categorize the product as low quality because low-quality products usually have negative attributes. In contrast, based on positive reviews, it is difficult to categorize the product as high in quality because any product can have some positive attributes (Herr, Kardes and Kim 1991).

As for attitudes, in contrast to perceived usefulness, we argue that positive reviews would matter more than negative ones. According to confirmation bias, people are more likely to consider information that is consistent with their beliefs or predisposition when forming an evaluation (Edwards et al. 2009; Nickerson 1998). Applied to online reviews and given that on the Internet more positive than negative reviews can be found (Bronner and De Hoog 2010; Chevalier and Mayzlin 2006) and people are reading online reviews to assist them in their (pre-existing) buying decision and to confirm these decisions (Chen and Xie 2008; Sen and Lerman 2007), it is very likely that people give more weight to positive than negative reviews, because positive reviews are more consistent with their decision. Therefore, we hypothesize that the

degree of positivity moderates the influence of review valence on (a) perceived usefulness of reviews and (b) attitude as follows:

H1: (a) Usefulness increases with increasing positivity degree in negative reviews and (b) attitude decreases with increasing positivity degree in positive reviews.

Product Type: Experience versus Search Goods

Product type moderates the influence of online review valence on perceived usefulness and attitude (e.g., Xia and Bechwati 2008). *Search goods*, such as electronics, are products that consumers can accurately evaluate prior to purchase because they have apparent and functional attributes for which consumers can obtain valid information before product use. On the other hand, *experience goods*, such as restaurants or hotels, are dominated by intangible attributes that consumers do not know until purchase or use, and for which performance evaluations can be verified only by (sensory) experience or consumption (Nelson 1970).

We expect that the influence of valence on review usefulness and attitude is stronger for experience goods than for search goods. The evaluation of search products are based on objective criteria, while evaluations of experience goods are more subjective and lack common standards (Sen and Lerman 2007). Due to the intangible and ambiguous character of experience goods, perceived risk and uncertainty increase along the search-experience product continuum (Park and Lee 2009). Because consumers lack product experience before purchase of experience products, consumers face greater pre-purchase uncertainties for experience products than search products (Park and Park 2013; Zhu and Zhang 2010). Therefore, they might seek additional information as an effort to reduce perceived risk and uncertainty (Park and Lee 2009). In this case, negative reviews might even become more diagnostic than positive ones (Skowronski and

Carlston 1989). As a result, the influence of valence might be stronger for experience than search products. In other words, consumers would respond more strongly to valence when the reviews relate to an experience rather than a search product.

H2: The effect of valence on (a) perceived usefulness and (b) attitude is stronger for experience than for search goods.

Brand Familiarity

The branding literature suggests that *brand familiarity* (i.e., whether the consumer is familiar with a brand or knows the brand) affects the influence of online reviews on the perceived usefulness of these reviews and the attitude toward the product (e.g., Berger, Sorensen and Rasmussen 2009; Vermeulen and Seegers 2009). Familiar or known brands have strong memory networks, while unknown brands have no (or little) existing cognitive structures (Berger, Sorensen and Rasmussen 2009; Connors, Mudambi and Schuff 2011). As consumers have obtained a certain knowledge or expertise regarding familiar brands and have no or little knowledge and expertise regarding an unfamiliar brand, the informative effect of online reviews are stronger for unknown than for well-known brands (Vermeulen and Seegers 2009; Zou, Yu and Hao 2011). Moreover, when consumers are familiar with a brand, they are capable of making their own judgment without relying on online reviews. Negative reviews might become more diagnostic than positive ones when they involve an unfamiliar brand, as a negative review allows consumers to assess product quality more accurately than a positive review. We expect that the influence of review valence is stronger for unfamiliar brands, than for familiar brands. In other words, for consumers, the role of valence is more important when they are reading reviews about unfamiliar rather than familiar brands.

H3: The effect of valence on (a) perceived usefulness and (b) attitude is stronger for unfamiliar brands than for familiar brands.

Cultural Background

The *cultural background* of individuals may moderate the influence of valence on perceived usefulness and attitude. As opposed to many other cultures, the US culture is the most individualistic culture in the world (Hofstede 2001). US consumers have weaker bonds with other individuals, and consequently, they might rely more on online information compared to consumers from other countries, for whom personal opinions by close friends or family are more important. Additionally, the Internet was developed in the United States and US Americans belong to the heavy online users worldwide. This indicates that US consumers have on average more experience and higher frequency of Internet use than most other countries. Therefore, US consumers are probably more receptive to e-commerce activities and rely more on online recommendations than consumers elsewhere do. As a result, US consumers might react stronger to review valence than consumers in other countries might.

Individualistic values affect the variation in valence and thus its effectiveness (in terms of attitudes and usefulness), because US reviewers value freedom of expression and show their opinions more openly; they express their likes and dislikes more clearly, which leads to more variation in review valence (Koh, Hu and Clemons 2010). Furthermore, US reviewers tend to be more specific in their reviews and they express their own opinions without reproach (Huang 2005), which increases the usefulness of reviews. Based on these arguments, we hypothesize:

H4: The effect of valence on (a) perceived usefulness and (b) attitude is stronger for US consumers than for consumers elsewhere.

METHOD

Selection of Studies

To identify relevant studies for the meta-analysis, we carried out a series of search strategies, similar to the procedures in other meta-analyses (e.g., Joseph et al. 2007; Wu and Lederer 2009). First, a computerized bibliographic search was performed using electronic databases (e.g., EBSCO, JSTOR, ScienceDirect) followed by an Internet search on Google Scholar. Next to “valence”, we focused on keywords such as “online (consumer) review”, “product review”, “electronic word of mouth”, “online recommendation”, “user generated content”, “computer mediated communication”, “online comments”, “online articulation”, “online rating” and “product rating”. Second, we conducted a manual search of relevant journals. Third, we contacted several authors of empirical studies that we identified as experts on the meta-analysis topic and requested working papers and forthcoming articles. Once a study was identified, references were examined in a search for further studies.

We selected all studies that investigated the influence of the valence of online review sets, that is, studies that contrasted the effect of positive versus negative online reviews, the effect of a set of positive versus a set of negative reviews, or measured the impact of product ratings on the following dependent variables: attitudes, perceived usefulness, purchase intentions, sales, recommendation intention and source-related variables. In total, we identified 46 manuscripts that provided sufficient information to calculate effect sizes. Appendix A provides a list of these manuscripts. These manuscripts provide 214 effect size estimates.

Coding and Meta-analytic Procedure

We developed a coding protocol to specify the type of information to be extracted from the studies. The effect size metric selected for the meta-analysis is the correlation coefficient. As each effect size is a result of a comparison between positive and negative reviews (the positive review(s) is/are the treatment, while the negative review(s) is/are the control) or measured by product ratings, a positive correlation indicates that positive reviews have stronger effects than negative reviews, while a negative correlation indicates a stronger effect of negative reviews. We calculated effect sizes from a variety of data input types, following procedures in the literature (Lipsey and Wilson 2001). After compiling the data, we adjusted the effects from each study for unreliability (measurement error). When a study did not report the reliability or used a single-item measure for a relevant construct, we used the mean reliability for that construct across all studies for the reliability correction. Next, we transformed the reliability-corrected correlations into Fisher's z- coefficients. We averaged these z-scores and weighted them by the inverse of their variance following a random effects perspective before reconverting the integrated results.

The moderator variables are coded as described in Table 1. Because most studies compare the results for the dependent variables in positive reviews versus negative reviews, the moderator variable "positivity degree" is operationalized in two ways: (1) Positivity degree in the positive reviews (PDpos) is the percentage of positivity in the positive reviews, and (2) Positivity degree in the negative reviews (PDneg) is the percentage of positivity in the negative reviews. For example, if the positive reviews consist of three positive reviews and one negative review, and the negative reviews consists of one positive and three negative reviews, PDpos is coded 75% and PDneg is coded 25%. If a study compares one positive review and one negative review, PDpos is coded 100% and PDneg is coded 0%. When a study reports the average stars

rating of a set of reviews with the standard deviations, we approximate the positivity degree as follows: we use $(\text{mean} + \text{standard deviation}) / \text{scale maximum} * 100$ (in %) to code positivity degree in the positive review and $(\text{mean} - \text{standard deviation}) / \text{scale maximum} * 100$ (in %) to code positivity degree in the negative review. Out of 214 effect sizes, 90 effect sizes are from single reviews, 95 from set of reviews, and 20 from product ratings. Single review studies include two reviews, a positive and a negative one. Review sets have an average of 7.2 reviews for both the positive and negative review condition. The average percentage of negative reviews in the positive review set is 23.4 and in the negative review set it is 61.4. The average product rating on a scale from 1 to 5 is 3.84. These findings indicate that review sets and ratings tend to be more positive than negative. We further tested whether the approximations of positivity degree via product ratings lead to different results in the dependent variables than the direct computations from single reviews and review sets. We did not find any significant differences.

To test the hypotheses, we model the effect size estimates (the Fisher z-scores) related to usefulness and attitudes as a linear function of the moderator variables. We apply the random effects method of moments to conduct the meta-analysis following the recommendations in the literature (e.g., Lipsey and Wilson 2001) and common practice in meta-analyses in the marketing literature. Collinearity is always a major issue threatening the robustness in meta-analytic regression models. To check for collinearity, we regressed the z-scores related to attitude and usefulness on all of the moderators (PDpos, PDneg, Brand, Product Type and Country). For both dependent variables, both the tolerance (minimum tolerance = 0.349) and the VIF (maximum VIF = 2.866) indicate acceptable figures. Table B1 and B2 in the appendix provide correlation matrices between all moderators and the effect sizes related to perceived usefulness and attitudes.

RESULTS

Table 2 provides a summary of the mean effect sizes and the homogeneity analysis of the influence of valence on the dependent variables. The mean effect size is the strongest for recommendation intention ($r = .695$, $p < .001$), followed by attitude ($r = .334$, $p < .001$) and purchase intention ($r = .199$, $p = .001$). A t-test shows a significant difference between recommendation intention and purchase intention, indicating that online review valence influences consumers' recommendation behavior more than purchase decisions ($t(44) = 3.393$, $p = .007$). Furthermore, the mean effect sizes are marginally significant for sales ($r = .044$, $p = .073$) and not significant for perceived usefulness ($r = .049$, $p = .212$) and credibility ($r = .052$, $p = .353$), implying that on average valence does not have a significant influence on these variables.

The Q-statistics are significant for all variables ($p < .01$), indicating the presence of heterogeneity. This means that the variability in the effect sizes exceeds what would be expected from sampling error. The variability can be explained by substantial differences between studies and effect sizes. For that purpose, we apply moderator variables that describe differences between studies and effect sizes.

To account for a possible publication bias we calculated the fail-safe N for significant mean effect sizes ($p < .05$), that is, the number of unavailable (filed or future) studies providing null results that would reduce the mean effect size to a non-significant level. The high number of null results that would be necessary to render the findings non-significant shows that a possible omission of studies in our meta-analysis would not change the main conclusion of this review.

Table 2

Meta-analytic Effect Sizes, Z-test, Homogeneity Test and Fail-safe N

	# Effect Size	Mean effect size	Z- test	Q-statistics (Homogeneity test)	Fail-safe N
Attitude	62	.334	8.136***	908.368	4188
Perceived usefulness	63	.049	1.249	11044.689	N.A.
Purchase intention	37	.199	3.244**	677.286	6155
Recommendation intention	9	.695	6.701***	96.318	8548
Sales	18	.044	1.790*	1355.825	N.A.
Credibility	25	.052	.929	200.644	N.A.

***p < .01; **p < .05; *p < .10

Table 3 presents the results of random effects regression for perceived usefulness. The moderating influence of the positivity degree in the positive reviews is not significant, but the influence of the positivity degree in the negative reviews is significant. That is, the effect of valence is stronger with increasing positivity in the negative reviews. The findings support H1a: very negative reviews are less useful than slightly negative reviews.

Furthermore, product type is a significant moderator for the influence of review valence on perceived usefulness. Consistent with previous findings and our expectation, the effect of valence on perceived usefulness is stronger when the reviews involve experience ($r = .132$) rather than search product ($r = .001$). Therefore, H2a is accepted. Brand familiarity significantly moderates the influence of review valence on perceived usefulness; however, the direction of the effect is contradictory to our expectation. Our findings indicate that the influence of review

valence related to familiar brands ($r = .231$) is stronger than those related to unfamiliar brands ($r = -.020$). H3a is therefore rejected. Finally, as hypothesized, country is also a significant moderator for perceived usefulness. The effect sizes for perceived usefulness of studies conducted in the US ($r = .123$) are stronger than the effect sizes of studies conducted elsewhere ($r = .022$). H4a is therefore accepted.

Table 3
Results of the Random Effect Regression for Perceived Usefulness

	B	SE	Z	p	Beta
Constant	-.347	.240	-1.444	.149	
Positivity degree in positive reviews	-.001	.003	-.330	.741	-.030
Positivity degree in negative reviews	.004	.001	2.815	.005	.211
Product type: experience vs. other	.257	.080	3.200	.001	.271
Brand: familiar vs. unfamiliar	.362	.078	4.633	.001	.367
Cultural background: US vs. other	.382	.091	4.199	.001	.395

Table 4 presents the results of the random effect regression for attitude. In contrast to the result of perceived usefulness, the intercept is significant and positive and indicates that review valence has a positive effect on attitude. Moreover, the influence of the positivity degree in the positive reviews is significant while the influence of the positivity degree in the negative reviews is not. This means that the influence of valence on attitude is decreasing with increasing positivity in the positive reviews. The finding supports H1b: negative reviews lead to lower attitudes than positive ones, but if the reviews are too positive, attitudes decreases.

Furthermore, product type, brand familiarity and country do not affect the influence of review valence on attitude scores at the conventional level. The impact of valence on attitude is at best marginally stronger for search ($r = .556$) than experience good ($r = .390$) ($p = .097$).

Hence, H2b is rejected. As the results do not provide support for H3b (moderation by brand) and H4b (moderation by country), both hypotheses are rejected.

Table 4
Results of the Random Effect Regression for Attitude

	B	SE	Z	p	Beta
Constant	1.148	.340	3.373	.001	
Positivity degree in the positive review	-.008	.004	-1.949	.051	-.284
Positivity degree in the negative review	.000	.003	.089	.929	.014
Product type: experience vs. other	-.205	.124	-1.656	.098	-.201
Brand: familiar vs. unfamiliar	.047	.132	.352	.725	.049
Cultural background: USA vs. other	.173	.163	1.065	.287	.176

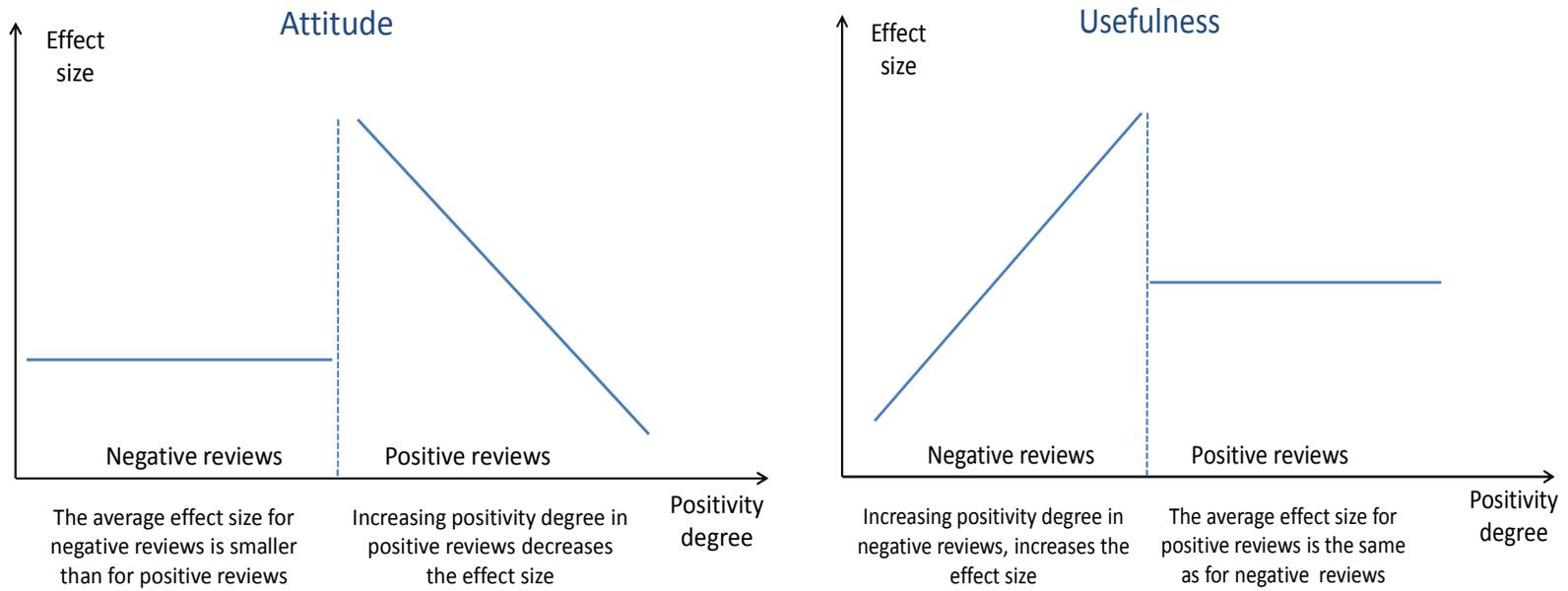
As an additional analysis, we checked for the possible confounding influence of several methodological moderators on the effect size, namely how the data were collected (study type), where the study was published, how valence was assessed in the primary studies (i.e., reviews or ratings), and for the total number of reviews and the items used to measure the dependent variable. We did not find any significant effects of study type (experimental study vs. field study: $F = 1.38$, $p = .241$), publication type (journal vs. other: $F = .361$, $p = .549$), valence type (single review set vs. set of several reviews vs. product rating: $F = 1.151$, $p = .318$), the number of reviews ($r = .046$, $p = .533$), or the number of measurement items ($r = .060$, $p = .405$).

DISCUSSION

Previous studies on the influence of review valence on consumers' evaluations in terms of perceived usefulness and attitude toward the reviewed object have shown mixed conclusions. This meta-analysis partly resolves these inconsistencies in the literature.

Figure 2

The Influence of Valence on Perceived Usefulness and Attitude



Review valence relates to perceived usefulness that is explained in Figure 2. The influence of review valence on perceived review usefulness is strongest for negative reviews that consider some strengths of the product. This implies that consumers perceive extremely negative reviews as less useful than more balanced negative reviews. In addition, for perceived usefulness, only the positivity degree in the negative reviews seems to matter. Consistent with the accessibility-diagnostics theory, as negative information is more diagnostic, it allows a more accurate assessment of a product and therefore, the negative reviews may weigh more than the positive reviews.

In line with our expectation, our results show that product type affects the influence of review valence on perceived usefulness of online reviews in the sense that valence has a stronger influence on perceived usefulness for experience products than for search products. Search products contain more objective elements that consumers can evaluate prior to purchase, while experience products contain more subjective elements that they cannot evaluate prior to purchase. Perceived risk and uncertainty increase along the search-experience product continuum. Therefore, for search products, the effect of review valence on review usefulness is limited, as consumers can assess product characteristics objectively. On the contrary, the assessment of an experience product involves more personal experience and subjective recommendation. As consumers cannot assess product quality prior to purchase, they have to rely on other customers' recommendation. As a result, the influence of review valence on perceived review usefulness is stronger for experience products than for search products.

Brand familiarity also moderates the influence of valence on perceived usefulness. However, contrary to our hypothesis, the influence of valence on perceived usefulness is stronger

when the brand is familiar than when the brand is not familiar. Some research suggests that knowledgeable readers reward product-relevant information with higher helpfulness assessments (Connors, Mudambi and Schuff 2011). As the reader has certain knowledge about a particular brand, it is perhaps easier to assess reviews in terms of their usefulness. In addition, also confirmation bias (i.e. the tendency to interpret information that confirms existing beliefs or expectations (Nickerson 1998)) can explain this phenomenon. Consumers, who are familiar with a brand, expect positive information. Negative information counters their expectations and may therefore be more surprising and helpful. Suppose a reader who holds a positive predisposition toward a certain brand and who reads positive reviews about the brand. Information consistency can be argued to trigger confirmation bias (Nickerson 1998), which then results in a strong cognitive response. Similarly, when this person reads negative reviews about the brand, the information inconsistency may lead the reader to develop counter arguments, which again results in a strong cognitive response (Pan and Zhang 2011; Sen and Lerman 2007). From this perspective, valence can have a stronger influence on perceived usefulness when the reviews involve a familiar brand than an unfamiliar brand.

Furthermore, results show that the influence of valence on perceived usefulness is greater for US consumers than for consumers elsewhere. Consistent with our expectation, US readers are highly individualistic, value and express own opinions, and are more receptive to e-commerce activities than consumers are from other countries. This suggests that US consumers rely more heavily on online recommendations and are more prone to and affected by review valence.

With regard to attitude, the significant mean effect size suggests that review valence has a positive effect on the attitude towards the object. The influence of valence on attitude is stronger when positive reviews do not only discuss the strengths of the product, but also its weaknesses.

Figure 2 depicts and explains this effect. Balanced positive reviews are more effective than merely positive reviews, because the inclusion of negative evaluations signals that the reviews are genuine and come from true customers (not marketers). The presence of negative reviews increases the credibility of the reviews as it indicates that they are not controlled or censored by a company. Positive reviews that contain such two-sided views may allow people to assess more accurately whether the weaknesses of the product are acceptable and the strengths of the product are good enough. However, for attitude, in contrast to perceived usefulness, it appears that only the positivity degree in the positive condition matters. Consistent with confirmation bias, people are more likely to consider information that is consistent with their beliefs or predisposition when forming an evaluation, leading consumers to give more weight to positive than negative reviews to form their attitudes and intentions.

Surprisingly, in contrast to our hypotheses and previous research (e.g., Vermeulen and Seegers 2009), our results indicate that the impact of review valence on attitude is not moderated by product type, brand familiarity or country. One reason might be the smaller heterogeneity in the findings compared to usefulness. That is, there is less variation to be explained, which reduces the likelihood of significant moderator effects. Next to this methodological explanation, there are substantial ones, too. Researchers have suggested that online reviews influence consumer behavior in two ways, depending on the readers' stage in the purchasing process (Lee, Park and Han 2008; Liu 2006). At the early "consider" phase, online reviews serve as informants, providing the readers with product- and user-related information, while at the later "evaluation" stage, they serve as recommenders providing the readers with a suggestion whether to buy the reviewed object. While the perceived usefulness of online reviews relates to the role of online reviews as informants, attitudes relate to the role of online reviews as recommenders.

In other words, in forming attitudes toward the reviewed object, consumers are only concerned with the role of online reviews as recommenders. Consequently, it is possible that the influence of product type, brand familiarity and cultural background applies to online reviews as informants but not as recommenders, and their influence diminishes once consumers reach the attitude formation stage. The development of our hypotheses indicates that the moderator effects differ between the consider phase and the evaluation stage and can lead to weaker effects in the evaluation stage (e.g., in the evaluation stage, variation in brand familiarity is presumably lower than in the consider phase, because consumers need to know a brand to evaluate it).

The influence of review valence on purchase intention is significant. Furthermore, the mean effect sizes show little to non-significant effects of valence on sales and credibility. Regarding sales, researchers have suggested that volume, rather than valence of reviews is more important in affecting sales. For credibility, it has been suggested that credibility assessment in the online environment is a complex matter. The extent of message consistency and virtual credentials (reviewer's past achievements), for instance, can be cues in determining credibility.

Finally, the influence of review valence on recommendation intention is very strong. People exposed to positive reviews reported systematically higher recommendation intention than those exposed to the negative ones. Online review valence explains almost 50 percent of the variation in recommendation behavior, but only ten percent in attitudes and less than five percent in purchase intentions. Obviously, other predictors have a stronger influence on attitudes and intentions than review valence (e.g., prior purchase behavior). This finding is important because prospect consumers base their decisions on other consumers' recommendations. Managing online reviews is therefore key for practitioners in influencing consumers' recommendations, but less important in influencing their purchase attitudes and intentions.

In conclusion, findings show that the influence of review valence differs for attitudes and usefulness: negative reviews that include some positive evaluations are most effective in influencing perceived usefulness, while positive reviews that include some negative evaluations are most effective in influencing attitudes. Additionally, review valence has a stronger influence on perceived usefulness when the reviews involve experience (rather than search) products, familiar (rather than unfamiliar) brands, and US consumers (rather than consumers elsewhere). These conclusions are quite robust, and unaffected by study, publication, or valence type.

Implications for Researchers

This meta-analysis adds to existing knowledge on the influence of review valence on consumers' evaluations by contrasting and combining results from existing studies. Our analyses show significant mean effect sizes for attitude, purchase intention and recommendation intention, indicating that review valence does significantly affect these three variables. On the other hand, based on the effect sizes found in earlier studies, we cannot conclude that review valence has an effect on perceived review usefulness, sales, and credibility.

The results of this study enhance prior knowledge by showing that not only valence plays a role, but the positivity degree of the reviews does too, as this affects perceived usefulness and consumer attitudes. Our study shows an effect of review valence that differs between usefulness and attitude (see figure 1). Negative reviews including a small amount of positivity result have the strongest effect on perceived usefulness, while positive reviews that provide some negativity are most effective in influencing attitudes. We also find that studies should consider the type of products and brands they test, as these moderate the effect of valence.

Our meta-analysis complements a recent meta-analysis on the relationship between online product reviews volume and valence on retail sales (Floyd et al. 2014). The meta-analysis by Floyd et al. investigates the effect of valence on sales by means of elasticities. An elasticity measures the magnitude of an effect (e.g., the increase in sales for one unit increase in valence) that can be meaningfully assessed for sales units that are mostly provided in field studies. In our meta-analysis, we focus on psychological outcomes (e.g., attitudes) and experimental studies, for which the explained variance as assessed by correlation coefficients is a more appropriate effect size. While mean effect sizes related to sales in our study resembles the significant finding by Floyd et al., we provide detailed results on the nature of valence effects by specifying valence in terms of positivity in different conditions, which can only be assessed in study designs that measure valence across different positivity conditions.

Can we use these findings to explain the effects of offline word of mouth? Prior research suggests that online and offline word of mouth differ in terms of interactivity, communication richness, and intimacy; that online word of mouth has social and functional drivers, but offline word of mouth has emotional drivers; that online information is more important for utilitarian products, while offline information is more important for hedonic products; and that the same methods lead to different results in both channels (Cheema and Papatla 2010; Lovett, Peres and Shachar 2013). These differences suggest that valence might lead to different effects such as driving emotions in an offline world, but providing useful and practical information in an online world. While the relationship between valence and emotions is linear (positivity increases positive emotions), the effects on usefulness is more complex as our findings suggest. Because of these differences, findings of online reviews from this study do not necessarily transfer to the offline world.

Practical Implications

The differential influence of review valence on usefulness and on attitude suggests that these two variables should not be placed under one common denominator. They indicate two separate goals in online activities. For instance, for website owners, it is perhaps more relevant that the reviews are perceived useful, because that may encourage people to visit the website again. If the goal is to maximize review usefulness, practitioners should be more cautious with extremely negative reviews, as this may reduce the perceived usefulness. In addition, practitioners should pay attention to product type, brand familiarity and cultural background as these variables moderate the influence of valence on usefulness.

As the influence of review valence on usefulness is stronger for experience products than for search products, sellers of search products can encourage their customer to post more experiential positive reviews. Using testimonials of how a smartphone can bring people together, or how a digital camera captures beautiful moments can create an experience around their products. This may boost review usefulness scores and encourage people to refer to the same website in the future, and/or to fellow consumers. Furthermore, the influence of valence on usefulness is stronger for familiar brands than for unfamiliar brands. Consumers sometimes engage in online search after they have purchased a product, for instance to reduce cognitive dissonance. It is therefore important to motivate people to share their experience with the product through online reviews. This emphasizes the importance of building relationship with the current customers, so they can advocate the brand, eventually convince, and persuade other potential customers. Finally, our findings suggest that valence has greater influence on usefulness for US consumers than for consumers from other countries. Practitioners should consider the cultural

background as it affects consumer behavior. For instance, in many places in the US, physical stores are not always available to purchase niche items. Additionally, many online stores offer free shipping for big purchases, and there is no sales tax on many online purchases in the US.

If the goal is to induce positive attitude, practitioners should be concerned with review valence, too. Regarding attitude, our study confirms that marketers and brand managers should not be afraid of negative reviews as long as the majority of reviews is positive. A small proportion of negative reviews increases attitude scores as it allows the reader to make an accurate assessment of both the strengths and weaknesses of the reviewed object. In addition, the presence of negative reviews may signal that the reviews are genuine and not censored by the company. Deleting negative reviews is thus, not recommended, as it may backfire rather than benefit the company.

The remarkable strong effect of valence on recommendation intention suggests that online review valence is an important tool to influence word-of-mouth behavior, which is usually a very difficult endeavor for practitioners. This is particularly important, because these passed on words affect future customers in their decision.

LIMITATIONS AND SUGGESTIONS FOR FURTHER RESEARCH

Several limitations that are common to meta-analytic reviews are also present here. This meta-analysis is limited by the availability of information in and the quality of the original studies. Due to an insufficient number of studies reporting on dependent variables such as purchase intention or sales, our moderator analysis is limited to perceived usefulness and attitude. The moderator analyses investigates the moderating influence of product type, brand familiarity and country only. More research is needed to understand how other moderators (e.g.,

reviewer characteristics, type of website, etc.) may influence the impact of online reviews on evaluations. These characteristics were not readily available in all studies that we considered for this meta-analysis. Further research could also apply other moderator categorizations. For instance, instead of using experience versus search categorization, further research could use services versus goods, or hedonic versus utilitarian categorization. Furthermore, our findings suggest that review valence has a stronger effect on recommendation than on purchase intention. More research is needed to provide a better understanding on the role of valence on recommendation intention (eWOM intention).

Another limitation refers to the variation in valence judgments across consumers that has been neglected in prior research and as a result in this meta-analysis, too. Information can have ambiguous valence and be positive to one person but negative to another. For instance, a hotel review that describes the location as a place where a lot is going on, might be welcome to some consumers but be avoided by others.

REFERENCES

- Ahluwalia, Rohini and Zeynep Gürhan-Canli (2000), "The Effects of Extensions on the Family Brand Name: An Accessibility-Diagnosticity Perspective," *Journal of Consumer Research*, 27, 3, 371-81.
- Bae, Soonyong and Taesik Lee (2011), "Gender Differences in Consumers' Perception of Online Consumer Reviews," *Electronic Commerce Research*, 11, 2, 201-14.
- Berger, J. A., A. T. Sorensen, and S. Rasmussen (2009), "Positive Effects of Negative Publicity: When Negative Reviews Increase Sales," *Marketing Science*, 29, 5, 815-27.
- Bronner, Fred and Robert De Hoog (2010), "Consumer Generated Versus Marketer Generated Websites in Consumer Decision Making," *International Journal of Market Research*, 52, 2, 231-48.
- Chakravarty, Anindita, Yong Liu, and Tridib Mazumdar (2010), "The Differential Effects of Online Word-of-Mouth and Critics' Reviews on Pre-Release Movie Evaluation," *Journal of Interactive Marketing*, 24, 3, 185-97.
- Cheema, Amar and Purushottam Papatla (2010), "Relative Importance of Online Versus Offline Information for Internet Purchases: Product Category and Internet Experience Effects," *Journal of Business Research*, 63, 979-85.
- Chen, Yubo and Jinhong Xie (2008), "Online Consumer Review: A New Element of Marketing Communications Mix," *Management Science*, 54, 3, 477-91.
- Cheung, Christy M. K. and Matthew K. O. Lee (2008), "Online Consumer Reviews: Does Negative Electronic Word-of-Mouth Hurt More?" in *Americas Conference on Information Systems (AMCIS)*, USA.

- Chevalier, Judith A. and Dina Mayzlin (2006), "The Effect of Word of Mouth on Sales: Online Book Reviews," *Journal of Marketing Research*, 43, 3, 345-54.
- Chiou, Jyh-Shen and Cathy Cheng (2003), "Should a Company Have Message Boards on Its Web Sites?," *Journal of Interactive Marketing*, 17, 3, 50-61.
- Connors, Laura, Susan M Mudambi, and David Schuff (2011), "Is It the Review or the Reviewer? A Multi-Method Approach to Determine the Antecedents of Online Review Helpfulness." in *System Sciences (HICSS), 2011 44th Hawaii International Conference on: IEEE*, 1-10.
- Doh, Sun-Jae and Jang-Sun Hwang (2009), "How Consumers Evaluate Ewom (Electronic Word-of-Mouth) Messages," *Cyberpsychology & Behavior*, 12, 2, 193-97.
- Duan, Wenjing, Bin Gu, and Andrew B. Whinston (2008), "Do Online Reviews Matter? An Empirical Investigation of Panel Data," *Decision Support Systems*, 45, 4, 1007-16.
- Edwards, Autumn, Chad Edwards, Carrie Shaver, and Mark Oaks (2009), "Computer-Mediated Word-of-Mouth Communication on RateMyProfessors. Com: Expectancy Effects on Student Cognitive and Behavioral Learning," *Journal of Computer-Mediated Communication*, 14, 2, 368-92.
- Eisend, Martin (2006), "Two-Sided Advertising: A Meta-Analysis," *International Journal of Research in Marketing*, 23, 2, 187-98.
- Feldman, Jack M. and John G. Lynch (1988), "Self-Generated Validity and Other Effects of Measurement on Belief, Attitude, Intention, and Behavior," *Journal of Applied Psychology*, 73, 3, 421-35.

- Floyd, Kristopher, Ryan Freling, Saad Alhoqail, Hyun Young Cho, and Traci Freling (2014), "How Online Product Reviews Affect Retail Sales: A Meta-Analysis," *Journal of Retailing*, 90, 2, 217-32.
- Forman, Chris, Anindya Ghose, and Batia Wiesenfeld (2008), "Examining the Relationship between Reviews and Sales: The Role of Reviewer Identity Disclosure in Electronic Markets," *Information Systems Research*, 19, 3, 291-313.
- Herr, Paul M., Frank R. Kardes, and John Kim (1991), "Effects of Word-of-Mouth and Product-Attribute Information on Persuasion - an Accessibility-Diagnosticity Perspective," *Journal of Consumer Research*, 17, 4, 454-62.
- Hofstede, Geert (2001), *Culture's Consequences (2nd Ed.)*. CA: Thousand Oaks, Sage Publications.
- Hong, Seoyeon and Hee Sun Park (2012), "Computer-Mediated Persuasion in Online Reviews: Statistical Versus Narrative Evidence," *Computers in Human Behavior*, 28, 3, 906-19.
- Huang, Huiping (2005), "A Cross-Cultural Test of the Spiral of Silence." *International Journal of Public Opinion Research*, 17, 3, P. 324 – 345., " *International Journal of Public Opinion Research*, 17, 3, 324-45.
- Joseph, Damien, Kok-Yee Ng, Christine Koh, and Soon Ang (2007), "Turnover of Information Technology Professionals: A Narrative Review, Meta-Analytic Structural Equation Modeling, and Model Development," *MIS Quarterly*, 31, 3, 547-77.
- Koh, Noi Sian, Nan Hu, and Eric K. Clemons (2010), "Do Online Reviews Reflect a Product's True Perceived Quality? An Investigation of Online Movie Reviews across Cultures," *Electronic Commerce Research and Applications*, 9, 5, 374-85.

- Lee, Jumin, Do-Hyung Park, and Ingoo Han (2008), "The Effect of Negative Online Consumer Reviews on Product Attitude: An Information Processing View," *Electronic Commerce Research and Applications*, 7, 3, 341-52.
- Lee, Mira and Seounmi Youn (2009), "Electronic Word of Mouth (Ewom)," *International Journal of Advertising*, 28, 3, 473-99.
- Lipsey, Mark W and David B Wilson (2001), *Practical Meta-Analysis*. SAGE Publications, Incorporated.
- Liu, Yong (2006), "Word-of-Mouth for Movies: Its Dynamics and Impact on Box Office Revenue," *Journal of Marketing*, 70, 3, 74-89.
- Lovett, Mitchell J., Renana Peres, and Ron Shachar (2013), "On Brands and Word of Mouth," *Journal of Marketing Research*, 50, August, 427-44.
- Mudambi, Susan M. and David Schuff (2010), "What Makes a Helpful Online Review? A Study of Customer Reviews on Amazon.Com," *MIS Quarterly*, 34, 1, 185-200.
- Nelson, Phillip (1970), "Information and Consumer Behavior," *Journal of Political Economy*, 78, 2, 311-29.
- Nickerson, Raymond S (1998), "Confirmation Bias: A Ubiquitous Phenomenon in Many Guises," *Review of General Psychology*, 2, 2, 175.
- Pan, Yue and Jason Q Zhang (2011), "Born Unequal: A Study of the Helpfulness of User-Generated Product Reviews," *Journal of Retailing*, 87, 4, 598-612.
- Park, Cheol and Thae M. Lee (2009), "Information Direction, Website Reputation and Ewom Effect: A Moderating Role of Product Type," *Journal of Business Research*, 62, 1, 61-67.
- Park, Se-Bum and Do-Hyung Park (2013), "The Effect of Low-Versus High-Variance in Product Reviews on Product Evaluation," *Psychology & Marketing*, 30, 7, 543-54.

- Pratto, Felicia and Oliver P. John (1991), "Automatic Vigilance: The Attention-Grabbing Power of Negative Social Information," *Journal of Personality and Social Psychology*, 61, 3, 380-91.
- Purnawirawan, Nathalia, Patrick De Pelsmacker, and Nathalie Dens (2012), "Balance and Sequence in Online Reviews: How Perceived Usefulness Affects Attitudes and Intentions," *Journal of Interactive Marketing*, 26, 4, 244-55.
- Purnawirawan, Nathalia, Nathalie Dens, and Patrick De Pelsmacker (2012), "Balance and Sequence in Online Reviews: The Wrap Effect," *International Journal of Electronic Commerce*, 17, 2, 71-98.
- Sen, Shahana and Dawn Lerman (2007), "Why Are You Telling Me This? An Examination into Negative Consumer Reviews on the Web," *Journal of Interactive Marketing*, 21, 4, 76-94.
- Skowronski, John J. and Donal E. Carlston (1989), "Negativity and Extremity Biases in Impression Formation: A Review of Explanations," *Psychological Bulletin*, 105, 1, 131-42.
- Sohn, Dongyoung (2009), "Disentangling the Effects of Social Network Density on Electronic Word-of-Mouth (Ewom) Intention," *Journal of Computer-Mediated Communication*, 14, 2, 352-67.
- Sparks, Beverley A. and Victoria Browning (2011), "The Impact of Online Reviews on Hotel Booking Intentions and Perception of Trust," *Tourism Management*, 32, 6, 1310-23.
- Tsang, A. S. L. and G. Prendergast (2009), "Is a "Star" Worth a Thousand Words? The Interplay between Product-Review Texts and Rating Valences," *European Journal of Marketing*, 43, 11-12, 1269-80.

- Utz, Sonja, Peter Kerkhof, and Joost van den Bos (2012), "Consumers Rule: How Consumer Reviews Influence Perceived Trustworthiness of Online Stores," *Electronic Commerce Research and Applications*, 11, 1, 49-58.
- Vermeulen, Ivar E. and Daphne Seegers (2009), "Tried and Tested: The Impact of Online Hotel Reviews on Consumer Consideration," *Tourism Management*, 30, 1, 123-27.
- Willemsen, Lotte M., Peter C. Neijens, Fred Bronner, and Jan A. de Ridder (2011), "'Highly Recommended!' The Content Characteristics and Perceived Usefulness of Online Consumer Reviews," *Journal of Computer-Mediated Communication*, 17, 1, 19-38.
- Wu, Jiming and Albert Lederer (2009), "A Meta-Analysis of the Role of Environment-Based Voluntariness in Information Technology Acceptance," *MIS Quarterly*, 33, 2, 419-32.
- Wu, Philip Fei, Hans Van der Heijden, and Nikolaos Korfiatis (2011), "The Influences of Negativity and Review Quality on the Helpfulness of Online Reviews." in *ICIS 2011 Proceedings*.
- Xia, Lan and Nada Nasr Bechwati (2008), "Word of Mouse: The Role of Cognitive Personalization in Online Consumer Reviews," *Journal of Interactive Advertising*, 9, 1, 3-13.
- Zhu, Feng and Xiaoquan Zhang (2010), "Impact of Online Consumer Reviews on Sales: The Moderating Role of Product and Consumer Characteristics," *Journal of Marketing*, 74, 2, 133-48.
- Zou, Peng, Bo Yu, and Yuanyuan Hao (2011), "Does the Valence of Online Consumer Reviews Matter for Consumer Decision Making? The Moderating Role of Consumer Expertise," *Journal of Computers*, 6, 3, 484-88.

APPENDIX A

Table A1

Studies included in the Meta-Analysis

No.	Author, Year	Study provides effect sizes of valence influence on...					
		Usefulness	Attitude	Intention	Recommen- dation intentions	Sales	Credibility
1	Bae and Lee 2011,			x			
2	Berger, Sorensen and Rasmussen 2009,		x	x		x	
3	Bussiere 2009,	x		x	x		x
4	Chakravarty, Liu and Mazumdar 2010,		x				
5	Chen, Wang and Xie 2010,					x	
6	Cheung and Lee 2008,			x			x
7	Cheung et al. 2009,	x					
8	Chevalier and Mayzlin 2006,					x	
9	Chintagunta, Gopinath and Venkataraman 2010,					x	
10	Connors, Mudambi and Schuff 2011,	x					
11	Derks, Bos and von Grumbkow 2007,			x			
12	Doh and Hwang 2009,		x	x			x
13	Duan, Gu and Whinston 2008,					x	
14	Edwards et al. 2009,		x				x
15	Forman, Ghose and Wiesenfeld	x				x	

	2008,						
16	Hao et al. 2010,	x					
17	Hong and Park 2012,		x				x
18	Hu, Liu and Zhang 2008,					x	
19	Huang and Chen 2006,				x		
20	Lee and Lee 2009,		x		x		
21	Lee, Park and Han 2008,		x				
22	Lee and Youn 2009,					x	
23	Liu 2006,						x
24	Moe 2009,						x
25	Pan and Zhang 2011,	x					
26	Park and Lee 2009,	x					
27	Purnawirawan, De Pelsmacker and Dens 2012,	x					
28	Purnawirawan, Dens and De Pelsmacker 2012,		x				
29	Sen and Lerman 2007,	x	x				x
30	Sohn 2009,	x				x	
31	Sparks and Browning 2011,		x		x		
32	Tsang and Prendergast 2009,	x			x		x
33	Utz, Kerkhof and van den Bos 2012,						x
34	Vermeulen and Seegers 2009,		x				
35	Walther et al. 2010,		x		x		
36	Willemsen et al. 2011,	x					
37	Wu, Van der Heijden and Korfiatis 2011,	x					
38	Xia and Bechwati 2008,	x			x		
39	Yang et al. 2012,						x
40	Yang and Mai 2010,		x				

41	Ye, Law and Gu 2009,				x
42	Zehrer, Crotts and Magnini 2011,	x			
43	Zhang and Dellarocas 2006,				x
44	Zhang, Craciun and Shin 2010,	x			
45	Zhang et al. 2010,			x	
46	Zou, Yu and Hao 2011,	x			

1. Bae, Soonyong and Taesik Lee (2011), "Gender Differences in Consumers' Perception of Online Consumer Reviews," *Electronic Commerce Research*, 11, 2, 201-14.
2. Berger, J. A., A. T. Sorensen, and S. Rasmussen (2009), "Positive Effects of Negative Publicity: When Negative Reviews Increase Sales," *Marketing Science*, 29, 5, 815-27.
3. Bussiere, Dave (2009), "The Effects of Humor on the Processing of Word-of-Mouth," *Advances in Consumer Research*, 36.
4. Chakravarty, Anindita, Yong Liu, and Tridib Mazumdar (2010), "The Differential Effects of Online Word-of-Mouth and Critics' Reviews on Pre-Release Movie Evaluation," *Journal of Interactive Marketing*, 24, 3, 185-97.
5. Chen, Yubo, Qi Wang, and Jinhong Xie (2010), "Online Social Interactions: A Natural Experiment on Word of Mouth Versus Observational Learning," *Available at SSRN 1501843*.
6. Cheung, Christy M. K. and Matthew K. O. Lee (2008), "Online Consumer Reviews: Does Negative Electronic Word-of-Mouth Hurt More?" in *Americas Conference on Information Systems (AMCIS)*, USA.
7. Cheung, Man Y., Chuan Luo, Choon L. Sia, and Huaping Chen (2009), "Credibility of Electronic Word-of-Mouth: Informational and Normative Determinants of on-Line Consumer Recommendations," *International Journal of Electronic Commerce*, 13, 4, 9-38.
8. Chevalier, Judith A. and Dina Mayzlin (2006), "The Effect of Word of Mouth on Sales: Online Book Reviews," *Journal of Marketing Research*, 43, 3, 345-54.
9. Chintagunta, Pradeep K., Shyam Gopinath, and Sriram Venkataraman (2010), "The Effects of Online User Reviews on Movie Box Office Performance: Accounting for Sequential Rollout and Aggregation across Local Markets," *Marketing Science*, 29, 5, 944-57.
10. Connors, Laura, Susan M Mudambi, and David Schuff (2011), "Is It the Review or the Reviewer? A Multi-Method Approach to Determine the Antecedents of Online Review Helpfulness." in *System Sciences (HICSS), 2011 44th Hawaii International Conference on: IEEE*, 1-10.
11. Derks, Daantje, Arjan E. R. Bos, and Jasper von Grumbkow (2007), "Emoticons and Social Interaction on the Internet: The Importance of Social Context," *Computers in Human Behavior*, 23, 1, 842-49.
12. Doh, Sun-Jae and Jang-Sun Hwang (2009), "How Consumers Evaluate Ewom (Electronic Word-of-Mouth) Messages," *Cyberpsychology & Behavior*, 12, 2, 193-97.
13. Duan, Wenjing, Bin Gu, and Andrew B. Whinston (2008), "Do Online Reviews Matter? An Empirical Investigation of Panel Data," *Decision Support Systems*, 45, 4, 1007-16.
14. Edwards, Autumn, Chad Edwards, Carrie Shaver, and Mark Oaks (2009), "Computer-Mediated Word-of-Mouth Communication on Ratemyprofessors. Com: Expectancy Effects on Student Cognitive and Behavioral Learning," *Journal of Computer-Mediated Communication*, 14, 2, 368-92.
15. Forman, Chris, Anindya Ghose, and Batia Wiesenfeld (2008), "Examining the Relationship between Reviews and Sales: The Role of Reviewer Identity Disclosure in Electronic Markets," *Information Systems Research*, 19, 3, 291-313.
16. Hao, Yuan Yuan, Qiang Ye, Yi Jun Li, and Zhuo Cheng (2010), "How Does the Valence of Online Consumer Reviews Matter in Consumer Decision Making? Differences

- between Search Goods and Experience Goods." in *System Sciences (HICSS), 2010 43rd Hawaii International Conference on: IEEE*, 1-10.
17. Hong, Seoyeon and Hee Sun Park (2012), "Computer-Mediated Persuasion in Online Reviews: Statistical Versus Narrative Evidence," *Computers in Human Behavior*, 28, 3, 906-19.
 18. Hu, Nan, Ling Liu, and Jennifer Zhang (2008), "Do Online Reviews Affect Product Sales? The Role of Reviewer Characteristics and Temporal Effects," *Information Technology and Management*, 9, 201-14.
 19. Huang, Jen-Hung and Yi-Fen Chen (2006), "Herding in Online Product Choice," *Psychology and Marketing*, 23, 5, 413-28.
 20. Lee, Jumin, Do-Hyung Park, and Ingoo Han (2008), "The Effect of Negative Online Consumer Reviews on Product Attitude: An Information Processing View," *Electronic Commerce Research and Applications*, 7, 3, 341-52.
 21. Lee, Jung and Jae-Nam Lee (2009), "Understanding the Product Information Inference Process in Electronic Word-of-Mouth: An Objectivity-Subjectivity Dichotomy Perspective," *Information and Management*, 46, 302-11.
 22. Lee, Mira and Seounmi Youn (2009), "Electronic Word of Mouth (Ewom)," *International Journal of Advertising*, 28, 3, 473-99.
 23. Liu, Yong (2006), "Word-of-Mouth for Movies: Its Dynamics and Impact on Box Office Revenue," *Journal of Marketing*, 70, 3, 74-89.
 24. Moe, W (2009), "How Much Does a Good Product Rating Help a Bad Product? Modeling the Role of Product Quality in the Relationship between Online Consumer Ratings and Sales." in: Working Paper, University Of Maryland College Park.
 25. Pan, Yue and Jason Q Zhang (2011), "Born Unequal: A Study of the Helpfulness of User-Generated Product Reviews," *Journal of Retailing*, 87, 4, 598-612.
 26. Park, Cheol and Thae M. Lee (2009), "Information Direction, Website Reputation and Ewom Effect: A Moderating Role of Product Type," *Journal of Business Research*, 62, 1, 61-67.
 27. Purnawirawan, Nathalia, Patrick De Pelsmacker, and Nathalie Dens (2012), "Balance and Sequence in Online Reviews: How Perceived Usefulness Affects Attitudes and Intentions," *Journal of Interactive Marketing*, 26, 4, 244-55.
 28. Purnawirawan, Nathalia, Nathalie Dens, and Patrick De Pelsmacker (2012), "Balance and Sequence in Online Reviews: The Wrap Effect," *International Journal of Electronic Commerce*, 17, 2, 71-98.
 29. Sen, Shahana and Dawn Lerman (2007), "Why Are You Telling Me This? An Examination into Negative Consumer Reviews on the Web," *Journal of Interactive Marketing*, 21, 4, 76-94.
 30. Sohn, Dongyoung (2009), "Disentangling the Effects of Social Network Density on Electronic Word-of-Mouth (Ewom) Intention," *Journal of Computer-Mediated Communication*, 14, 2, 352-67.
 31. Sparks, Beverley A. and Victoria Browning (2011), "The Impact of Online Reviews on Hotel Booking Intentions and Perception of Trust," *Tourism Management*, 32, 6, 1310-23.
 32. Tsang, A. S. L. and G. Prendergast (2009), "Is a "Star" Worth a Thousand Words? The Interplay between Product-Review Texts and Rating Valences," *European Journal of Marketing*, 43, 11-12, 1269-80.

33. Utz, Sonja, Peter Kerkhof, and Joost van den Bos (2012), "Consumers Rule: How Consumer Reviews Influence Perceived Trustworthiness of Online Stores," *Electronic Commerce Research and Applications*, 11, 1, 49-58.
34. Vermeulen, Ivar E. and Daphne Seegers (2009), "Tried and Tested: The Impact of Online Hotel Reviews on Consumer Consideration," *Tourism Management*, 30, 1, 123-27.
35. Walther, J. B., D. DeAndrea, J. Kim, and J. C. Anthony (2010), "The Influence of Online Comments on Perceptions of Antimarijuana Public Service Announcements on Youtube," *Human Communication Research*, 36, 4, 469-92.
36. Willemsen, Lotte M., Peter C. Neijens, Fred Bronner, and Jan A. de Ridder (2011), "'Highly Recommended!' The Content Characteristics and Perceived Usefulness of Online Consumer Reviews," *Journal of Computer-Mediated Communication*, 17, 1, 19-38.
37. Wu, Philip Fei, Hans Van der Heijden, and Nikolaos Korfiatis (2011), "The Influences of Negativity and Review Quality on the Helpfulness of Online Reviews." in *ICIS 2011 Proceedings*.
38. Xia, Lan and Nada Nasr Bechwati (2008), "Word of Mouse: The Role of Cognitive Personalization in Online Consumer Reviews," *Journal of Interactive Advertising*, 9, 1, 3-13.
39. Yang, Joonhyuk, Wonjoon Kim, Naveen Ambler, and Jaeseung Jeong (2012), "The Heterogeneous Effect of WOM on Product Sales: Why the Effect of WOM Valence Is Mixed?," *European Journal of Marketing*, 46, 11/12, 1523-38.
40. Yang, Jun and Enping Shirley Mai (2010), "Experiential Goods with Network Externalities Effects: An Empirical Study of Online Rating System," *Journal of Business Research*, 63, 9, 1050-57.
41. Ye, Qiang, Rob Law, and Bin Gu (2009), "The Impact of Online User Reviews on Hotel Room Sales," *International Journal of Hospitality Management*, 28, 1, 180-82.
42. Zehrer, Anita, John C Crotts, and Vincent P Magnini (2011), "The Perceived Usefulness of Blog Postings: An Extension of the Expectancy-Disconfirmation Paradigm," *Tourism Management*, 32, 1, 106-13.
43. Zhang, Jason Q, Georgiana Craciun, and Dongwoo Shin (2010), "When Does Electronic Word-of-Mouth Matter? A Study of Consumer Product Reviews," *Journal of Business Research*, 63, 12, 1336-41.
44. Zhang, Xiaoquan and Chrysanthos Dellarocas (2006), "The Lord of the Ratings: Is a Movie's Fate Is Influenced by Reviews?."
45. Zhang, Z. Q., Q. A. Ye, R. Law, and Y. J. Li (2010), "The Impact of E-Word-of-Mouth on the Online Popularity of Restaurants: A Comparison of Consumer Reviews and Editor Reviews," *International Journal of Hospitality Management*, 29, 4, 694-700.
46. Zou, Peng, Bo Yu, and Yuanyuan Hao (2011), "Does the Valence of Online Consumer Reviews Matter for Consumer Decision Making? The Moderating Role of Consumer Expertise," *Journal of Computers*, 6, 3, 484-88.

APPENDIX B

Table B1

Correlation Matrix: Perceived Usefulness

		1	2	3	4	5	6
1	Perceived usefulness	1					
2	Percentage of positivity in the positive review	.054	1				
3	Percentage of positivity in the negative review	.169	-.044	1			
4	Product type: Experience vs. other (search)	.134	-.503	.064	1		
5	Brand: known vs. unknown	.241	.085	.199	-.067	1	
6	Culture: USA vs. other	.101	.489	-.307	-.412	-.319	1

Table B2

Correlation matrix: Attitude

		1	2	3	4	5	6
1	Attitude	1					
2	Percentage of positivity in the positive review	-.134	1				
3	Percentage of positivity in the negative review	.007	-.276	1			
4	Product type: Experience vs. other (search)	-.163	-.172	-.235	1		
5	Brand: known vs. unknown	-.145	.509	-.260	.326	1	
6	Culture: USA vs. other	.066	.483	-.670	-.167	.065	1