

## **Gender Differences in Online Customer Satisfaction: The Asymmetric and Nonlinear**

### **Effect**

### **Abstract**

The article aims to determine the extent of gender-related differences in user satisfaction with websites with a focus on the asymmetric and nonlinear effects of customer satisfaction. An experiment was conducted with 15 men and 15 women who undertook a typical task (scenario) on 44 websites. Overall, 1,320 evaluations of website quality attributes were obtained and analyzed. The results reveal that men and women differ in their website quality assessment. Marketing professionals should consider their target audience's gender when designing a quality website, or even devise ways of approaching both gender groups through distinct means.

### **Introduction**

Customer satisfaction has been among the most researched phenomena in marketing in recent decades (Oliver, 2010). Orientation toward customer satisfaction is the core driver of company performance and directly influences customer retention and loyalty (Kotler, 2014). Among the characteristics of customer satisfaction, nonlinearity and asymmetry play a prominent role (Anderson & Sullivan, 1993; LaBarbera & Mazursky, 1983). The asymmetry of consumer satisfaction is based on different customer responses to the positive/negative performance of a product or service. Negative performance is perceived as more salient, resulting in higher levels of dissatisfaction – in comparison to the same level of positive performance, which is given less weight and elicits weaker response in consumer satisfaction. Furthermore, the literature outlines a decreasing sensitivity in customers' responses to extreme levels of product performance (the impact of changes on consumer satisfaction diminishes towards to the higher/lower levels of product performance), suggesting a nonlinear relationship between

*This is an Accepted Manuscript of an article published by Taylor & Francis Group in Services Marketing Quarterly on 08 Jun 2018, available online: <https://www.tandfonline.com/doi/full/10.1080/15332969.2018.1471954>.* attribute-level product performance and the customers' overall satisfaction (Anderson & Mittal, 2000).

The asymmetry and nonlinearity of consumer satisfaction have been previously confirmed in many different fields and industries, e.g., the automotive industry (Mittal, Ross Jr, & Baldasare, 1998), the food industry (Oliva, Oliver, & Bearden, 1995), banking (Colgate & Danaher, 2000), education (Söderlund, 1998), and healthcare (Mittal *et al.*, 1998). Similar asymmetry and nonlinearity have also been observed in the online environment in the relationship between website attributes and the level of user satisfaction (Cheung & Lee, 2005, 2009; Jarvenpaa & Todd, 1996; McKinney & Yoon, 2002; Rai, Lang, & Welker, 2002; P. Zhang & Von Dran, 2000).

Interconnectedness between user experience and their satisfaction could be impacted by other characteristics related to users themselves, and their background, geographic, or demographic factors, among which gender has been confirmed as a significant factor in both offline (Helgesen & Nettet, 2010) and online settings (Deng, Lu, Wei, & Zhang, 2010). Females and males express their satisfaction or dissatisfaction for different reasons and with varying intentions (Baggini, 2010). Female customers may be more critical overall (Wolfe & Powell, 2009) and change their satisfaction perceptions more substantially over time as they interact with a service or a product (Bendall-Lyon & Powers, 2002). The nature of the response of males and females to customer satisfaction attributes in the online environment, however, has been largely neglected by previous research and this dearth serves as a primary motivational driver for this study.

The study seeks to contribute to the debate about gender-related impact on consumer satisfaction by addressing the research question: *Does user satisfaction with a website show an asymmetric and nonlinear effect for both genders? If so, Is there a difference in the size of these effects for men and women?*

The remainder of this article is structured as follows. In the next section, a literature review focuses on the key domains relevant to the study, building our ideas upon the theoretical bases of Prospect Theory, Expectation-Disconfirmation Theory, and the Kano model along the lines of gender-caused variation uncovered in previous research. This leads to the development of research hypotheses about assuming the nature of gender-caused relationships across customer satisfaction attributes with a website. The methodology section then describes the experimental design, where respondents assess a website, then perform a randomly assigned typical activity, and assess the particular website again. This is followed by the results discussing the empirical evidence. In the discussion section, results are linked to the literature and to the outlined hypotheses. The article concludes with the study main contribution to marketing theory and practice.

### **Literature Review**

First, this section discusses the common theories and conceptualizations regarding the asymmetric and nonlinear nature of customer satisfaction contingent on relevant customer expectations, specifically in the online environment where users are the primary customers. Second, various types of websites vis-a-vis user expectations are distinguished. Third, gender-relevant factors impacting the relationship between customer satisfaction and website performance are examined.

An explanation of the asymmetric and nonlinear relationship between attribute-level product performance and overall customer satisfaction can be found in prospect theory (Kahneman & Tversky, 1979). Prospect theory is a critique of the expected utility concept and suggests that people make decisions based not on the overall value of the total outcome, but rather on the potential value of losses and gains. The value function in prospect theory is defined as the distance from a reference point; the function is concave for gains (suggesting risk aversion)

and convex for losses (risk seeking). Losses are also expected to loom larger than gains (Anderson & Sullivan, 1993).

Further explanation of the nature of customer satisfaction is offered by expectation disconfirmation theory (Oliver, 2010). This cognitive model explains satisfaction as a function of expectations, perceived performance, and disconfirmation of beliefs. When a product outperforms the original expectations, the disconfirmation is positive, which results in an increase in customer satisfaction. When the product performance fails to meet prepurchase expectations, the disconfirmation is negative, which results in an increase in customer dissatisfaction. The satisfaction function is similar in form to the value function suggested by prospect theory. Many studies have also suggested a gender-related difference in customer reaction to the gap between expectations and disconfirmation (Chan, Cheung, Shi, & Lee, 2015; Oliver & Linda, 1981; Shi, Cheung, Lee, & Chen, 2009).

However, not all product attributes contribute to consumer satisfaction and affect customer response to product performance in the same way. Some attributes are considered basic—that is, they do not increase satisfaction when present, but result in dissatisfaction when not fulfilled. Other attributes can reduce customer satisfaction when absent, or exhibit weak performance, but can positively influence customer satisfaction when the product performs well on such attributes. Some attributes can also be unspoken or unexpected by customers, and can result in high levels of customer satisfaction, delight, and excitement when present—nevertheless, their absence does not lead to dissatisfaction. Many authors have distinguished between various types of product attributes (Vargo, Nagao, He, & Morgan, 2007), e.g., Herzberg, Mausner, and Snyderman (1993), Cadotte and Turgeon (1988), Randall (1988), Oliver (1995), and Kano, Seraku, Takahashi, and Tsuji (1984). Since its introduction, the Kano model has emerged as one of the most widely used concepts in customer satisfaction (Mikulić, 2007). In the Kano model of customer satisfaction, the relationship between product performance and the

importance of basic and excitement attributes is also nonlinear and asymmetric. Basic attributes are crucial when the product performance is low. Their impact on overall satisfaction is reduced as product performance increases. The excitement factors work in the opposite direction—their importance grows with the performance of the product, whereas they become irrelevant when the product performance stays low (Matzler, Bailom, Hinterhuber, Renzl, & Pichler, 2004). Kano *et al.* (1984) distinguish between indifferent attributes (which do not result in either customer satisfaction or customer dissatisfaction) and reverse attributes (high levels of performance may even result in dissatisfaction—e.g., when the customer is overwhelmed by product features).

### **Hypothesis development**

A question, which this paper attempts to contribute to answering, is how and to what extent gender is a determinant of customer satisfaction in the online setting. Gender plays an important role in the assessment of customer satisfaction in the online, as well as offline, context. Some studies (e.g. Cooil, Keiningham, Aksoy, & Hsu, 2007; Laroche, Choi, Lee, Kim, & Lee, 2005) find no gender-caused variation in satisfaction and loyalty levels, and do not even identify a moderating effect (Walsh, Evanschitzky, & Wunderlich, 2008). Gender, however, could become an important differentiating variable when assessing satisfaction levels, especially for extreme (Johnson, Kulesa, Cho, & Shavitt, 2005) and middle (Harzing, 2006) response styles. A significant gender-related difference in consumer satisfaction has been connected to various levels of product performance (Deng *et al.*, 2010).

Men and women express their dissatisfaction differently. On the one hand, males may be more likely to complain when it comes to expressing dissatisfaction (Huang, Huang, & Wu, 1996). On the other, historical studies express an opinion that females could complain more often than males, as they consume products and services more frequently (Liefeld, Edgecombe, & Wolfe,

1975). More recently, Heung and Lam (2003) find that female customers are more frequent complainers in relative terms.

Some advocate that gender has a moderating effect on satisfaction (Sharma, Chen, & Luk, 2012), while others propose that gender is an issue for customer satisfaction only when combined with other antecedents, such as customer expectations and brand loyalty (Moutinho & Goode, 1995), and still others find a direct influence (Helgesen & Nettet, 2010). Beyond satisfaction, material gender-related differences have been identified in repurchase intent according to the perceived value of a product (Frank, Enkawa, & Schvaneveldt, 2014) or in a satisfaction–loyalty link. Other scholars control for gender and report no difference in complaint behaviors or customer evaluations (Jones, McCleary, & Lepisto, 2002; Mattila, 2000) or even deny any gender impact on the asymmetric effect of customer satisfaction (Colgate & Danaher, 2000; Laroche et al., 2005). Hence, we formulate the research hypotheses:

H1 Female satisfaction with website performance is more sensitive to negative disconfirmation compared to male satisfaction with website performance.

H2 Male satisfaction with website performance is more sensitive to positive disconfirmation compared to female satisfaction with website performance.

H3 Changes in user satisfaction with a website are nonlinear and asymmetric compared to changes in perceived website performance.

## **Method**

The experiment design builds on testing with real users, which carries the most relevant outputs (Barnum, 2010). Alternatively, websites can be assessed through expert evaluation or complemented by other methods, such as automated tools or website analytics (Zahran, Al-Nuaim, Rutter, & Benyon, 2014). For user-centered approaches, the core assumption is that the respondents belong to the target group of websites used for testing and that the testing scenario

reflects typical tasks and activities that users undertake on such websites (Leavitt & Shneiderman, 2006; Nielsen, 2004; Waite, 2006).

Websites vary in terms of type and function: whereas some are commercial, others are geared towards service, or have mixed uses (Cebi, 2013). Most studies to date focus on commercial websites, where the main goal is to convince the user to shop. This study concerns tertiary education institution websites, which provide informational services and, hence, are primarily for information retrieval.

One of the most common target groups for higher education institutions is their own students, who typically perform information-seeking tasks. Although there is an argument that students are a rather narrow data source, “student subjects do *not* intrinsically pose a problem for a study’s external validity” (Druckman & Kam, 2009, p. 1, emphasis original). The experiment was based on a survey among university students to compare their evaluations of selected website attributes before and after they undertook the assigned task and acquired personal experience with the website. The survey methodology, as utilized in this study, is the most frequently used research approach to website evaluation (Chiou, Lin, & Perng, 2010).

First, a randomly generated higher education institution’s website was presented to the informant. The selected website (homepage screenshot) was displayed for five seconds. At that point, the user had no idea whether they would even be able to complete the assigned task. The user’s impression was based entirely on the visual appearance of the website. In spite of a short screenshot display, the user created an initial expectation about the website’s usability, content, and ability to perform a typical task (Leavitt & Shneiderman, 2006). Some (even complex) attributes can be recognized as early as within 50 milliseconds (Lindgaard, Fernandes, Dudek, & Brown, 2006). However, the users in this study were given a hundred times longer frame to perceive the website (five seconds). After the initial experience, users were asked to evaluate selected website attributes.

There is a plethora of frameworks for assessing user-relevant website parameters. Chiou *et al.* (2010) perform a literature review of papers published in the years 1995–2006 to capture the trends in prevailing website evaluation criteria used in academic studies. Cebi (2013) extends the literature review beyond 2006 and reviews the most recent studies and approaches. Both (Cebi, 2013; Chiou *et al.*, 2010) agree that the most commonly addressed attributes are website navigation (ease of navigation), website layout (logical structure), website content (content relevancy and usefulness, information quality), and visual appeal (attractiveness—i.e., visual design, visual aesthetics, appealing design). Specific attributes contributing to the user's positive/negative satisfaction are not solely limited to the effectiveness of user activities (whether users have achieved their goals for which they visited the website; e.g., information retrieval) (Hassenzahl & Tractinsky, 2006) but extend to visual aspects of the website (e.g., esthetic appeal, interactiveness, simplicity, or personalization) (Moshagen & Thielsch, 2010). Lindgaard *et al.* (2006) establish that colors significantly affect the initial perception of a website. Bonnardel, Piolat, and Le Bigot (2011) analyzed the effect of the color scheme on users' perceptions and study the preference for website homepage colors. The impact of colors and color scheme on the user's perceptions was also investigated by Aladwani and Palvia (2002), Moshagen and Thielsch (2010), and Lee and Koubek (2010). Some studies suggest that website attributes should be examined as broader constructs. Hartmann, Sutcliffe, and De Angeli (2007) suggested that the user's overall impression can be a determinant of user satisfaction. Whether the overall impression is connected to content- or aesthetic-related attributes is a matter of debate (Thielsch, Blotenberg, & Jaron, 2013; Tuch, Roth, Hornbæk, Opwis, & Bargas-Avila, 2012). Therefore, website attributes including navigation, layout, content, visual appeal, color scheme, and overall impression are examined in this study.

The measurement instruments were based on valid and reliable scales. Each measurement was assessed on a five-point Likert (1932) scale. Such an approach is valid for measuring attitudes

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and is widely used in similar experiments (Zikmund, Carr, & Griffin, 1994). The measures of navigation effectiveness and layout clarity/hierarchy were adapted from Cebi (2013). The measure of content presentation was adapted from Geissler, Zinkhan, and Watson (2006) and Nadkarni and Gupta (2007). Color scheme perception and visual appeal measures were drawn from Cyr, Head, and Ivanov (2006) and Cyr, Head, and Larios (2010). The overall impression instrument utilized measures from Hartmann *et al.* (2007) and Thielsch *et al.* (2013).

Users were assigned three (randomly generated from a pool) tasks based on information retrieval. The tasks were formulated through a focus group with five senior students, who identified the most common information they retrieve from their schools' websites. The tasks were related to information retrieval about courses, lecturers, departments, and supporting services.

Tasks were specified as open-ended questions, and no instant feedback was given to the participants regarding whether they were successful in completing the task. Users were not told whether the requested information was available on the website, and it was left to them to judge if they succeeded in the task. Respondents proceeded to the next stage of the experiment, after they determined that the task had been completed. After completion of the three tasks, participants were asked to evaluate the same website attributes again.

The group of respondents included 30 participants aged between 19 and 23 (mean age 21.2 years), of whom 15 were men and 15 women. The respondents were university students (undergraduates in their second or third year of study; and had extensive and longstanding previous user experience with websites, but were not knowledgeable in the area of web design).

All the respondents were Czech native speakers, and belonged to the target group of the websites from the research sample. The respondents participated in the research voluntarily, without being offered financial or other incentives (such as extra credit, bonus points, or a class requirement). On the one hand, such a homogenous sample may be treated as a research

limitation; on the other, working with such a cohesive group was seen as an opportunity to analyze data and draw conclusions along gender lines without controlling for other respondent characteristics.

The number of respondents is sufficient for the type of experiment and allows valid usage of appropriate statistical methods (Good & Hardin, 2012). Prior to the experiment, respondents were instructed about the aim of the research, although they not told what the core performance attributes of the website were. The research sample included 44 websites for Czech business schools. Czech business tertiary education is just as popular with female as it is with male students, and all schools considered were co-ed. All accredited business schools or faculties in the Czech Republic (at the time of research) were included.

Since the results could have been influenced by the experience the users acquired during the experiment (Homburg, Koschate, & Hoyer, 2006), the respondents assessed the websites in a random order generated by a computer. Moreover, a pool of questions was used to randomly generate the task assignments for each respondent. The subsequent analysis did not reveal any significant differences in the task fulfillment success rate (95% confidence interval).

The experiment was performed in a classroom environment (all respondents at the same time). The classroom was equipped with standard office desktop computers, which were capable of any common office task (e.g., text editing, web browsing). All computers were identical. The websites were viewed in the common resolution at the time of the research (1024 × 768 px on a 17" flat screen monitor). Although the experiment was time-consuming (each respondent spent three to four hours assessing websites), all 1,320 (30 respondents × 44 websites in the research sample) evaluations were successfully obtained with no missing values.

## **Results**

First, the internal consistency estimate of test reliability was computed. Cronbach's alpha, which is one of the most commonly used reliability estimates (Hair, 2009), was used to measure

the internal consistency of the model. Internal consistency refers to the extent to which all the tested items measure the same concept/construct, and is, therefore, connected to the interrelatedness of the test items, such that when the items are correlated with each other, Cronbach's alpha increases. However, the alpha is also influenced by the number of items in the test (the alpha rises along with the number of test items); therefore, the alpha values must be considered carefully. For  $k = 5$  (number of items in the test: website content, layout, navigation, color scheme, and visual attractiveness), the Cronbach's alpha was 0.840 for the evaluation prior to the users' experience with the website and 0.858 for the evaluation following the users' experience with the website. Various authors suggest different acceptable alpha values, ranging from 0.70 (i.e. Nunnally, 1994) to 0.8–0.95 (i.e. Murphy & Davidshofer, 1998). Considering the number of items in the test, the internal consistency of the model can be accepted as high—the users understood the items as part of the same construct (related to website performance).

The research question regarding the nature of user satisfaction (asymmetry, nonlinearity) can be answered through a comparison of each user's evaluation before and after their experience with the website. The second evaluation was influenced by the performance of the website (whether the user completed the assigned task). Since the experimental design is based on a comparison of two satisfaction measurements (before and after the task), the Cochran–Mantel–Haenszel (M–H) test is appropriate (McDonald, 2009). The degree of association between stratified categorical data can be assessed through statistical tests of marginal homogeneity (Agresti, 2010). The input data is arranged in the form of a  $2 \times 2 \times k$  array and the null hypothesis assumes that there is no association between the proportions of the variables in any of the strata. The test is a more of a general alternative to the  $\chi^2$  test of independence. The M–H test statistic is increased with the difference between the two measures (Agresti, 2010).

The user evaluations for each analyzed attribute were arranged in a contingency table, where the rows represented the users' assessment prior to their experience and the columns represented their assessment after their experience with a website. The positive/negative evaluations (user completed/failed to complete the assigned tasks) were handled separately to investigate the potential asymmetry and nonlinearity in users' responses according to the positive and negative performance of a website. For each table, the M–H test statistic was computed. Since statistical hypothesis testing does not report on the magnitude of differences between the groups, the effect size should also be provided together with the p-values (Cohen, 1992). Cohen's kappa (Cohen, 1960) was chosen among various effect size coefficients to best reflect the nature of the data (Agresti, 2010). Landis and Koch (1977) characterize kappa values of less than 0 as indicating no agreement; 0–0.20 as slight; 0.21–0.40 as fair; 0.41–0.60 as moderate; 0.61–0.80 as substantial; and 0.81–1 as almost perfect agreement in the data. The hypothesis testing for marginal homogeneity in the case of positive user experience with a website (men and women were analyzed separately) is shown in Table 1.

**Table 1** Results for positive experience with the website

<<INSERT TABLE 1 HERE>>

For all the analyzed attributes, the male participants' evaluation changed after they experienced the website. A positive experience led to an improvement in the evaluation (see positive sign for M–H statistics in Table 1). However, only in the case of content and navigation was the difference statistically significant at a 95% confidence level. This was supported by the kappa values, indicating a slight agreement in the evaluations before and after the user undertook the tasks on the website. Cohen's kappa also revealed a slight agreement in the evaluation of the layout before and after the task.

The female participants' evaluations were a completely different story. For all analyzed attributes, the evaluation worsened after the experience with a website (see negative sign for

M–H statistics in Table 1), even though the women were able to fulfill the assigned task.

However, such a change was not statistically significant and the kappa values mostly indicated fair agreement in the evaluations before and after the experience with the website. In the case of content, the kappa indicated almost no agreement in evaluations before and after the experience with a website. The  $p$ -value in this case was on the edge of statistical significance (at a 95% confidence level). Such results indicate the reverse character of a given attribute—the websites may provide an overwhelming amount of content and confuse users when seeking information.

Subsequently, the analysis was conducted for evaluations representing the user’s negative experience with a website (men and women analyzed separately again). The results are shown in Table 2.

**Table 2** Results for negative experience with the website

<<INSERT TABLE 2 HERE>>

For all the analyzed attributes, the male participants’ evaluation changed after their experience with a website. Their evaluation of a website worsened with a negative experience (see negative sign for M–H statistics in Table 2). Moreover, the changes were more substantial (larger values of M–H statistics in Table 2 in comparison with Table 1) and statistically significant (at a 95% confidence level). This was confirmed by the kappa values (especially for content and navigation), indicating a slight agreement in evaluations before and after the user undertook the tasks on a website.

The female participants’ evaluations were a different story again. For all the analyzed attributes, the website evaluation worsened after the experience (see the negative sign for M–H statistics in Table 2). Some changes were more substantial for negative experiences (navigation, visual appeal, content, overall impression), whereas some results indicated otherwise (color scheme, layout). With the exception of content, the negative shift in

evaluations was not statistically significant (at a 95% confidence level). This was generally confirmed by the kappa values, indicating moderate agreement in the evaluation before and after the activity on a website. The only exception was navigation, where the kappa value shows only slight agreement, although this is not confirmed by the statistical inference. Again, there were differences between the male and female participants in their evaluation shifts before and after a negative experience with a particular website—women again mostly kept their evaluations based on their first impression formed prior to the activity on the website. The findings are summarized in Table 3 (*p*-values and Cohen's kappa from Tables 1 and 2).

**Table 3** Summary of findings

<<INSERT TABLE 3 HERE>>

Subsequent analysis focused on construction of the user satisfaction function according to the perceived performance and disconfirmation of expectations. The aim was to compare the relationship with the consumer satisfaction function suggested by Anderson and Sullivan (1993) based on expectation disconfirmation theory (Oliver, 2010). The function was constructed separately for the male and female participants. The function is shown in Figure 1; the dashed curve represents the male participants' response, whereas the dotted curve characterizes the female participants' response. In the top-right corner of the graph, the trajectory shows the cumulative share of male and female respondents who expressed their overall website satisfaction (vertical axis) while concurrently succeeding in the task completion (were able to find particular information on the website) above and beyond their initial expectations (horizontal axis). In the bottom-left corner, the curve shows the cumulative share for male and female participants who indicated their overall website dissatisfaction (vertical axis) while having trouble completing the task in spite of their initial expectations (horizontal axis). In comparison, the cumulative share of female participants in the upper-right quadrant was lower by 8% than the cumulative share of male participants (point 5 on the horizontal axis

*This is an Accepted Manuscript of an article published by Taylor & Francis Group in Services Marketing Quarterly on 08 Jun 2018, available online: <https://www.tandfonline.com/doi/full/10.1080/15332969.2018.1471954>.* in the graph). Similarly, the cumulative share of female participants in bottom-left quadrant

was also higher by 8% than the cumulative share of male participants (point -5 on the horizontal axis of the graph).

**Figure 1** Asymmetry and nonlinearity of user satisfaction (male and female participants considered separately)

<<INSERT FIGURE 1 HERE>>

As suggested by Anderson and Sullivan (1993) and Mittal *et al.* (1998), when a website outperforms the original expectations, the disconfirmation is positive, which results in increased user satisfaction. Conversely, when the website performance fails to meet expectations, the disconfirmation is negative, which results in increased user dissatisfaction. Losses loom larger than gains, which confirms the asymmetric effect on user satisfaction. Moreover, the trajectory appears concave for positive disconfirmation and convex for negative disconfirmation, which is typical for the nonlinear effect on user satisfaction.

For the male participants, the asymmetry could be observed in the extreme positions of the graph (points -5 and 5 on the horizontal axis)—the cumulative share of men who expressed satisfaction at the highest level of positive disconfirmation was 0.80, in comparison with the cumulative share of men who expressed dissatisfaction at the highest level of negative disconfirmation. Whereas for female participants, the ratio equaled only 0.60, which implies that women were more critical and less praising, and therefore even more asymmetric in their website assessment.

## **Discussion and Conclusion**

This study contributes to the current body of knowledge via an in-depth inquiry about the differences between how both gender groups perceive various website attributes. In general, women were more critical and less satisfied in their evaluations than men were for the same

levels of disconfirmation. Moreover, women kept their evaluations based on the first impression formed prior to the activity on the website. This was confirmed either if the perceived performance exceeded initial expectations (positive experience with a website; see negative signs for M–H statistics in Table 1), or when the initial expectations were above the perceived performance (negative experience with a website; see negative signs for M–H statistics in Table 2). Therefore, H1 is supported (female satisfaction with website performance is more sensitive to negative disconfirmation compared to male satisfaction with website performance). This further supports the conclusion about gender-based differences in complaining behavior (Kolodinsky, 1993), even though other studies indicate no difference between gender groups (Tronvoll, 2007). It could be that women have higher expectations in general (Hess, Ganesan, & Klein, 2003; Yelkur & Chakrabarty, 2006), together with lower perception scores when evaluating a product or a service (Kwok, Jusoh, & Khalifah, 2016).

Contrary to women, men expressed positive disconfirmation when their experience with a website outperformed their expectations (see positive values of M–H statistics for men’s satisfaction with positive experience with a website in Table 1). Hence, H2 is supported (male satisfaction with website performance is more sensitive to positive disconfirmation compared to female satisfaction with website performance). Both results for male and for female users are in line with previous studies suggesting a significant gender-related difference in consumer satisfaction with various levels of e-service performance (Deng et al., 2010; Rodgers & Harris, 2003).

Moreover, studies suggest that both gender groups might exhibit disconfirmation behaviors, such as complaints, for different reasons (Wolfe & Powell, 2009). The extent to which each gender complains may also be contingent on the subject being evaluated (Baggini, 2010). Complaining is not necessarily only a result of dissatisfaction, but is a social phenomenon (i.e., with regard to the person to whom is the customer complains) that can significantly affect

whether people will complain (Y. Zhang, Feick, & Mittal, 2014). However, this fact might be difficult to establish in online settings, where customers may express their dissatisfaction in novel way, such as distributing their concern widely (e.g., through social media) or simply switching to competing websites without really expressing their concerns.

The subsequent analysis focused on the asymmetric and nonlinear relationship between attribute-level product performance and overall customer satisfaction. The users' satisfaction function according to the perceived performance and disconfirmation of expectations suggested by Anderson and Sullivan (1993) based on expectation disconfirmation theory (Oliver, 2010) was examined for men and women separately (see Figure 1). Both curves show an asymmetric and nonlinear effect. Therefore, H3 is supported (changes in user satisfaction with a website are nonlinear and asymmetric compared to changes in perceived website performance).

However, there was a difference in the functions constructed separately for men's and women's evaluations. The shape of the curve and sizes of both effects differ. When the perceived performance lags behind the initial expectations, women express higher levels of dissatisfaction. A similar effect can be identified when the perceived performance outperforms initial expectations. Even though both genders gave rising satisfaction rankings as positive disconfirmation increased, women were less satisfied in general than men for the same levels of disconfirmation. The nature of website attributes varies greatly depending on the user's gender. Moreover, the same degree of attribute-level performance has a different impact on user satisfaction for men versus women, suggesting that extant satisfaction theory may be insufficient or even overtly simplistic. Such a conclusion resonates with previous studies (i.e. Chen, Chang, Hsu, & Yang, 2011; Tamimi, Sebastianelli, & Rajan, 2005) ascribing the most prominent role to gender among other segmentation characteristics (Moss, 2009).

The analysis uncovered a difference between men and women in their perceptions of various website attributes, as responses to the positive/negative performance of a website varied according to gender. The asymmetric and nonlinear nature of men's versus women's satisfaction with informational websites echoed the theory that has been anchored largely in research concerning conventional tangible products or more traditional offline services. The observed effect here was similar to the function of customer satisfaction suggested by authors such as Anderson and Sullivan (1993) and Mittal *et al.* (1998). However, the function of user satisfaction according to the perceived performance and disconfirmation of expectations differed for both gender groups, which, together with the empirical extension into online environments, represents the theoretical contribution of the research.

It also seems that it may be more challenging for companies to design informational websites that target female audiences than for males, if the desire is to stimulate their excitement. Different perceptions of the type of important satisfaction attributes may not only be contingent on gender; for instance, culture may also be a factor (Etgar & Fuchs, 2011). There still seems to be a significant knowledge gap.

### **Limitations and areas for future research**

Although the findings of this study offer many informative conclusions, they should be accepted with caution. Only one particular group of users has been examined here, and further limitations arise from the respondents considered and their characteristics (demographic, geographic, or cultural context and the respondents' backgrounds), which may have had further moderating or mediating impacts on the examined relationships. Determinants of customer satisfaction in online settings may also be influenced by the type of websites being examined (Cebi, 2013). This study focused on the informational websites, which may limit the generalizability of our findings. However, the commercial potential of information retrieval has been well recognized and may be related to business success (Wigand, 1997).

A vast amount of website performance metrics has been introduced since the beginning of the 1990s, and this study included only a limited set of characteristics. Treating the domain of gender as a binary variable has been also reported as a limiting factor in marketing research (Palan, 2001). Subsequent research may wish to address these limitations.

For researchers, the complex nature of customer satisfaction in online settings and the strength of gender-caused variations present significant opportunities for further research.

## References

- Agresti, A. (2010). *Analysis of ordinal categorical data*. Hoboken, NJ: Wiley & Sons Inc.
- Aladwani, A. M., & Palvia, P. C. (2002). Developing and validating an instrument for measuring user-perceived web quality. *Information & Management*, 39(6), 467-476.
- Anderson, E. W., & Mittal, V. (2000). Strengthening the satisfaction-profit chain. *Journal of Service research*, 3(2), 107-120.
- Anderson, E. W., & Sullivan, M. W. (1993). The antecedents and consequences of customer satisfaction for firms. *Marketing science*, 12(2), 125-143.
- Baggini, J. (2010). *Complaint: from minor moans to principled protests*. London, UK: Profile Books.
- Barnum, C. M. (2010). *Usability testing essentials: ready, set... test*. San Francisco, CA: Morgan Kaufmann.
- Bendall-Lyon, D., & Powers, T. L. (2002). The impact of gender differences on change in satisfaction over time. *Journal of Consumer Marketing*, 19(1), 12-23.
- Bonnardel, N., Piolat, A., & Le Bigot, L. (2011). The impact of colour on Website appeal and users' cognitive processes. *Displays*, 32(2), 69-80.
- Cadotte, E. R., & Turgeon, N. (1988). Dissatisfiers and satisfiers: suggestions from consumer complaints and compliments. *Journal of consumer satisfaction, Dissatisfaction and Complaining Behavior*, 1(1), 74-79.
- Cebi, S. (2013). Determining importance degrees of website design parameters based on interactions and types of websites. *Decision Support Systems*, 54(2), 1030-1043.
- Chan, T. K. H., Cheung, C. M. K., Shi, N., & Lee, M. K. O. (2015). Gender differences in satisfaction with Facebook users. *Industrial Management & Data Systems*, 115(1), 182-206.
- Chen, M.-C., Chang, K.-C., Hsu, C.-L., & Yang, I.-C. (2011). Understanding the relationship between service convenience and customer satisfaction in home delivery by Kano model. *Asia Pacific Journal of Marketing and Logistics*, 23(3), 386-410.

*This is an Accepted Manuscript of an article published by Taylor & Francis Group in Services Marketing Quarterly on 08 Jun 2018, available online: <https://www.tandfonline.com/doi/full/10.1080/15332969.2018.1471954>.*

Cheung, C. M. K., & Lee, M. K. O. (2005). *The asymmetric effect of website attribute performance on satisfaction: An empirical study*. Paper presented at the Hawaii International Conference on System Sciences Hawaii.

Cheung, C. M. K., & Lee, M. K. O. (2009). User satisfaction with an internet based portal: An asymmetric and nonlinear approach. *Journal of the American Society for Information Science and Technology*, 60(1), 111-122.

Chiou, W.-C., Lin, C.-C., & Perng, C. (2010). A strategic framework for website evaluation based on a review of the literature from 1995–2006. *Information & Management*, 47(5), 282-290.

Cohen, J. (1960). A coefficient of agreement for nominal scales. *Educational and psychological measurement*, 20(1), 37-46.

Cohen, J. (1992). A power primer. *Psychological bulletin*, 112(1), 155.

Colgate, M. R., & Danaher, P. J. (2000). Implementing a customer relationship strategy: the asymmetric impact of poor versus excellent execution. *Journal of the Academy of Marketing Science*, 28(3), 375.

Cooil, B., Keiningham, T. L., Aksoy, L., & Hsu, M. (2007). A longitudinal analysis of customer satisfaction and share of wallet: Investigating the moderating effect of customer characteristics. *Journal of Marketing*, 71(1), 67-83.

Cyr, D., Head, M., & Ivanov, A. (2006). Design aesthetics leading to m-loyalty in mobile commerce. *Information & Management*, 43(8), 950-963.

Cyr, D., Head, M., & Larios, H. (2010). Colour appeal in website design within and across cultures: A multi-method evaluation. *International Journal of Human-Computer Studies*, 68(1-2), 1-21.

Deng, Z., Lu, Y., Wei, K. K., & Zhang, J. (2010). Understanding customer satisfaction and loyalty: An empirical study of mobile instant messages in China. *International Journal of Information Management*, 30(4), 289-300.

Druckman, J. N., & Kam, C. D. (2009). Students as experimental participants: A defense of the 'narrow data base'. In D. P. G. J. N. Druckman, J. H. Kuklinski, & A. Lupia (Ed.), *Handbook of experimental political science*. New York, NY: Cambridge University Press.

Etgar, M., & Fuchs, G. (2011). Does ethnic/cultural dissimilarity affect perceptions of service quality? *Services Marketing Quarterly*, 32(2), 113-128.

Frank, B., Enkawa, T., & Schvaneveldt, S. J. (2014). How do the success factors driving repurchase intent differ between male and female customers? *Journal of the Academy of Marketing Science*, 42(2), 171-185.

Geissler, G. L., Zinkhan, G. M., & Watson, R. T. (2006). The influence of home page complexity on consumer attention, attitudes, and purchase intent. *Journal of Advertising*, 35(2), 69-80.

- This is an Accepted Manuscript of an article published by Taylor & Francis Group in Services Marketing Quarterly on 08 Jun 2018, available online: <https://www.tandfonline.com/doi/full/10.1080/15332969.2018.1471954>.*
- Good, P. I., & Hardin, J. W. (2012). *Common errors in statistics (and how to avoid them)*. New York, NY: Wiley & Sons Inc.
- Hair, J. F. (2009). *Multivariate data analysis* (7th ed.). Upper Saddle River: Prentice Hall.
- Hartmann, J., Sutcliffe, A., & De Angeli, A. (2007). *Investigating attractiveness in web user interfaces*. Paper presented at the SIGCHI conference on Human factors in computing systems.
- Harzing, A.-W. (2006). Response styles in cross-national survey research a 26-country study. *International Journal of Cross Cultural Management*, 6(2), 243-266.
- Hassenzahl, M., & Tractinsky, N. (2006). User experience-a research agenda. *Behaviour & Information Technology*, 25(2), 91-97.
- Helgesen, Ø., & Nettet, E. (2010). Gender, store satisfaction and antecedents: a case study of a grocery store. *Journal of Consumer Marketing*, 27(2), 114-126.
- Herzberg, F., Mausner, B., & Snyderman, B. B. (1993). *The motivation to work*. New York, NY: Wiley & Sons Inc.
- Hess, R. L., Ganesan, S., & Klein, N. M. (2003). Service failure and recovery: The impact of relationship factors on customer satisfaction. *Journal of the Academy of Marketing Science*, 31(2), 127-145.
- Heung, V. C., & Lam, T. (2003). Customer complaint behaviour towards hotel restaurant services. *International Journal of Contemporary Hospitality Management*, 15(5), 283-289.
- Homburg, C., Koschate, N., & Hoyer, W. D. (2006). The role of cognition and affect in the formation of customer satisfaction: a dynamic perspective. *Journal of Marketing*, 70(3), 21-31.
- Huang, J.-H., Huang, C.-T., & Wu, S. (1996). National character and response to unsatisfactory hotel service. *International Journal of Hospitality Management*, 15(3), 229-243.
- Jarvenpaa, S. L., & Todd, P. A. (1996). Consumer reactions to electronic shopping on the World Wide Web. *International Journal of Electronic Commerce*, 1(2), 59-88.
- Johnson, T., Kulesa, P., Cho, Y. I., & Shavitt, S. (2005). The relation between culture and response styles evidence from 19 countries. *Journal of Cross-cultural psychology*, 36(2), 264-277.
- Jones, D. L., McCleary, K. W., & Lepisto, L. R. (2002). Consumer complaint behavior manifestations for table service restaurants: Identifying sociodemographic characteristics, personality, and behavioral factors. *Journal of Hospitality & Tourism Research*, 26(2), 105-123.
- Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica: Journal of the Econometric Society*, 263-291.
- Kano, N., Seraku, N., Takahashi, F., & Tsuji, S. (1984). Attractive quality and must-be quality. *The Journal of the Japanese Society for Quality Control*, 14(2), 39-48.

- This is an Accepted Manuscript of an article published by Taylor & Francis Group in Services Marketing Quarterly on 08 Jun 2018, available online: <https://www.tandfonline.com/doi/full/10.1080/15332969.2018.1471954>.*
- Kolodinsky, J. (1993). Complaints, redress, and subsequent purchases of medical services by dissatisfied consumers. *Journal of Consumer Policy*, 16(2), 193-214.
- Kotler, P. (2014). *Marketing management* (14th ed.). New Jersey, NJ: Pearson Education.
- Kwok, S. Y., Jusoh, A., & Khalifah, Z. (2016). The influence of service quality on satisfaction: Does gender really matter? *Intangible Capital*, 12(2), 444-461.
- LaBarbera, P. A., & Mazursky, D. (1983). A longitudinal assessment of consumer satisfaction/dissatisfaction: the dynamic aspect of the cognitive process. *Journal of Marketing Research*, 393-404.
- Landis, J. R., & Koch, G. G. (1977). The measurement of observer agreement for categorical data. *Biometrics*, 33, 159-174.
- Laroche, M., Choi, K.-S., Lee, H., Kim, C., & Lee, S. (2005). The service quality dimensions and patient satisfaction relationships in South Korea: comparisons across gender, age and types of service. *Journal of Services Marketing*, 19(3), 140-149.
- Leavitt, M. O., & Shneiderman, B. (2006). *Research-Based Web Design & Usability Guidelines*. Washington, DC: US Government Printing Office. Online at: <http://www.usability.gov/pdfs/guidelines.html>
- Lee, S., & Koubek, R. J. (2010). The effects of usability and web design attributes on user preference for e-commerce web sites. *Computers in Industry*, 61(4), 329-341.
- Liefeld, J. P., Edgecombe, F. H., & Wolfe, L. (1975). Demographic characteristics of Canadian consumer complainers. *Journal of Consumer Affairs*, 9(1), 73-80.
- Lindgaard, G., Fernandes, G., Dudek, C., & Brown, J. (2006). Attention web designers: You have 50 milliseconds to make a good first impression! *Behaviour & Information Technology*, 25(2), 115-126.
- Mattila, A. S. (2000). The impact of culture and gender on customer evaluations of service encounters. *Journal of Hospitality & Tourism Research*, 24(2), 263-273.
- Matzler, K., Bailom, F., Hinterhuber, H. H., Renzl, B., & Pichler, J. (2004). The asymmetric relationship between attribute-level performance and overall customer satisfaction: a reconsideration of the importance-performance analysis. *Industrial Marketing Management*, 33(4), 271-277.
- McDonald, J. H. (2009). *Handbook of biological statistics* (Vol. 2). Baltimore, MD: Sparky House Publishing.
- McKinney, V., & Yoon, K. (2002). The measurement of web-customer satisfaction: An expectation and disconfirmation approach. *Information Systems Research*, 13(3), 296.
- Mikulić, J. (2007). *The Kano Model—A Review of its Application in Marketing Research from 1984 to 2006*. Paper presented at the Proceedings of the 1st International Conference marketing theory challenges in transitional societies, Maribor, Slovenia.

*This is an Accepted Manuscript of an article published by Taylor & Francis Group in Services Marketing Quarterly on 08 Jun 2018, available online: <https://www.tandfonline.com/doi/full/10.1080/15332969.2018.1471954>.*

Mittal, V., Ross Jr, W. T., & Baldasare, P. M. (1998). The asymmetric impact of negative and positive attribute-level performance on overall satisfaction and repurchase intentions. *The Journal of Marketing*, 62(1), 33-47.

Moshagen, M., & Thielsch, M. T. (2010). Facets of visual aesthetics. *International Journal of Human-Computer Studies*, 68(10), 689-709.

Moss, G. (2009). *Gender, design, and marketing: how gender drives our perception of design and marketing*. Farnham, UK: Gower Publishing, Ltd.

Moutinho, L., & Goode, M. (1995). Gender effects to the formation of overall product satisfaction: A multivariate approach. *Journal of International Consumer Marketing*, 8(1), 71-92.

Murphy, K. R., & Davidshofer, C. O. (1998). *Psychological Testing: Principles and Applications*. Englewood Cliffs, NJ: Prentice Hall.

Nadkarni, S., & Gupta, R. (2007). A task-based model of perceived website complexity. *Mis Quarterly*, 31(3), 501-524.

Nielsen, J. (2004). *Designing Web Usability: The Practice of Simplicity*. New Jersey, NJ: Pearson Education.

Nunnally, J. C. (1994). *Psychometric Theory* (3 ed.). New York, NY: McGraw-Hill Education.

Oliva, T. A., Oliver, R. L., & Bearden, W. O. (1995). The relationships among consumer satisfaction, involvement, and product performance: A catastrophe theory application. *Behavioral Science*, 40(2), 104-132.

Oliver, R. L. (1995). Attribute need fulfillment in product usage satisfaction. *Psychology & Marketing*, 12(1), 1-17.

Oliver, R. L. (2010). *Satisfaction: A behavioral perspective on the consumer* (2 ed.). Armonk, NY: M.E. Sharpe.

Oliver, R. L., & Linda, G. (1981). Effect of satisfaction and its antecedents on consumer preference and intention. *Advances in consumer research*, 8(1), 88-93.

Palan, K. M. (2001). Gender identity in consumer behavior research: A literature review and research agenda. *Academy of Marketing Science Review*, 6, 1-25.

Rai, A., Lang, S. S., & Welker, R. B. (2002). Assessing the validity of IS success models: An empirical test and theoretical analysis. *Information Systems Research*, 13(1), 50.

Randall, B., D. (1988). How service marketers can identify value-enhancing service elements. *Journal of Services Marketing*, 2(3), 35-41.

Rodgers, S., & Harris, M. A. (2003). Gender and e-commerce: an exploratory study. *Journal of advertising research*, 43(03), 322-329.

Sharma, P., Chen, I. S., & Luk, S. T. (2012). Gender and age as moderators in the service evaluation process. *Journal of Services Marketing*, 26(2), 102-114.

*This is an Accepted Manuscript of an article published by Taylor & Francis Group in Services Marketing Quarterly on 08 Jun 2018, available online: <https://www.tandfonline.com/doi/full/10.1080/15332969.2018.1471954>.*

Shi, N., Cheung, C. M. K., Lee, M. K. O., & Chen, H. (2009). Gender differences in the continuance of online social networks *Best Practices for the Knowledge Society. Knowledge, Learning, Development and Technology for All* (Vol. 49, pp. 216-225). Berlin: Springer.

Söderlund, M. (1998). Customer satisfaction and its consequences on customer behaviour revisited: The impact of different levels of satisfaction on word-of-mouth, feedback to the supplier and loyalty. *International journal of service industry management*, 9(2), 169-188.

Tamimi, N., Sebastianelli, R., & Rajan, M. (2005). What do online customers value? *Quality progress*, 38(7), 35.

Thielsch, M. T., Blotenberg, I., & Jaron, R. (2013). User evaluation of websites: From first impression to recommendation. *Interacting with Computers*, iwt033.

Tronvoll, B. (2007). Complainer characteristics when exit is closed. *International journal of service industry management*, 18(1), 25-51.

Tuch, A. N., Roth, S. P., Hornbæk, K., Opwis, K., & Bargas-Avila, J. A. (2012). Is beautiful really usable? Toward understanding the relation between usability, aesthetics, and affect in HCI. *Computers in Human Behavior*, 28(5), 1596-1607.

Vargo, S. L., Nagao, K., He, Y., & Morgan, F. W. (2007). Satisfiers, dissatisfiers, criticals, and neutrals: A review of their relative effects on customer (dis) satisfaction. *Academy of Marketing Science Review*, 11(2), 1-19.

Waite, K. (2006). Task scenario effects on bank web site expectations. *Internet Research*, 16(1), 7-22.

Walsh, G., Evanschitzky, H., & Wunderlich, M. (2008). Identification and analysis of moderator variables: investigating the customer satisfaction-loyalty link. *European Journal of Marketing*, 42(9/10), 977-1004.

Wolfe, J., & Powell, E. (2009). Gender and expressions of dissatisfaction: a study of complaining in mixed-gendered student work groups. *Women and Language*, 29(2).

Yelkur, R., & Chakrabarty, S. (2006). Gender differences in service quality expectations in the fast food industry. *Services Marketing Quarterly*, 27(4), 141-151.

Zahran, D. I., Al-Nuaim, H. A., Rutter, M. J., & Benyon, D. (2014). A comparative approach to web evaluation and website evaluation methods. *International Journal of Public Information Systems*, 10(1).

Zhang, P., & Von Dran, G. M. (2000). Satisfiers and dissatisfiers: a two-factor model for website design and evaluation. *Journal of the American Society for Information Science*, 51(14), 1253-1268.

Zhang, Y., Feick, L., & Mittal, V. (2014). How males and females differ in their likelihood of transmitting negative word of mouth. *Journal of Consumer Research*, 40(6), 1097-1108.

Zikmund, W. G., Carr, J. C., & Griffin, M. (1994). *Business research methods*. New York, NY: The Dryden Press.

*This is an Accepted Manuscript of an article published by Taylor & Francis Group in Services Marketing Quarterly on 08 Jun 2018, available online: <https://www.tandfonline.com/doi/full/10.1080/15332969.2018.1471954>.*