# THE MEDIATION EFFECT OF TRUSTING BELIEFS ON THE RELATIONSHIP BETWEEN EXPECTATION-CONFIRMATION AND SATISFACTION WITH THE USAGE OF ONLINE PRODUCT RECOMMENDATIONS

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**Abstract**

*Online Product Recommendations (OPRs) are increasingly available to online customers as a value-added self-service in evaluating and choosing a product. Research has highlighted several advantages that customers can gain from using OPRs. However, the realization of these advantages depends on whether and to what extent customers embrace and fully utilise them. The relatively low OPR usage rate indicates that customers have not yet developed trust in OPRs' performance. Past studies also have established that satisfaction is a valid measure of system performance and a consistent significant determinant of users' continuous system usage. Therefore, this study aimed to examine the mediation effect of trusting beliefs on the relationship between expectation-confirmation and satisfaction. The proposed research model is tested using data collected via an online survey from 626 existing users of OPRs. The empirical results revealed that social-psychological beliefs (perceived confirmation and trust) are significant contributors to customer satisfaction with OPRs. Additionally, trusting beliefs partially mediate the impact of perceived confirmation on customer satisfaction. Moreover, this study validates the extensions of the interpersonal trust construct to trust in OPRs and examines the nomological validity of trust in terms of competence, benevolence, and integrity. The findings provide a number of theoretical and practical implications.*

*Keywords: Online product recommendations, expectation-confirmation, trust, satisfaction,*

**Abstrak**

*Rekomendasi Produk Online (OPRs) semakin banyak tersedia bagi pelanggan online. Rekomendasi tersebut merupakan layanan mandiri yang memberikan nilai tambah dalam mengevaluasi dan memilih produk. Penelitian ini bertujuan untuk menguji pengaruh mediasi kepercayaan terhadap hubungan antara harapan-konfirmasi dan kepuasan pelanggan. Model penelitian diuji dengan menggunakan data yang dikumpulkan melalui survei online dari 626 pengguna OPR yang ada. Hasil empiris menunjukkan bahwa kepercayaan sosial-psikologis (perceived confirmation and trust) merupakan kontributor signifikan terhadap kepuasan pelanggan terhadap OPR. Selain itu, kepercayaan memediasi secara*

*parsial dampak dari konfirmasi yang dirasakan terhadap kepuasan pelanggan. Penelitian ini juga memberikan sejumlah implikasi teoritis dan praktis.*

*Kata kunci: Rekomendasi produk online, harapan-konfirmasi, kepercayaan, kepuasan,*

Better customer service and support are important factors to attract customers and keep them loyal to an online store. Recent advancements in Web-based technologies are providing many opportunities for e-retailers to better serve their customers. To help customers in their buying decisions, e-retailers (e.g., Amazon) are increasingly embedding their e-commerce sites with distinct product recommender systems to provide highly personalized product recommendations and assistance in searching, comparing, and evaluating products (Puzakova et al., 2013; Sheng et al., 2014). These online product recommendations (OPRs) encourage customers to purchase certain products, which can result in higher customer spending and improved retention rates (eMarketer, 2012). The recommender systems provide OPRs to online customers based on analysis of customers' profiles containing explicit product preferences or by tracking implicit preferences via past buying behavior (Benlian et al., 2012). In this study, OPRs refer to system-generated recommendations, which also incorporate consumer reviews. The consumer reviews are integrated into OPRs, perhaps with the purpose of providing more related information in order to improve buying decisions or to enhance the effectiveness of the recommender system (Baum & Spann, 2014; Benlian et al., 2012). For example, Baum and Spann (2014) reported that by providing positive opinions of consumers with

system-generated recommendations, e-retailers may increase the effectiveness of their recommender system, which subsequently influences customers' intention to follow OPRs. In particular, OPRs provide shopping assistance, help customers to reduce their cognitive efforts, enhance product inspection and improve decision quality (Xu, Benbasat, & Cenfetelli, 2014; Benlian et al., 2012).

The realization of the above-mentioned advantages depends on whether and to what extent customers embrace and fully utilise OPRs (Sheng et al., 2014). The current percentage of sales from OPR usage indicates that a large proportion of online customers are still not using OPRs for their online buying decisions. For example, various e-commerce specialists (Chu, 2013; Doman, 2011) and e-commerce industrial reports (Mckinsey, 2013) have highlighted that Amazon generates up to 30% of sales from OPRs, indicating a comparatively low OPR usage rate, due to the fact that a majority of customers have not developed trust in and are not satisfied with the performance of OPRs. Xiao and Benbasat (2011) reported that customers have doubts about OPRs in terms of their trustworthiness and performance. The general perception is that e-retailers provide recommendations due to their vested interest in increasing sales rather than their commitment to the customers' interests (Cheong and Morrison, 2008). Consequently, this perception hampers

customers' intentions to rely on OPRs for making buying decision (Benlian et al., 2012). Thus, regardless of the usefulness of OPRs, a critical issue is whether customers are satisfied with OPRs and will continue to use OPRs. This is an important and neglected issue in existing OPR literature (Sheng et al., 2014). The research (Benlian et al., 2012; Lin, 2014; Sheng et al., 2014; Xu et al., 2014) investigating OPR adoption is also fairly recent, and, consequently, less attention has been paid to examine customers' satisfaction with OPRs.

Furthermore, past studies (Griffiths et al., 2007; Lee, 2010; Sharabati, 2014) have established that satisfaction is a valid measure of system performance and usage commitment. Satisfaction plays a critical role in evaluating system success in voluntary contexts (Hou, 2012), as is the case in OPRs. An effective system that is considered by its users to be ineffective is, in fact, an unsatisfactory system. Therefore, increasing end-user satisfaction is a major concern of an e-retailer, especially if the usage is voluntary and is related to economic performance. Recent studies (e.g., Hsu, Chou, & Min, 2014; Oghuma, Libaque-Saenz, Wong, & Chang, 2015) also found that social-psychological beliefs (perceived confirmation and trust) are related to users' satisfaction. However, it is implied that the customers would most likely continue to use OPRs for future purchase if they are satisfied with the result of their expectation-confirmation and OPRs' trustworthiness. Otherwise, expectation-disconfirmation and a perceived lack of OPRs' trustworthiness leads to dissatisfaction and subsequently causes avoidance behaviour. Therefore, this study aimed at examining the impact of customers'

social-psychological beliefs (perceived confirmation and trust) on their satisfaction with OPRs. Additionally, the study examines the mediation effect of trusting beliefs on the relationship between perceived confirmation and satisfaction. Furthermore, we also empirically assess the nomological validity of trusting beliefs containing three dimensions: benevolence, competence, and integrity. A research model of social-psychological factors influencing customer satisfaction is developed. Central to this research model are the constructs of perceived confirmation and trusting belief, which are proposed to influence customers' satisfaction with OPRs.

Perceived confirmation and trusting beliefs are important due to the lack of direct methods for online customers to evaluate products before actual purchase (Benlian et al., 2012). Moreover, the absence of physical interaction between customers and retailers increases uncertainty and subsequently hinders their buying decision. Additionally, e-retailers can easily benefit by generating high consumer risk due to the unregulated activities and lower enforcement of legislations related to online shopping (Xiao & Benbasat, 2011). Particularly, trusting belief is well-recognized as an important determining factor of OPR success (Benlian et al., 2012; Qureshi et al., 2009; Fang et al., 2014). These studies implicitly showed that customers' trusting beliefs can effectively address the main issues by decreasing online environmental uncertainty, complexity, and risk. Conversely, expectation-disconfirmation and distrust leads customers to avoid or dicontinue using e-retailers' provided services. Arguably, the issues related to the online environment can also apply to OPRs, and incorporating expectation-

confirmation and trust variables in the model is expected to play a key role in predicting customers' satisfaction with OPRs. A lack of trust in OPRs and expectation-disconfirmation are likely to cause customers' dissatisfaction with OPRs.

The following section presents a review of literature on social-psychological beliefs and discusses the development of the proposed research model and related hypotheses. Subsequently, the research approach, data analysis, results discussion, and research implications, as well as study limitations and future research directions, are presented.

## LITERATURE REVIEW

### Social-Psychological Beliefs

Due to the nature of the underlying research phenomena, this study incorporated two factors: perceived confirmation and trusting belief, representing consumers' social-psychological beliefs. Social psychological beliefs are "the factors that lead an individual to behave in a given way in the presence of others, and look at the conditions under which certain behavior/actions and feelings occur" (Allport and Lindzey, 1959). Several past studies have used perceived confirmation (Lee, 2010; Thong, Hong, & Tam, 2006) and trusting beliefs (Benlian et al., 2012; Thong et al., 2006) in investigating adoption and post-adoption phenomena. A detailed discussion of the significance of incorporating these factors in this study is presented in the following sub-sections.

### Perceived Confirmation

Perceived confirmation is one of the major constructs from the IS continuance model; it is defined as

*"users' perception of the congruence between expectation of technology use and its actual performance"* (Bhattacherjee, 2001b). Bhattacherjee (2001b) developed new scales to measure the perceived expectation-confirmation of technology users. Users' perceived confirmation indicates that the individual obtained expected benefits from the technology, leading to a positive impact on their satisfaction. In contrast, a lack of expectation-confirmation in obtaining expected benefits leads to negative effect on individuals' satisfaction with the technology usage. This relationship is also explained in ECT-based studies (e.g., Hsu & Lin, 2015; Hossain & Quaddus, 2012), where satisfaction is separately influenced by expectation and confirmation after actual use of IS. These studies explain that users' expectations provide the baseline for the confirmation evaluated by users in order to determine their satisfaction level. Moreover, positive confirmation elevates individuals' satisfaction level, while negative confirmation deteriorates their satisfaction.

Many empirical studies have investigated the impact of perceived confirmation on various post-adoption expectations (e.g., usefulness, ease of use, enjoyment) in various technological contexts (e.g., e-learning, Lee, 2010; mobile applications, Hsu & Lin, 2015). In the context of OPRs, several past studies (e.g., Benlian et al., 2012; Komiak & Benbasat, 2006; Xiao & Benbasat, 2007) have highlighted the importance of considering and managing customers' expectations in the design of OPRs. These studies argued that customers might stop using OPRs due to losing faith in its usefulness when the OPRs do not fulfil their expectations. Komiak

and Benbasat (2004) highlighted that expectation-disconfirmation is a key factor contributing to distrust in OPRs. Despite the significance of expectation-confirmation in the design of OPRs, no empirical study has directly investigated the effect of perceived expectation-confirmation on satisfaction with OPRs. However, applying expectation-confirmation in the context of OPRs, it is expected that perceived confirmation concerning OPRs' performance will enhance consumers' satisfaction with OPRs, whereas the negative confirmation of their expectations will lead to dissatisfaction. The next section reviews literature on the significance of considering customers' trust in OPRs.

### Trust in Online Product Recommendations

Trust is an important factor of concern in the online shopping environment, because sellers' physical absence makes online transactions more vulnerable (Lowry et al., 2008). Trust is especially critical when customers use online recommendations (OPRs) or other forms of online decision aids (Dabholkar, 2006), because they may wonder whether OPRs are truly offered for their benefit or for the benefit of the e-retailers. Thus, trust in OPRs is one of the most prominent issues involved in their adoption (Benbasat & Wang, 2005). If customers do not trust in OPRs, then they are likely to reject their recommendations.

The majority of the past studies experimentally investigated the initial trust that customers develop when using OPRs for the first time (e.g., Benbasat & Wang, 2005; Benlian et al., 2012; Qin & Kong, 2015). For example, Benbasat and Wang (2005)

considered the social and relational aspects of initial trust in their decision to adopt OPRs after having experience with the OPR use. Hsiao et al. (2010) characterized two prospects of trusting belief – trust in OPRs and trust in a website – and focus on why people trust the information about product recommendations on social shopping networks of websites. Initial trusting belief may be updated or changed over time and with repeated interactions (Hoehle et al., 2012). To study the initial form of trust, a majority of the studies have applied behavioural theories, especially the technology acceptance model (TAM) (e.g., Benlian et al., 2012; Qin & Kong, 2015). For example, Benlian et al. (2012) extended the TAM by incorporating trusting belief and found that trust significantly mediated the impact of OPR use on customers' intention to reuse OPRs. Similarly, Qin and Kong (2015) incorporated trusting belief into the TAM and reported that perceived trustworthiness positively and significantly influence users' intention to seek shopping recommendations. Each of these studies defined trust according to their study contexts and disciplinary perspectives. Based on a cross-disciplinary literature review, Gefen, Karahanna, and Straub (2003) categorized three commonly adopted conceptualizations of trust: (i) "as a set of specific beliefs dealing primarily with the integrity, benevolence, and ability of another party", (ii) "as a general belief that another party can be trusted or the willingness of a party to be vulnerable to the actions of another", and (iii) "as an affect reflected in feelings of confidence and security in caring response of the other party". Past studies have also characterized trusting belief according to their study contexts. For

instance, Komiak and Benbasat (2006) conceptualized customers' trusting belief as a combination of cognitive trust and emotional trust, based on the assumption that trust decisions generally involve both reasoning and feeling. Yu et al. (2015) viewed trusting belief as a combination of competence, benevolence, integrity, and shared values.

In this study, trusting belief refers to customers' perceptions regarding the competence, benevolence, and integrity of the recommender system in providing OPRs (Komiak & Benbasat, 2006). In the context of OPRs, according to Yu et al. (2015) and Wang and Benbasat (2007), *"competence belief refers to the consumer's perception that the recommender systems have the skills and expertise to perform effectively in providing OPRs, benevolence belief refers to the consumer's belief that the recommender systems care about him or her and acts in his or her interest while generating OPRs, and integrity belief is the perception that the recommender system adheres to a set of principles (e.g., honesty) that are accepted by customers"*. Consequently, in this study, trusting belief is consistent with the concept of cognitive trust, referring to a customer's rational expectation that OPRs will have the necessary attributes to be relied upon.

Moreover, less attention has been paid to empirically examining the nomological validity of trusting beliefs in context of OPRs. That is, if customers form trust in OPRs, it should correlate with other customers' beliefs and should be able to predict their attitudes (e.g., satisfaction). Further empirical testing is needed concerning whether or not all three trusting beliefs – competence, benevolence, and integrity – hold true

for OPRs. To examine the nomological validity of trust in OPRs and reveal the relative importance of different trusting beliefs, we tested the theoretical model. The following section presents the theoretical model and related hypotheses developed.

### Theoretical Model and Hypotheses Development

In order to address the research objective, a research model is developed by incorporating perceived confirmation and satisfaction constructs from the expectation-confirmation model (ECM; Bhattacherjee, 2001b) and trusting belief construct from the study by Benlian et al. (2012) based on the theory of trust formation. In line with the ECM, it is argued that customers have positive or negative expectations about OPRs' trustworthiness prior to accepting them. While using OPRs, the customer's expectation of OPR trustworthiness is either confirmed or disconfirmed. A low expectation is easy to confirm and may be updated to a higher level as a result of positive experiences with OPRs. In contrast, a high expectation is difficult to confirm and may be adjusted to a lower level. This updated expectation may leads to customer satisfaction or dissatisfaction with the OPRs. As this study focuses on OPRs that assist customers in their buying tasks, it is assumed that the customers modify their social-psychological beliefs (expectation-confirmation and trust) towards OPRs use over time, which subsequently influences their satisfaction with the OPRs. The proposed research model and hypotheses related to the research objective are shown in Figure 1.

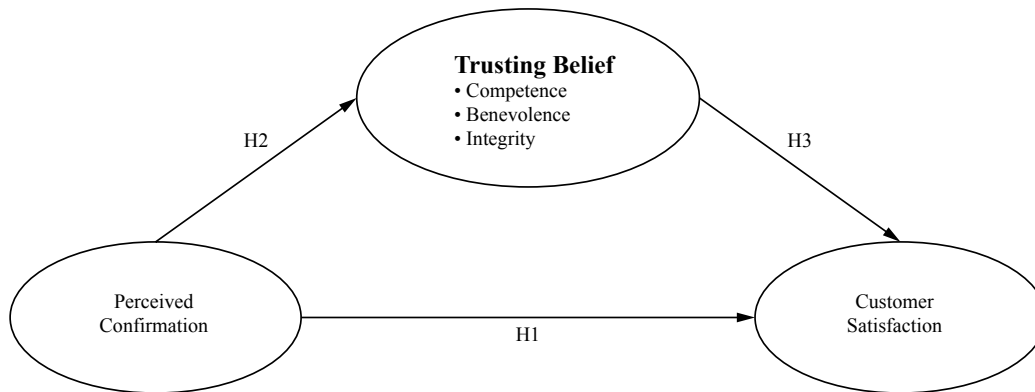The ECM posits that expectations provide baseline against perceived

Figure 1. Research model

confirmation is evaluated by the users of target technology in order to determine their level of satisfaction (Bhattacherjee, 2001b). Several past studies conducted in various contexts (e.g., e-learning, Lee, 2010; mobile applications, Hsu & Lin, 2015) validated the proposition that perceived confirmation is positively related to individuals' satisfaction.

Perceived confirmation indicates the recognition of the expected benefits of technology usage, and satisfaction refers to a higher affective state reflected in a satisfied, indifferent, or dissatisfied feeling resulting from a cognitive appraisal of perceived confirmation. In the context of OPRs, customers' expectation-confirmation is attained when the OPR performs as much as expected, positively confirmed when the OPR performs better than expected, and negatively confirmed when the OPR performs worse than expected. This implies that the higher (lower) confirmation causes higher (lower) satisfaction. Since several past studies based on ECM have already tested this relationship, without arguing further, the following hypothesis is derived in our study context:

**H1**: Customers' perceived confirmation positively influences their satisfaction with OPRs.

Cheung et al. (2007) conducted an empirical study on how people evaluate online recommendations and found that customers' confirmation of prior beliefs significantly influences the perceived credibility of online recommendations. They further reported that customers can detect their level of confirmation between the received information and prior belief through various direct or indirect experiences. When they detect that the information is consistent with their prior knowledge, they will have more confidence to believe the received information and use that information for subsequent purchase decisions (Cheung et al., 2007). However, if the OPR confirms the customers' existing belief, then they will be more likely to trust the OPR. Conversely, if the OPR disconfirms the prior belief, the customer would probably refuse to accept the recommendation and would discount its validity. Similar reasoning would be applied when investigating the impact of customers' perceived confirmation on trust in OPRs. It is expected that the extent of perceived confirmation would be positively related to customers' trusting

beliefs in terms of the competence, benevolence, and integrity of OPRs. That is, as customers gain confirmation experience with OPRs, the customers' trust will be updated and become more concrete in determining their satisfaction with OPRs. Customers' positive confirmation with OPR usage will lead them to believe that OPRs will act cooperatively to fulfil their expectations without exploiting their vulnerabilities. Thus, we propose the following hypothesis:

**H2**: Customers' perceived confirmation is positively related to their trust in OPRs.

Trust is an important predictor of satisfied and loyal customers. Kim et al. (2009) and Sharabati (2014) found that trust significantly influences users' satisfaction. The impact of trusting belief on satisfaction can further be supported with Festinger's cognitive dissonance theory (Festinger, 1962), which elaborates the relationship between customer trust and satisfaction while striving for harmony in their perception, values, and beliefs; Festinger reported that satisfaction is likely to be higher when trust is higher and lower when trust is lower. More generally, in different contexts (e.g., online banking, virtual investment), past studies (e.g., Hoehle et al., 2012) have also demonstrated that customers trusting belief has an impact on satisfaction. Customers' trust is developed and adjusted over a period of time by positive or negative experiences with OPR usage (Kim et al., 2009). Therefore, it is expected that greater (lower) customer trust in OPRs will be associated with greater (lower) customer satisfaction with OPRs.

**H3**: Customers' trusting belief positively influences their satisfaction with OPRs.

The direct impact of perceived confirmation on users' satisfaction with technology has been validated in various contexts (e.g., e-learning, Lee, 2010; mobile applications, Hsu & Lin, 2015). The mediation effect of trust has also been proven in different contexts by several scholars. For example, Kassim, Jailani, Hairuddin, and Zamzuri (2012) found that trust has a significant mediating effect between system acceptance variables and satisfaction. Similarly, Sharabati (2014) conducted a study on e-procurement systems and found that trust significantly mediated the impact of system qualities on satisfaction. After performing an in-depth literature review in the context of OPRs, we found no previous study that tested the mediation effect of trust between perceived confirmation and customer satisfaction with the OPRs. Therefore, we propose the following hypothesis to examine the mediating the effect of trusting belief:

**H4**: Trusting beliefs has a mediating effect on the relationship between perceived confirmation and customer satisfaction with OPRs.

**RESEARCH METHODOLOGY**

*Construct Measurements*

The measurements of the research variables are shown in Appendix A. All measurements of theoretical constructs were adapted from prior studies (Benlian et al., 2012; Bhattacherjee, 2001b) and slightly modified to suit the study context (i.e., OPRs). Most of the items used a 5- point Likert scale anchored by "strongly disagree" and "strongly agree", except for the satisfaction items, which were 5-point semantic differential scales. One

screening questions was also included to determine whether the respondents have used OPRs for buying at least one product over the last six months. Only responses from existing users of OPRs were included in the data analysis. This study collected data from Amazon customers who had used OPRs to make purchase decisions over the last six months. In order to improve the validity and reliability of the survey instrument, the study constructs and related measurements were validated through several actions via expert panel (2 academicians, 1 e-retailer, and 2 online customers), pre-testing (9 academicians), and pilot testing (50 Amazon customers). Since pilot testing showed that the constructs have good internal consistency (all alpha values were greater than 0.80), no further modifications were made to the survey questionnaire.

### Data Collection

This study focused on real users of OPRs, because most past studies have neglected the "real-world" user environment in favour of controlled and overly structured laboratory experiments, thus making them unable to explore how decision makers actually obtain information and use it in the process of making buying decisions (Zha et al. 2013). However, Amazon customers were considered the target population for two major reasons: first, a verified list of Amazon customers is available on the Amazon website; second, they have exposure to online product recommendations (OPRs) while making buying decisions. Moreover, Amazon is chosen as the context of this study, because Amazon is recognized as one of the leading e-commerce retailers and is a positive example for other online shopping stores in terms of the way it

supports the provision of OPRs (Archak et al., 2011; Benlian et al., 2012). Since Amazon customers are geographically dispersed, an online survey was a more suitable and effective way to reach the target audience (Wright, 2005). After visiting the profiles of 140,000 Amazon customers, 3500 email addresses were collected and used for sending online survey invitations via the surveymonkey platform. The online survey was conducted from mid-May to the end of September 2015. A total of 751 responses were received, of which 626 responses were useable while the remaining 125 responses were deleted due to significant missing data. Of the 626 respondents, 329 (52.6%) respondents were male and the rest were female. Almost all respondents (92%) were older than 26 years of age; 171 (27.3%) were older than 55, followed by the 46-55 group with 141 respondents (22.5%), while 5 (0.8%) respondents did not report their age group. Regarding geographical location, the respondents belong to 15 different countries, but a majority of the respondents were from the USA (45%) and UK (14.1%), followed by Germany (7.2%), France (6.1%), Italy (5.6%), and Canada (4.8%). Moreover, a five-point Likert scale was used to measure respondents' familiarity with Amazon and OPR; the mean value shows that respondents have a high familiarity with Amazon (mean=4.81, SD=0.593) and OPR (mean=4.62, SD=0.838) and that they regularly visit Amazon (mean=4.32, SD=0.81). The demographic summary of survey respondents is presented in Appendix B.

### Non-Response Bias Analysis

Non-response bias is one of the major challenges for studies using cross-sectional surveys as a data collection

Table 1. Analysis of Non-response Bias

| Variables | | N | Mean | Std. Deviation | t-Statistics | Sig. (2-tailed) |
|---|---|---|---|---|---|---|
| Perceived Confirmation | Early | 100 | 3.3370 | 0.92126 | 0.023 | 0.982 |
| | Late | 100 | 3.3400 | 0.91008 | | |
| Competence Trust | Early | 100 | 4.0133 | 0.83943 | 1.172 | 0.244 |
| | Late | 100 | 3.8610 | 0.83408 | | |
| Benevolence Trust | Early | 100 | 3.3267 | 1.00502 | -1.146 | 0.255 |
| | Late | 100 | 3.4933 | 0.97957 | | |
| Integrity Trust | Early | 100 | 3.1358 | 1.15013 | -1.339 | 0.184 |
| | Late | 100 | 3.3500 | 1.02309 | | |
| Satisfaction | Early | 100 | 3.5762 | 0.95471 | -0.950 | 0.345 |
| | Late | 100 | 3.4440 | 1.07788 | | |

approach (Malhotra, 2010). Prior studies (e.g., Atif, Richards, & Bilgin, 2012) suggested assessing non-response bias regardless of how high or low a response rate is achieved. In this study, the non-response bias analysis was conducted by contrasting the responses of early (first 100) and late (last 100) respondents. To check for non-response bias, a comparison of means on all study constructs was carried out using paired t-tests. The results revealed that the significance value for all study constructs is above 0.05. Thus, it is concluded that there are no statistically significant differences in the means for these two groups and that, therefore, those respondents who did not respond the survey will probably have the same perceptions of the constructs as those who did respond. Table 1 presents the results for non-response bias.

**DATA ANALYSIS AND RESULTS**

For the data analysis, we followed the two-step procedure recommended by Anderson and Gerbing (1988) and subsequently followed by several past studies (e.g., Handfield, et al., 2015; Selnes, 2013). First, we examined the measurement model to measure reliability, convergent validity, and discriminant validity. Second, we examined the structural model via structural equation modeling (SEM) using SmartPLS (version 2 M3). As compared to covariance-based SEM (CB-SEM), PLS is more robust to multicollinearity and distributional variance in item properties, flexibly supports a variety of research variable types, and is suitable when the data is non-normal (Hair et al., 2011). Additionally, PLS-SEM is more suitable for explaining complex relationships, as it eliminates two key issues: inadmissible solutions and factor indeterminacy (Hair, Sarstedt, Hopkins, & Kuppelwieser, 2014). Moreover, PLS-SEM simultaneously analyses how well the measures relate to each construct and whether the proposed hypotheses are supported.

*Assessment of Measurement Model*

As shown in Table 2, Cronbach's alpha values and composite reliability estimates are 0.947 or higher, indicating that each construct exhibited strong

Table 2. Descriptive Statistics, Reliability, and Convergent Validity

| Variables | N | Mean | SD | Factor Loadings | Cronbach' Value | Composite Reliability | AVE |
|---|---|---|---|---|---|---|---|
| **Customer Satisfaction** | | | | | 0.948 | 0.963 | 0.866 |
| SAT1 | 626 | 3.767 | 1.018 | 0.907 | | | |
| SAT2 | 626 | 3.619 | 1.055 | 0.949 | | | |
| SAT3 | 626 | 3.528 | 1.056 | 0.936 | | | |
| SAT4 | 626 | 3.473 | 1.036 | 0.929 | | | |
| **Competence Trust** | | | | | 0.919 | 0.948 | 0.860 |
| CT1 | 626 | 4.016 | .796 | 0.932 | | | |
| CT2 | 626 | 3.883 | .900 | 0.927 | | | |
| CT3 | 626 | 3.983 | .842 | 0.923 | | | |
| **Benevolence Trust** | | | | | 0.917 | 0.947 | 0.858 |
| BT1 | 626 | 3.561 | .985 | 0.912 | | | |
| BT2 | 626 | 3.718 | .975 | 0.943 | | | |
| BT3 | 626 | 3.681 | .985 | 0.924 | | | |
| **Integrity Trust** | | | | | 0.954 | 0.967 | 0.878 |
| IT1 | 626 | 3.521 | 0.970 | 0.949 | | | |
| IT2 | 626 | 3.194 | 1.046 | 0.888 | | | |
| IT3 | 626 | 3.502 | 0.993 | 0.964 | | | |
| IT4 | 626 | 3.479 | 1.015 | 0.947 | | | |
| **Perceived Confirmation** | | | | | 0.962 | 0.976 | 0.930 |
| PC1 | 626 | 3.476 | 0.909 | 0.983 | | | |
| PC2 | 626 | 3.400 | 0.900 | 0.926 | | | |
| PC3 | 626 | 3.476 | 0.909 | 0.983 | | | |

internal reliability (Hair et al., 2006). Convergent validity can be assessed by the values of average variance extracted (AVE), which refers to the degree to which the construct identifies the variance of its indicators. The rule of thumb for convergent validity is that the AVE value must exceed 0.50 (Hair et al., 2014). Moreover, confirmatory factor analysis (CFA) is another indicator of convergent validity. This study ran CFA using PLS-SEM in order to examine the inter-factor and cross-factor loadings. Convergent validity is realized if the items of each construct loading exceed 0.70 on their construct than the other constructs (Hair et al., 2014). As shown in Table 2, loadings for all items of the reflective construct are reported to have values greater than 0.880, and AVE values for all constructs are above the cut point of 0.50. The AVE values are 0.860 or greater, indicating that at least 86% of the variances observed in the items are accounted for by their hypothesized variables. Consequently, convergent validity is achieved among all constructs.

Table 3. Discriminant Validity

| | SAT | CT | BT | IT | PC |
|---|---|---|---|---|---|
| Satisfaction (SAT) | **0.866** | | | | |
| Competence Trust (CT) | 0.247 | **0.860** | | | |
| Benevolence Trust (BT) | 0.388 | 0.507 | **0.858** | | |
| Integrity Trust (IT) | 0.388 | 0.343 | 0.598 | **0.878** | |
| Perceived Confirmation (PC) | 0.381 | 0.298 | 0.415 | 0.425 | **0.930** |

Note: Diagonal values are AVEs, and remaining values are squared correlations.

Discriminant validity refers to "the degree to which construct is distinct from other constructs" (Hair et al., 2010). There are two ways to assess discriminant validity (Hair et al., 2010). First, the factor loadings of each item must be greater than the cross loadings of items of other constructs. Second, the level of correlation between the construct and other constructs. For the first type of discriminant analysis, CFA analysis was performed, and the results showed that the scale items of the constructs loaded more strongly on their respective constructs than on other constructs. For the second type of discriminant validity analysis, AVE values for each construct are compared with squared correlation values between the construct and other constructs. Table 3 shows the correlation matrix of constructs and AVE. The results indicate that all AVE values are greater than the squared inter-construct correlation value. Consequently, the results confirmed the achievement of discriminant validity.

### Assessment of Structural Model

In order to assess the structural model, tests of significance were performed using the bootstrap re-sampling procedure (Hair et al., 2011; Hair et al., 2013). Figure 2 provides the PLS-SEM results of the structural model, including path coefficients, explained variances, and significant levels. We also examined the mediating effect of trust; results are reported in Table 4. The results showed that all four hypotheses were supported by the data. Overall, the model explains 48.2% of the variance in the dependent variable of customer satisfaction with OPRs. The model also explains 47.9% of the variance in customer's trusting belief in OPRs. In addition, perceived confirmation has a statistically significant stronger impact on customers' trusting belief ($\beta = 0.695$, p<.001) as compared to satisfaction ($\beta = 0.309$, p<.001). Additionally, customers' trusting belief exhibited a significant impact on customer satisfaction ($\beta = 0.444$, p<.001). Furthermore, the relative importance of the three dimensions of trusting beliefs in predicting satisfaction is also revealed by the loadings of the three trusting beliefs on the second-order trust construct, which are all significant at the level of 0.001. Customers' trusting beliefs in the benevolence (0.92) and integrity (0.91) of OPRs have similar but higher importance compared to their beliefs in the competence (0.82) of the OPRs.

In addition, the significant results regarding the impact of perceived confirmation on trusting belief in OPRs, as well as the impact of trusting
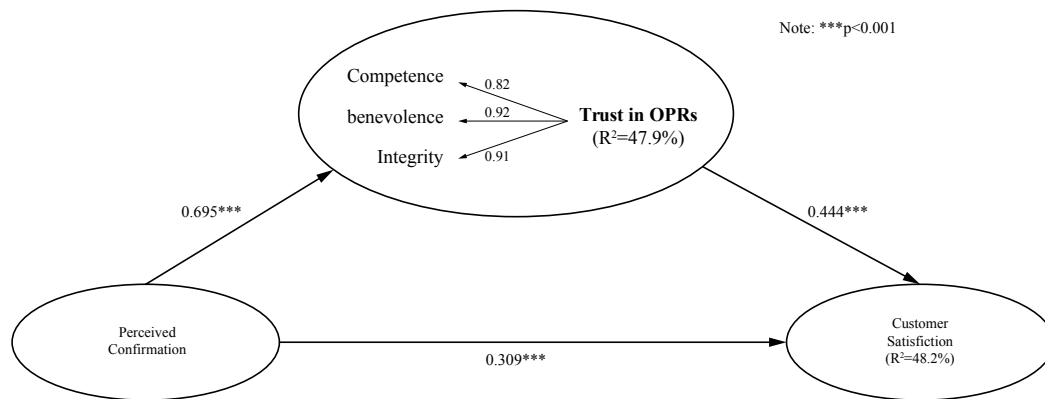
Figure 2. PLS Results of the Research Model

Table 4. Results of Trust Mediation Analysis

| Causal Paths | PC → TRUST → SAT | | |
|---|---|---|---|
| | Effect value | t-value | p-value |
| *Without Mediator* | | | |
| Direct effect (PC → SAT) | 0.617 | 19.018 | 0.000 |
| *With Mediator* | | | |
| Direct effect (PC → SAT) | 0.309 | 4.539 | 0.000 |
| Indirect effect (PC → TRUST → SAT) | 0.308 | 6.198 | 0.000 |
| Total effect (PC → TRUST → SAT) | 0.617 | 18.827 | 0.000 |
| Variance Accounted For (VAF) | 48.3% | | |
| | *Partial Mediation* | | |

Note: PC: Perceived Confirmation; TRUST: Trusting Belief; SAT: Satisfaction.

belief on satisfaction, confirm the nomological validity of trusting belief in online product recommendation (OPRs). As shown in Figure 2, PLS-SEM results revealed that perceived confirmation and trusting belief have a direct influence on customer satisfaction, as well as an indirect effect of perceived confirmation on satisfaction via trust. In order to explore the mediating impact, we also examined whether trusting belief has a mediating effect on the relationship between perceived confirmation and satisfaction with OPRs. To test the trust-mediating effect, we followed three steps recommended by Hair et al. (2014). Step one is to test the significance of the direct effect without including the mediator (if this result is not significant, then there is no mediating effect). Step two is to test the significance of the indirect effect while including the mediator (if it is not significant, then there is no mediating effect). Step three is to test the strength of the mediation by calculating variance accounted for (VAF) (VAF > 80% indicates full mediation; 20% ≤ VAF ≤ 80% indicates partial mediation; VAF < 20% indicates no mediation). In order to analyse the trust mediation, PLS-SEM was performed as recommended by Hair et al. (2014). The significance of the indirect effect was also calculated by using the Sobel test

(Sobel, 1982). Table 4 summarizes the effect values in addition to t-values and p-values for the two paths measuring the trust mediating effect. Thus, the result confirmed the mediating impact of trust in the theoretical model. The model is superior when trusting belief is incorporated as a mediator between perceived confirmation and satisfaction. It further validated the key role of trust in predicting customer satisfaction with the OPRs.

## RESEARCH IMPLICATIONS

### Implications for Theory

The findings of this study provide several implications for theory and practice. In the context of OPRs, no prior study examined the role of customers' social-psychological beliefs (perceived confirmation and trusting beliefs) in predicting customers' satisfaction with OPRs. This is the first study to successfully test these relationships, and it is likely to ensure stable further theory development. The empirical results showed that the research model has good explanatory power, implying that perceived confirmation and trust play an important role in determining customer satisfaction with the OPRs. It indicates that customers would most likely to be satisfied with OPR usage if the OPRs are trustworthy and fulfil customers' expectation of better product evaluations. Moreover, it is also important to take into account the nature and characteristics of the target technology or service while investigating it. In this study, based on the nature of the OPRs, we examined the impact of trusting beliefs, which emphasizes the OPRs' truthfulness and genuineness in facilitating customers' buying decision. Therefore, future studies can be conducted to clarify the antecedents of trusting beliefs in the context of customers' continuous usage of OPRs. Additionally, it would also be interesting to examine the evolution of trusting beliefs from initial trust to continuous trust in OPRs. For this investigation, a longitudinal study is recommended.

Moreover, findings from this study and the prior studies mentioned above imply that the nature of trust in technological artefacts should not be fundamentally different from interpersonal trust. Therefore, trust formation theories in the interpersonal domain may generally apply to the examination of trust in the technological context. Nevertheless, there may be unique factors for trust in technology. However, future research is required to examine whether the conceptualization of trust in technology should be extended to incorporate other relevant factors.

### Implications for Practice

In terms of this study's contribution to practice, the saliency of perceived confirmation, trust, and satisfaction presents e-retailers with potential fruitful areas to affect customer satisfaction with OPRs. A major objective for e-retailers should be to formulate strategies to manage customers' expectations by increasing OPR trustworthiness, which subsequently leads to higher satisfaction. As a result, e-retailers will be able to retain existing customers and hopefully increase their intention to rely on OPRs for making buying decision. Meanwhile, these satisfied customers can provide an effective channel to bring in new customers through word-of-mouth promotions about OPR trustworthiness.

The second implication for e-retailers is that OPRs are subject to constant change due to changes in customers' preferences or past buying behaviour. Consequently, it can influence customers' perceived confirmation, trusting beliefs, and satisfaction based on updated experience with the OPRs. In addition, these variables, particularly trust, can be influenced by changes in the external environment, such as a newspaper article or industry report discussing how e-retailers deliberately employ various deceptive tactics by manipulating OPRs to promote an approach behaviour. In such a case, the customer's awareness of the retailer's intention of deception makes them less likely rely on the OPRs, despite having a greater perception of product value.

A third implication for e-retailers is to understand the causal nature of the relationship among perceived confirmation, trust, and satisfaction. For instance, a trusted OPR will pay higher dividends for customer satisfaction than may be just focusing to enhance its usefulness. Our findings imply that specific trust artefacts such as truthful and unbiased OPRs, guarantee of true product information, and correct product delivery from third parties are valued by customers. However, e-retailers should clearly demonstrate the measures they are taking to manage customers' expectations and to preserve OPRs' trustworthiness among customers.

Finally, since the majority of respondents were from Western countries, the implications of our findings can be fruitful to e-retailers in Asia who intend to penetrate the global market and, in particular, Amazon customers.

## STUDY LIMITATIONS AND FUTURE RESEARCH

A few study limitations, along with future research suggestions, should be noted. First, the current study used a cross-sectional design rather than a longitudinal design. If the purpose is to examine whether pre-adoption expectations actually change after confirmation of experiences, then a longitudinal design is recommended to give a clearer picture of how the users and the relationships among variables change over time. As our objective was to examine the influence of social-psychological beliefs on satisfaction, a cross-sectional design was appropriate for this study. Second, concerns about common method bias (CMB) could arise due to the use of a cross-sectional survey; however, the results of Harman's one-factor test and correlation matrix indicated that CMB was not a serious concern in this study. Future studies may apply other methods to address CMB, as suggested by Podsakoff et al. (2012). Third, the majority of the respondents were from developed countries, which have a unique cultural environment that differs from that of developing countries. Thus, the generalizability of our findings from Western culture to Asian culture and other e-commerce environments (other than Amazon) needs to be confirmed with future studies. Fourth, although a MANOVA test revealed that individuals' characteristics were not the cause of the differences in customers' beliefs, future studies may examine the moderating impacts of age, gender, culture, and familiarity on the relationship between customers' beliefs and satisfaction. Fifth, this study examined the impact of social-psychological beliefs on satisfaction. Future studies can be

conducted to examine the impact of social-psychological beliefs and satisfaction on customers' OPRs continuance intention. Sixth, past studies (e.g., Benlian et al., 2012) have also shown that product type has a significant moderating impact on consumers' beliefs and attitude towards OPR use. Future studies may explore the moderating impact of product type (e.g., search and experience) on the relationships between these variables.

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