

# **Predicting usefulness of electronic word-of-mouth in the information-overload age: A mixed-method study**

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by

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Date: September 8, 2017

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This dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Business and Socioeconomic Sciences in the Department of Tourism and Service Management in the Post-Graduate School of MODUL University Vienna.

Year 2017

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Date



## OVERVIEW OF THIS DISSERTATION

The emergence of electronic word-of-mouth (eWOM) in general and online reviews in particular undoubtedly attenuates the negative effect derived from information asymmetry since travelers now have more information for assessing hotel quality and making choices. However, the usefulness of online reviews has been gradually becoming a matter of concern since the abundance of online reviews increase cognitive costs for travelers to process and judge review usefulness. Considering the pivotal role of readers' perceived usefulness of online reviews on readers' subsequent behavioral responses as well as the ultimate success of businesses' viral marketing strategy, this dissertation (with three separate studies) is designed to contribute the growing stream of research on online reviews by investigating "what makes a useful online hotel review?"

To synthesize the knowledge regarding online reviews (and eWOM in general) in the tourism and hospitality context as well as to redress the fragmentation problem resulted from the richer volume of eWOM-related literature, Study 1 firstly presents a systematic review of 195 eWOM-related full-length journal articles published between 2001 and 2015. Based on a nine-quadrant framework adapted from Nyilasy (2005), the findings of Study 1 reveal that diversified eWOM-related topics have been investigated over the past 15 years but scholarly attention is unevenly distributed. Besides unveiling the current state of research on eWOM in tourism and hospitality (i.e., what we know), Study 1 also identifies several potential research voids among extant studies (i.e., what we don't know). The agenda for future research developed in Study 1 is expected to provide clues for subsequent researchers to contribute more knowledge to the stream of eWOM research.

After revisiting the knowledge pertinent to eWOM and online reviews in the tourism and hospitality context, Study 2 is designed to redress two limitations among studies on review usefulness: (1) the paucity of research examining determinants affecting perceived usefulness of online hotel reviews; and (2) the absence of research exploring the impact of style-related characteristics on receivers' assessment of review usefulness. Since online reviews are one type of social communications working within a framework of "who says what in which form with what effect on the audience", the primary objective of Study 2 is to examine the main and interactive impact of review content, review style and review source on receivers' perceived review usefulness. Harnessing negative binomial regression to analyze over 1,900 online reviews on hotels in five European cities which were published on TripAdvisor.com, the findings show that review depth, presence of photo, review readability and reviewer reputation have a positive impact on review usefulness. The impact of review breadth and reviewer expertise on review usefulness are negative, while readers' perceived review usefulness is not influenced by photo volume, document-level and sentence-level linguistic styles. Being one of the first studies attempting to combine

content-, style- and source-related characteristics into one model for predicting receivers' perceived usefulness of online hotel reviews, this study does not only contribute new knowledge to the growing stream of research on online reviews but also provide hoteliers with practical clues about online review management.

To extend the results from Study 2 as well as to redress another research void of existing studies (i.e., over-reliance on panel data analysis while limited primary research was conducted), Study 3 examines the relative influence of content-, style-, and source-related characteristics on readers' perceived usefulness and adoption intention of online hotel reviews based on a between-subject experiment. Drawing on the findings from a 2 x 2 x 2 x 2 between-subject experiment with 1,140 online hotel review readers, readers are found to rate perceived review content quality at a higher level when reviews are written using functional language. On the contrary, reviews written using emotional language are perceived as having a lower level of content quality. Review depth is found to have a positive impact on review content quality but no main effect is evident for review breadth. Regarding the impact of source-related characteristics on reviewer credibility, reviewer reputation is found to have a positive impact on reviewer credibility. However, the main effect of reviewer expertise as well as the moderating effect of perceptual homophily are not empirically proven. The results from the structural equation modelling show that both review content quality and reviewer credibility have a positive impact on review usefulness, and this may in turn positively affect readers' review adoption intention. This is in line with the theorems of Sussman and Siegal's (2003) theory of information adoption. Being one of the first studies using the experimental design approach to examine the impact of content-, style- and source-related characteristics on readers' perceived review usefulness and adoption predisposition, this study does not only enrich the theoretical understanding about the antecedents and consequences of review usefulness but also provide practitioners in the field with clues for improving their viral marketing efficacy. Table 1, which is shown in the next page, provides a summary of the three studies included in this dissertation.

**TABLE 1. SUMMARY OF THREE STUDIES INCLUDED IN THIS DISSERTATION**

	<b>Study1</b>	<b>Study2</b>	<b>Study3</b>
<b>Research Objective</b>	<ul style="list-style-type: none"> <li>• To examine the current state of research on eWOM in tourism and hospitality</li> <li>• To provide an agenda for future research on eWOM in tourism and hospitality</li> </ul>	<ul style="list-style-type: none"> <li>• To examine the influence of content-, style- and source-related characteristics on receivers’ perceived usefulness of online hotel reviews</li> </ul>	<ul style="list-style-type: none"> <li>• To examine the antecedents (i.e., content-, style- and source-related characteristics) and consequence (i.e., receivers’ adoption intention) of receivers’ perceived usefulness of online hotel reviews</li> </ul>
<b>Research Method</b>	<p><b>Data source:</b></p> <ul style="list-style-type: none"> <li>• 195 full-length journal articles collected from EBSCOHost, Google Scholar and ScienceDirect</li> </ul> <p><b>Data analysis:</b></p> <ul style="list-style-type: none"> <li>• Systematic literature review</li> </ul>	<p><b>Data source:</b></p> <ul style="list-style-type: none"> <li>• 1,933 online reviews on hotels in ten European cities which were published on TripAdvisor.com</li> </ul> <p><b>Data analysis:</b></p> <ul style="list-style-type: none"> <li>• Negative binomial regression</li> </ul>	<p><b>Data source:</b></p> <ul style="list-style-type: none"> <li>• Survey responses from 1,140 participants who joined a 2 x 2 x 2 x 2 x 2 between-subject experiment</li> </ul> <p><b>Data analysis:</b></p> <ul style="list-style-type: none"> <li>• Three-way ANOVAs</li> <li>• Structural equation modeling</li> <li>• Graphical modeling</li> </ul>
<b>Key Findings</b>	<ul style="list-style-type: none"> <li>• Diversified eWOM-related topics have been investigated but scholarly attention is unevenly distributed</li> <li>• Substantial effort has been paid to understand senders’ processing of eWOM contribution, but research on firm-level receivers’ antecedents and processing of eWOM consumption are in its infancy</li> </ul>	<ul style="list-style-type: none"> <li>• Review depth, presence of photo, review readability and reviewer reputation have a positive impact on review usefulness</li> <li>• Review breadth and reviewer expertise have a negative impact on review usefulness</li> <li>• Photo volume, document-level and sentence-level linguistic style are not significant factors affecting readers’ perceived review usefulness</li> </ul>	<ul style="list-style-type: none"> <li>• Review depth and review linguistic style are found to have a positive impact on review content quality while no main effect is evident for review breadth</li> <li>• Readers rate perceived review content quality at a higher level when reviews are written using functional language</li> <li>• Reviewer reputation has a positive impact on reviewer credibility, but the main impact of reviewer expertise is absent</li> </ul>

**Research  
Contributions**

- Research inquiries and knowledge that have been discussed in extant literature has been synthesized
- An agenda for future research has been developed for contributing more knowledge or insights to the stream of eWOM research
- Redressing the research void of having limited studies exploring determinants of usefulness of online hotel reviews
- Redressing the research void of limited attention towards the impact of review language on receivers' assessment of review usefulness
- Provide practitioners in the field with clues for guiding their reviewers in writing useful reviews
- Being one of the first studies attempting to combine content-, style- and source-related characteristics in predicting readers' perceived review usefulness and adoption intention in one study
- Being one of the first studies using the experimental design approach to investigate usefulness of online reviews



## **ACKNOWLEDGEMENTS**

I would like to express my appreciation and deepest gratitude to my dissertation supervisor Prof. Astrid Dickinger for her invaluable advice, patient guidance and encouragement throughout the process of this study. She has contributed plenty of time and effort to teach me how to be a good researcher and conduct a meaningful research study. I am glad that I have a considerate and excellent supervisor like her, and I am deeply indebted to her.

I also want to thank Prof. Josef Mazanec, Prof. Arno Scharl and Dr. Zheng Xiang for the thoughtful suggestions they shared with me during and after the thesis proposal defense. Last but not least, my sincere thanks likewise go to my fiancée, parents, fellow classmates, faculties as well as administrative staff at MODUL University Vienna for their continuous support and encouragement.

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August 2017



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## **LIST OF ABBREVIATIONS**

<b>AVE</b>	<b>Averaged variance extracted</b>
<b>CFA</b>	<b>Confirmatory factor analysis</b>
<b>ELM</b>	<b>Elaboration Likelihood Model</b>
<b>eWOM</b>	<b>Electronic word-of-mouth</b>
<b>GM</b>	<b>Graphical modeling</b>
<b>IAM</b>	<b>Information Adoption Model</b>
<b>MOA</b>	<b>Motivation-Opportunity-Ability</b>
<b>RMSEA</b>	<b>Root Mean Square Error of Approximation</b>
<b>TAM</b>	<b>Technology Acceptance Model</b>
<b>WOM</b>	<b>Word-of-mouth</b>





# STUDY 1: WHAT WE KNOW AND DON'T KNOW ABOUT ELECTRONIC WORD-OF-MOUTH IN TOURISM AND HOSPITALITY

## Abstract

With the twofold objectives of (1) examining the current state of research on eWOM in tourism and hospitality (i.e., what we know) and (2) providing an agenda for future research on eWOM in tourism and hospitality (i.e., what we don't know), this study presents a systematic review of 195 eWOM-related full-length journal articles published between 2001 and 2015. Based on a nine-quadrant framework adapted from Nyilasy (2005), the findings reveal that diversified eWOM-related topics have been investigated over the past 15 years but scholarly attention is unevenly distributed. Substantial effort has been paid to understand senders' processing of eWOM contribution, whereas research on firm-level receivers' antecedents and processing of eWOM consumption are however in its infancy. This study contributes to the literature by synthesizing the research inquiries that have been discussed in extant literature. The agenda for future research developed in the current study is also expected to provide clues for subsequent researchers to contribute more knowledge or insights to the growing stream of eWOM research.

## Keywords

Electronic word-of-mouth; online reviews; user-generated content; consumer-generated media; social media; systematic review.

# 1 INTRODUCTION

As envisioned by Litvin, Goldsmith and Pan (2008) nine years ago, the number of consumers who contribute electronic word-of-mouth (eWOM) from others in the online space increase exponentially as time progresses. TripAdvisor (2017) experiences a 23-time increase in terms of number of received reviews between 2009 (i.e., 20 million) and 2016 (i.e., 465 million). Yelp (2017) received an additional 100 million reviews over the past five years, and they are now home to 121 million reviews. Indeed, since advances in the Internet and social media enhance consumers' ability to produce content through simple code-free interface, consumers are now able to access what previously were undisclosed experiences shared only within acquaintances (Labrecque, von dem Esche, Mathwick, Novak & Hofacker, 2013; Munar & Jacobsen, 2014).

Considering that consumer review sites (e.g., TripAdvisor.com and Yelp.com) are becoming popular among consumers and more online travel agencies websites (e.g., Expedia.com and Booking.com) offer eWOM and inventory in one place, eWOM in general and online reviews in particular has rapidly become an important source for consumers to make leisure and hospitality decisions, ranging from the place to spend a family holiday to where to get lunch on the third day of the visit. New research from the digital hotel marketing firm Fuel (2016) reveals that 83% of leisure travelers read reviews before making a hotel reservation, and almost one fifth of participants choose review sites as the most influential source in online hotel booking. Another study by ReviewTrackers (2016) also reports that 50% of global travelers make a purchase decision based on reviews and recommendations by past customers, and online reviews rank second only to price as the most important factor considered by travelers looking for accommodations. Barclays's (2016) latest report titled "The feedback economy" exhibits that 76% of 541 decision makers in the United Kingdom hospitality and leisure industry agreed online consumer feedback will become more important in the next five years. In the same report, that multinational corporate also forecasts online customer feedback can create an additional value of £100 million to the United Kingdom's hotel industry over the next decade. These evidences fully demonstrate that eWOM is now a prominent source of information that can influence both travelers' pre-purchase evaluation as well as tourism suppliers' business performance.

In view of the exponential growth of eWOM in both volume and significance, there has been an upsurge of academic research exploring various eWOM-related issues in the tourism and hospitality industry. Cantalops and Salvi's (2014) literature review study reports that 28 relevant articles are published in six top-tier tourism and hospitality journals between 2007 and 2011. Chen and Law (2016) recently synthesize articles pertinent to eWOM in tourism and hospitality journals in the period 2008-2013, and a total of 43 articles were found from ScienceDirect and EBSCOHost. Thanks to the brilliant works curated by researchers in the field, today, we have learnt much about what motivates consumers to contribute eWOM (e.g., Munar & Jacobsen, 2014;

Wu & Pearce, 2016), how eWOM influences consumers' perceptions and decision-making processes (e.g., Ladhari & Michaud, 2015; Vermeulen & Seegers, 2009), how eWOM affects financial performance of hotels (e.g., Duverger, 2013; Ye, Law & Gu, 2009) and what customer intelligence can be extracted from eWOM (e.g., Dickinger & Mazanec, 2015; Xiang, Schwartz, Gerdes Jr & Uysal, 2015). Undoubtedly, the accelerating production of knowledge about eWOM helps scholars and practitioners gain a better understanding about the topic. But since the body of knowledge is increasingly fragmented (i.e., diversified topics were explored) and transdisciplinary (i.e., studying context vary across different studies), the fragmentation problem, a natural outcome of richer volume of literature in one area, emerges spontaneously and poses a risk to the systematic accumulation of knowledge (King, Racherla & Bush, 2014).

To redress the fragmentation problem, Webster and Watson (2002) note that undertaking a systematic review of previous literature is of necessity when an accumulated body of research on a mature topic exists. Being a "fundamental scientific activity" in any research project (Mulrow, 1994, p. 597), many medical science scholars posit that undertaking a systematic review can benefit both academics by providing evidence to justify the research question of the academic work and practitioners by offering high quality evidence to inform policy and practice (Cook, Mulrow & Haynes, 1997; Mulrow, 1994). Harnessing a reproducible and scientific process that aims to minimize bias through exhaustive searches and analysis of published and unpublished studies, a plethora of scholars in the management and social science fields also coin that systematic reviews can map the intellectual territory of a specific academic inquiry, uncover areas where additional research is needed, assist practitioners in informing about the latest development in the field as well as assist scholar in predicting future trends in the corresponding research areas (Crossan & Apaydin, 2010; Denyer & Tranfield, 2009; Line & Runyan, 2012; Tranfield, Denyer & Smart, 2003; Webster & Watson, 2002).

In the last few years, five literature review studies pertinent to eWOM in tourism and hospitality have been published in academic journals (see Table 2). Despite their significant contribution to knowledge development, all review studies either synthesize literature published up to 2013 (e.g., Chen & Law, 2016; Lu & Stepchenkova, 2015) or revisit literature about online reviews only (e.g., Kwok, Xie & Richard, 2017; Schuckert, Liu & Law, 2015). Since recent years have seen a profound increase in the number of eWOM-related studies and online reviews are one form of eWOM only (e.g., Litvin, Goldsmith & Pan, 2008), it is believed that a further review of the most recent research is essential. Besides, Tranfield, Denyer and Smart (2003) argue that systematic reviews excel narrative reviews by employing a structural approach in literature search and synthesis. To those five extant literature review studies, while all of them provide complete information about their method of literature search, majority of them do not provide an audit trail of literature synthesis but employ an inductive approach to categorize topical clusters. Denyer and Tranfield (2009) note that the provision of an audit trail is of necessity because it demonstrates the rigor of the review process and assists scholars for future update.

Considering that the scope of published literature on eWOM in tourism and hospitality management has been developing but there is an absence of a systematic literature review article synthesizing “what we know” and highlighting “what we don’t know”, this study reviews and synthesizes all tourism and hospitality studies on eWOM using the systematic review approach. Unlike those published literature review studies as shown in Table 2, the current study employs a deductive approach and organizes the analysis based on a framework adapted from Nyilasy’s (2005) review study of traditional word-of-mouth (WOM) communication.

To be specific, the objectives of this study are twofold: (1) To examine the current state of research on eWOM in tourism and hospitality (i.e., what we know) and (2) to provide an agenda for future research on eWOM in tourism and hospitality (i.e., what we don’t know). The remainder of this study proceeds as follows. The next section will present the methodology and the organizing framework used in the current study. The study will then continue by synthesizing knowledge reflected in reviewed articles and discussing suggestions for future research on a quadrant-by-quadrant basis. Last but not least, the concluding remarks with a summary of directions for future studies will be offered in the last section.



**TABLE 2. LIST OF LITERATURE REVIEW STUDIES ON EWOM IN TOURISM AND HOSPITALITY**

<b>Author (Year)</b>	<b>Review topic / Time period</b>	<b>Data source / Keywords</b>	<b>Number of reviewed articles / Topical clusters</b>
Kwok, Xie and Richards (2017)	<p><b>Review topic:</b> Online reviews in tourism and hospitality</p> <p><b>Time period:</b> 2000 – 2015</p>	<p><b>Data source:</b> Peer-reviewed journal articles in seven top-tier hospitality and tourism journals</p> <p><b>Keywords:</b> Online reviews; consumer reviews; word-of-mouth; user-generated content</p>	<p><b>Number of reviewed articles:</b> 67</p> <p><b>Topical clusters:</b> 1) Quantitative evaluation features 2) Verbal evaluation features 3) Reputation features 4) Social features</p>
Chen and Law (2016)	<p><b>Review topic:</b> Electronic word-of-mouth in tourism and hospitality</p> <p><b>Time period:</b> 2008 – 2013</p>	<p><b>Data source:</b> Peer-reviewed journal articles collected from EBSCOHost and ScienceDirect</p> <p><b>Keywords:</b> Electronic word-of-mouth; hospitality; tourism</p>	<p><b>Number of reviewed articles:</b> 43</p> <p><b>Topical clusters:</b> 1) Nature and characteristics of eWOM 2) Antecedents of eWOM 3) Impact of eWOM</p>
Lu and Stepchenkova (2015)	<p><b>Review topic:</b> User-generated content in tourism and hospitality</p> <p><b>Time period:</b> Until April 2013</p>	<p><b>Data source:</b> Peer-reviewed journal articles and conference articles collected from Google Scholar and Web of Science</p> <p><b>Keywords:</b> Blogs; consumer-generated media; e-complaints; electronic word-of-mouth; hotel/hospitality; online reviews; restaurant; social media; social network sites; tourism/travel; user-generated content; user-generated media</p>	<p><b>Number of reviewed articles:</b> 122</p> <p><b>Topical clusters:</b> 1) Service quality 2) Destination image and reputation 3) UGC as eWOM 4) Experience and behavior 5) Mobility patterns</p>

Schuckert, Liu  
and Law (2015)

**Review topic:**  
Online reviews in tourism  
and hospitality

**Time period:**  
2004 – 2013

**Data source:**  
Peer-reviewed journal articles collected from  
EBSCOHost, ScienceDirect and  
Google Scholar

**Keywords:**  
Destinations; hotel/hospitality;  
online reviews; restaurants; tourism/travel

**Number of reviewed articles:**  
50

**Topical clusters:**  
1) Online reviews and online buying  
2) Satisfaction and management  
3) Opinion mining / Sentiment analysis  
4) Motivation  
5) Role of reviews

Cantalops and  
Salvi (2014)

**Review topic:**  
eWOM related to the  
hospitality industry

**Time period:**  
2007 – 2011

**Data source:**  
Peer-reviewed journal articles in six  
top-tier hospitality and tourism journals

**Keywords:**  
eWOM; WOM; online reviews; user-gener-  
ated content; consumer-generated content;  
online recommendation; online reputation;  
online travel communities; online opinions; e-  
satisfaction; e-complaints; social media mar-  
keting; hospitality and hotels

**Number of reviewed articles:**  
28

**Topical clusters:**  
1) Factors relating to the generation of eWOM  
2) Impact of eWOM on consumers  
3) Impact of eWOM on companies

## 2 METHODOLOGY

### 2.1 Identification and selection of studies

In January 2016, all publications about eWOM in tourism and hospitality were searched and gathered from EBSCOHost (<http://search.ebscohost.com>), Google Scholar (<http://scholar.google.com.hk>) and ScienceDirect (<http://www.sciencedirect.com>) - three of the largest and most popular online databases and search engines (Leung, Law, van Hoof & Buhalis, 2013). An expansive list of keywords, including electronic word-of-mouth, user-generated content, consumer-generated content, online review/s, online opinion/s, online complaint/s, hotel, hospitality, travel and tourism, were used since they are the subjects and contexts of the current study. All published articles and those forthcoming articles that were available online as of January 2016 were gathered to achieve a comprehensive review. To avoid false negatives (i.e., relevant articles that are not found), backward searching (i.e., reviewing the citations for the included articles), forward searching (i.e., identifying articles citing the included articles) as well as multiple rounds of literature search were conducted.

Several selection criteria were formulated to avoid false positives (i.e., articles that had only a tangential relevance to the subject of the review). First, the eWOM discussed in the included articles must follow Hennig-Thurau, Gwinner, Walsh and Gremler's (2004) definition: "any positive or negative statement made by potential, actual, or former customers about a product or company, which is made available to a multitude of people and institutions via the Internet" (p. 39). This denotes that articles analyzing communications not directed at or accessible to consumers were excluded (e.g., Loo, Boo & Khoo-Lattimore, 2013). Second, alike other review studies in different research areas (e.g., Leung, Law, van Hoof & Buhalis, 2013; Line & Runyan, 2012), only English-language full-length articles published in refereed academic journals were included. Conference articles, conference reports, book reviews as well as editor prefaces were excluded from the study owing to their limited, if any, contribution to knowledge development. Third, only empirical studies that include the analysis of either responses from human subjects or eWOM from online portals were considered. Conceptual articles (e.g., Kim & Hardin, 2010) and literature review studies (e.g., Lu & Stepchenkova, 2015) were not included for review owing to their lack of prescriptive ability. Finally, the included articles must be directly relevant to eWOM in tourism and hospitality. That is, articles that solely use travel-related eWOM to demonstrate an idea or test a proposed model were not included (e.g., Callarisa, García, Cardiff & Roshchina, 2012). Each identified article was carefully read through by the lead author to evaluate the relevance and suitability for this review following the above criteria. At the end of the database search and the reading, a total of 195 published studies were determined to be relevant and were included in the analysis. As the first identified article is compiled by L. Jean Harrison-Walker

in 2001 titled “E-complaining: a content analysis of an Internet complaint forum”, this study therefore presents a 15-year review of research on eWOM in tourism and hospitality. The list of all analyzed literature is presented in Appendix I.

## **2.2 Analysis and organization of studies**

As noted earlier, the organizing framework of this study is adapted from the one proposed in Nyilasy’s (2005) research. In his 50-year review of research on WOM communications, Nyilasy (2005) proposes a two-dimensional framework to summarize the topical clusters of WOM-related research. The first dimension is “unit of analysis”, which includes two parties of every WOM episode - sender and receiver. The second dimension is “focus of analysis” which includes antecedents and consequences, the two major topical foci of WOM-related research. King, Rachera and Bush (2014) recently employ Nyilasy’s (2005) framework in synthesizing eWOM literature, and their study distinctly demonstrates the comprehensiveness of that framework.

Notwithstanding the breadth and depth of Nyilasy’s (2005) framework, some adaptations were made in the proposed framework due to the idiosyncratic features of eWOM in tourism and hospitality and diversity of study topics. In the “unit of analysis” dimension of the proposed framework, there is a total of three levels including senders, individual-level receivers and firm-level receivers. Since individual consumers and discussed firms share dissimilar reasons for searching eWOM, adding that the influence of eWOM on individual consumers and discussed firms vary differently, it is deemed to be appropriate to separate receivers into individual-level and firm-level. Besides, in the “focus of analysis” dimension, a new level of “processing of eWOM” is added on top of “antecedents of eWOM” and “consequences of eWOM”. Given that some studies primarily aim at analyzing content shared by travelers in blog entries or examining the way receivers interpret senders’ messages in online reviews, it is believed that a new level of “processing of eWOM” should be added to better synthesize the knowledge disseminated in the reviewed studies. After making those adaptations, the revised organizing framework has a total of nine quadrants. Table 3 exhibits the developed framework with primary questions that are discussed or investigated in each quadrant.

Following the developed framework, the author reviewed and classified each of those 195 analyzed literature into the appropriate quadrants. It is acknowledged that the quadrants are not mutually exclusive and an article can possibly cover multiple foci. Hence, the articles can be classified into various quadrants. To ensure the accuracy and objectivity of the classification, an experienced academic in the research area of eWOM was invited to review the classification results. In the cases of disagreement, the authors reviewed the corresponding article again and had further discussion until a consensus was reached.

TABLE 3. ORGANIZING FRAMEWORK OF STUDY 1

Unit of analysis	Focus of analysis		
	Antecedents of eWOM	Processing of eWOM	Consequences of eWOM
Senders of eWOM	<p><b>Q1: Senders' antecedents of eWOM contribution</b></p> <ul style="list-style-type: none"> <li>- What motivates and demotivates senders to contribute eWOM?</li> <li>- What influences senders' intention to contribute eWOM?</li> </ul>	<p><b>Q2: Senders' processing of eWOM contribution</b></p> <ul style="list-style-type: none"> <li>- When, where and how senders disseminate eWOM?</li> <li>- What senders describe in eWOM?</li> </ul>	<p><b>Q3: Senders' consequences of eWOM contribution</b></p> <ul style="list-style-type: none"> <li>- How does eWOM contribution influence senders?</li> </ul>
Individual-level receivers of eWOM	<p><b>Q4: Individual-level receivers' antecedents of eWOM consumption</b></p> <ul style="list-style-type: none"> <li>- What motivates and demotivates receivers to consume eWOM?</li> <li>- What influences receivers' intention to consume eWOM?</li> </ul>	<p><b>Q5: Individual-level receivers' processing of eWOM consumption</b></p> <ul style="list-style-type: none"> <li>- When, where and how receivers seek eWOM?</li> <li>- What and how receivers analyze the received eWOM?</li> </ul>	<p><b>Q6: Individual-level receivers' consequences of eWOM consumption</b></p> <ul style="list-style-type: none"> <li>- How does eWOM consumption influence receivers?</li> </ul>
Firm-level receivers of eWOM	<p><b>Q7: Firm-level receivers' antecedents of eWOM consumption</b></p> <ul style="list-style-type: none"> <li>- What motivates and demotivates firms to consume eWOM?</li> <li>- What influences firms' intention to consume eWOM?</li> </ul>	<p><b>Q8: Firm-level receivers' processing of eWOM consumption</b></p> <ul style="list-style-type: none"> <li>- When, where and how firms seek eWOM?</li> <li>- What and how firms analyze the received eWOM?</li> </ul>	<p><b>Q9: Firm-level receivers' consequences of eWOM consumption</b></p> <ul style="list-style-type: none"> <li>- How does eWOM consumption influence firms?</li> <li>- How do firms respond after eWOM consumption?</li> </ul>

### 3 DESCRIPTIVE RESULTS

#### 3.1 Publication period and publication outlet

Figure 1 shows the distribution of the analyzed literature by publication period. As shown in Figure 1, the numbers of eWOM-related studies published in the periods 2001-2003, 2004-2006 and 2007-2009 are only two, four and 28, respectively. However, the numbers grow multiple times to 65 in the period 2010-2012 and 96 in the period 2013-2015. The figures and particularly the upward trend confirm that scholarly attention towards eWOM in tourism and hospitality has been increasing over the past 15 years.

FIGURE 1. DISTRIBUTION OF ANALYZED LITERATURE BY PUBLICATION PERIOD



TABLE 4. TOP TEN PUBLICATION OUTLETS OF ANALYZED LITERATURE

Name of academic journal	Frequency	Percent
<i>Tourism Management</i>	22	11.3%
<i>International Journal of Hospitality Management</i>	21	10.8%
<i>Journal of Travel &amp; Tourism Marketing</i>	20	10.3%
<i>Journal of Travel Research</i>	18	9.2%
<i>Journal of Hospitality Marketing &amp; Management</i>	14	7.2%
<i>International Journal of Contemporary Hospitality Management</i>	10	5.1%
<i>Journal of Vacation Marketing</i>	9	4.6%
<i>Annals of Tourism Research</i>	9	4.6%
<i>Cornell Hospitality Quarterly</i>	8	4.1%
<i>Journal of Hospitality &amp; Tourism Research</i>	7	3.6%

The analyzed articles were catalogued in 44 different academic journals and Table 4 shows the top ten publication outlets. *Tourism Management* was the most popular channel, publishing 22 articles (11.3%), followed by *International Journal of Hospitality Management* with 21 articles (10.8%) and *Journal of Travel & Tourism Marketing* with 20 articles (10.3%). Though the top ten publication outlets are all (tourism or hospitality) industry specific journals, several top-tier academic journals in the fields of business (e.g., *Journal of Business Research* with three articles), information systems (e.g., *Computers in Human Behavior* with four articles) and marketing (e.g., *Journal of Interactive Marketing* with one article) also publish research studies related to eWOM in tourism and hospitality. In this regard, the inclusion of tourism-related eWOM research in the diversity of journal outlets indirectly reflects the scholarly attention being paid to this topic is not limited to the academic community of the tourism field.

### 3.2 Unit of analysis and focus of analysis

Table 5 exhibits the distribution of articles by unit and focus of analysis. Given that forty-five studies have more than one research focus, the total frequency reported in Table 5 (i.e., 240) is larger than the number of analyzed studies in the current study (i.e., 195). In brief, a majority of the analyzed studies focus on issues at the individual talker level (with 110 instances) and individual listener level (with 98 instances). In spite of the increase in number over the past few years, research efforts on issues at the corporate listener level (with 32 instances) are still comparatively scarce. The definition of eWOM may partially explain this uneven distribution. Since eWOM is generally made by former customers and made available to prospective customers (Hennig-Thurau, Gwinner, Walsh & Gremler, 2004), they are the two core parties involved in the communications so that it is understandable why more attention has been paid to issues relating to individual talkers and individual listeners. On the other hand, corporate listeners are often found to be skeptical to reveal their business practices and data with the third party due to the fear of leaking commercial secrets. Despite the absence of valid proof, it is believed that the higher level of difficulty in soliciting responses or data from corporate listeners is another possible reason explaining why issues at the corporate listener level were rarely explored.

The foci of studies on eWOM in tourism and hospitality are drastically uneven albeit diverse. Among the nine research foci, Q2 (i.e., the quadrant focusing on examining the content written by senders and the way senders disseminate eWOM) is the most popular research focus with 88 instances. Since the retrieval and analysis of content in consumer-generated eWOM has proven to be an effective and unobtrusive method for harvesting customer intelligence and identifying the areas in need of improvement for businesses (O'Connor, 2010; Pantelidis, 2010), it is not surprising why Q2 has received constant levels of attention from tourism and hospitality researchers over the past 15 years. The second and third most researched foci are Q5 (with 49 instances) and Q6 (with 38 instances), which stress on investigating how eWOM consumption

(or its various forms and characteristics) affect individual-level consumers' cognition, attitude and behavioral intention, respectively. Q7 and Q8 have received exceptionally low attention from scholars. Only one study attempts to explore firm-level receivers' antecedents of eWOM consumption, and only two studies have explored the source and way firms analyze eWOM. One interesting observation in Table 5 is that scholarly attention towards Q5 and Q6 has increased drastically from the period 2010-2012 to 2013-2015. As the ubiquitous nature of eWOM (particularly online reviews) coupled with their prominent impact on business performance were coined in several studies conducted between 2007 and 2012 (e.g., Öğüt & Onur Taş, 2012; Ye, Law & Gu, 2009), many researchers acknowledge the urgency in understanding how to predict and respond to consumer behavior in a rapidly changing environment. Table 6 lists the research foci assigned to the analyzed articles. In the subsequent sections, the key findings and discussions in the works of each research focus will be presented on a quadrant-by-quadrant basis.

**TABLE 5. DISTRIBUTION OF ANALYZED LITERATURE BY FOCUS AND UNIT OF ANALYSIS**

Unit / Focus of analysis	Publication period <sup>b</sup>					Total <sup>b</sup>
	2001-2003	2004-2006	2007-2009	2010-2012	2013-2015	
<b>By unit of analysis</b>						
Senders of eWOM	1	2	17	41	49	<b>110</b>
Individual-level receivers of eWOM	2	1	10	30	55	<b>98</b>
Firm-level receivers of eWOM	-	2	5	8	17	<b>32</b>
<b>By focus of analysis</b>						
Q1: Senders' antecedents	-	-	1	7	10	<b>18</b>
Q2: Senders' processing	1 (1)	2 (1)	15 (1)	34 (1)	36 (1)	<b>88 (1)</b>
Q3: Senders' consequences	-	-	1	-	3	<b>4</b>
Q4: Individual-level receivers' antecedents	-	-	3	3	5	<b>11</b>
Q5: Individual-level receivers' processing	1 (1)	-	5 (2)	13 (3)	30 (2)	<b>49 (2)</b>
Q6: Individual-level receivers' consequences	1 (1)	1 (3)	2	14 (2)	20 (3)	<b>38 (3)</b>
Q7: Firm-level receivers' antecedents	-	-	1	-	-	<b>1</b>
Q8: Firm-level receivers' processing	-	-	-	-	2	<b>2</b>
Q9: Firm-level receivers' consequences	-	2 (1)	4 (3)	8	15	<b>29</b>
<b>Grand total <sup>a</sup></b>	<b>3</b>	<b>5</b>	<b>32</b>	<b>79</b>	<b>121</b>	<b>240</b>

**Note:**

<sup>a</sup> The grand total is larger than the number of analyzed studies (i.e., 195) because 45 studies have more than one research focus.

<sup>b</sup> (1) represents the most researched focus in that publication period; (2) and (3) represent the second and third most researched foci in that publication period.



TABLE 6. LIST OF RESEARCH FOCI AND ASSOCIATED PUBLICATIONS

Unit	Focus	Publications
<b>Senders of eWOM</b>		
<b>Q1: Senders' antecedents of eWOM contribution</b>		
	<b>What motivates and demotivates senders to contribute eWOM?</b>	Bronner & de Hoog (2011); Jeong & Jang (2011); Munar & Jacobsen (2014); Sparks & Browning (2010); <i>Wei, Miao &amp; Huang (2013)</i> ; Wilson, Murphy & Fierro (2012); Wu & Pearce (2016); Yoo & Gretzel (2008; 2011)
	<b>What influences senders' intention to contribute eWOM?</b>	Bilgihan, Peng & Kandampully (2014); Boo & Kim (2013); Cheung & Lee (2012); <i>Hernández-Méndez, Muñoz-Leiva &amp; Sánchez-Fernández (2015)</i> ; Huang, Basu & Hsu (2010); Kang & Schuett (2013); Kim, Jang & Adler (2015); Yang (2017); Yen & Tang (2015)
<b>Q2: Senders' processing of eWOM contribution</b>		
	<b>When, where and how senders disseminate eWOM?</b>	<i>Bronner &amp; de Hoog (2011)</i> ; Lee & Gretzel (2014); <i>Lee &amp; Tussyadiah (2011)</i> ; Munar & Jacobsen (2013); <i>Munar &amp; Jacobsen (2014)</i> ; Ring, Tkaczynsk & Dolnicar (2016); <i>Wilson, Murphy &amp; Fierro (2012)</i> ; <i>Yen &amp; Tang (2015)</i> ; <i>Yoo &amp; Gretzel (2011)</i>
	<b>What senders describe in eWOM?</b>	Arsal, Woosnam, Baldwin & Backman (2010); Assimakopoulos, Papaioannou, Sarmaniotis & Georgiadis (2015); Banyai (2010; 2012); Barreda & Bilgihan (2013); Berezina, Bilgihan, Cobanoglu & Okumus (2016); Berger & Greenspan (2008); Björk & Kauppinen-Räsänen (2012); Bulchand-Gidumal, Melián-González & López-Valcárcel (2011); Capriello, Mason, Davis & Crotts (2013); Carson (2008); Chen, Chen & Wang (2012); Choi, Lehto & Morrison (2007); Cong, Wu, Morrison, Shu & Wang (2014); Crotts, Mason & Davis (2009); Dickinger & Mazanec (2015); Dwivedi, Yadav & Patel (2009); Ekiz, Khoo-Lattimore & Memarzadeh (2012); Enoch & Grossman (2010); Girardin, Calabrese, Dal Fiore, Ratti & Blat (2008); Gong, Xie, Peng & Guan (2015); Goulding, Saren & Lindridge (2013); Guo, Sun, Schuckert & Law (2016); Harrison-Walker (2001); Hunter (2016); Jani & Hwang (2011); Jeong & Jeon (2008); Kim & Lehto (2012); Law & Cheung (2010); Lee & Hu (2004); Leung, Law & Lee (2011); Levy, Duan & Boo (2013); Li & Wang (2011); Li, Law, Vu & Rong (2013); Li, Lin, Tsai & Wang (2015); Li, Ye & Law (2013); Liu, Law, Rong, Li & Hall (2013); Lu & Stepchenkova (2012); Luo & Zhong (2015); Magnini, Crotts & Zehrer (2011); Magnini, Kara, Crotts & Zehrer (2012); Martin, Woodside & Dehuang (2007); Michaelidou, Siamagka, Moraes & Micevski (2013); Mkono (2013); Mkono, Markwell & Wilson (2013); O'Connor (2010); Ong & du Cros (2012); Pan, MacLaurin & Crotts (2007); Pang, Hao, Yuan, Hu, Cai, & Zhang (2011); Pantelidis (2010); Pearce (2012); Pekar & Ou (2008); Racherla, Connolly & Christodoulidou (2013); Schmallegger & Carson (2009); Schuckert, Liu & Law (2015); Schuckert, Liu & Law (2016); Shakeela & Weaver (2012); Shea, Enghagen & Khullar (2004); <i>Sparks &amp; Bradley (2017)</i> ; <i>Sparks &amp; Browning (2010)</i> ; Stepchenkova & Zhan (2013); Stringam & Gerdes Jr (2010); Stringam,

Gerdes Jr & Vanleeuwen (2010); Tse & Zhang (2013); Tussyadiah & Fesenmaier (2008); Tuzovic (2010); Volo (2010); Wang & Hung (2015); Wang, Park & Fesenmaier (2012); Wenger (2008); Woodside, Cruickshank & Dehuang (2007); Wu, Wall & Pearce (2014); Xiang, Schwartz, Gerdes Jr & Uysal (2015); Ye, Li, Wang & Law (2014); Zhang & Mao (2012); Zhang, Ye, Song & Liu (2015); Zheng, Youn & Kincaid (2009); Zheng, Zha & Chua (2012); Zhou, Ye, Pearce & Wu (2014)

### **Q3: Senders' consequences of eWOM contribution**

#### **How does eWOM contribution influence senders?**

Kim & Fesenmaier (2015); Liu, Schuckert & Law (2016); Schuckert, Liu & Law (2016); Watson, Morgan & Hemmington (2008)

### **Individual-level receivers of eWOM**

### **Q4: Individual-level receivers' antecedents of eWOM contribution**

#### **What motivates and demotivates receivers to consume eWOM?**

Chen, Nguyen, Klaus & Wu (2015); Cox, Burgess, Sellitto & Buultjens (2009); Kim, Mattila & Baloglu (2011); Hwang, Jani & Jeong (2013)

#### **What influences receivers' intention to consume eWOM?**

Ayeh, Au & Law (2013a; 2013b); Casaló, Flavián & Guinalú (2011); Cheung, Lee & Rabjohn (2008); Filieri & McLeay (2014); Gretzel, Kang & Lee (2008); Yoo & Gretzel (2010)

### **Q5: Individual-level receivers' processing of eWOM consumption**

#### **When, where and how receivers seek eWOM?**

Cox, Burgess, Sellitto & Buultjens (2009); Gretzel, Kang & Lee (2008); Hernández-Méndez, Muñoz-Leiva & Sánchez-Fernández (2015); Hwang, Jani & Jeong (2013); Jacobsen & Munar (2012); Lee & Tussyadiah (2011)

#### **What and how receivers analyze the received eWOM?**

Black & Kelley (2009); Book, Tanford, Montgomery & Love (2015); Browning, So & Sparks (2013); Casaló, Flavián, Guinalú & Ekinci (2015); Chen, Shang & Li (2014); Cheng & Loi (2014); Cox, Burgess, Sellitto & Buultjens (2009); Dickinger (2011); Fang, Ye, Kucukusta & Law (2016); Filieri (2015); Hautz, Füller, Hutter & Thürriidl (2014); Hernández-Méndez, Muñoz-Leiva & Sánchez-Fernández (2015); Herrero, San Martín & Hernández (2015); Huang, Chou & Lin (2010); Jacobsen & Munar (2012); Jin & Phua (2016); Kusumasondjaja, Shanka & Marchegiani (2012); Ladhari & Michaud (2015); Lee & Tussyadiah (2011); Lee, Law & Murphy (2011); Liu & Park (2015); Liu, Schuckert & Law (2016); Mack, Blose & Pan (2008); Marchiori & Cantoni (2015); Mattila & Mount (2003); Maur & Minazzi (2013); Min, Lim & Magnini (2015); Noone & McGuire (2014); Ong (2012); Papathanassis & Knolle (2011); Park & Nicolau (2015); Park, Xiang, Josiam & Kim (2014); Schuckert, Liu & Law (2016); Sparks & Browning (2011); Sparks, Perkins & Buckley (2013); Tanford & Montgomery (2015); Sparks, So & Bradley (2016); Tsaur, Huang & Luoh (2014); Tussyadiah, Park & Fesenmaier (2011); Vermeulen & Seegers (2009); Williams, van der Wiele & van Iwaarden (2010); Wei, Miao & Huang (2013); Xia (2013); Xie, Miao, Kuo & Lee (2011); Zehrer, Crotts & Magnini (2011); Zhang (2015); Zhang, Wu & Mattila (2016)

**Q6: Individual-level receivers' consequences of eWOM consumption**

**How does eWOM consumption influence receivers?**

Book, Tanford, Montgomery & Love (2015); Browning, So & Sparks (2013); Casaló, Flavián, Guinalú & Ekinci (2015); *Chen, Shang & Li (2014)*; Cheng & Loi (2014); *Filieri (2015)*; Gu & Ye (2014); Hautz, Füller, Hutter & Thürridl (2014); *Huang, Chou & Lin (2010)*; Jalilvand & Samiei (2012); Jalilvand, Samiei, Dini & Manzari (2012); Jin & Phua (2016); Ladhari & Michaud (2015); Lee & Cranage (2014); Lim, Chung & Weaver (2012); Lin & Huang (2006); Månsson (2011); Mattila & Mount (2003); Maur & Minazzi (2013); Noone & McGuire (2013; 2014); Sparks & Browning (2011); Sparks, Perkins & Buckley (2013); *Stringam, Gerdes Jr & Vanleeuwen (2010)*; Stylianou-Lambert (2012); Tanford & Montgomery (2015); Tsao, Hsieh, Shih & Lin (2015); Tussyadiah & Fesenmaier (2009); *Tussyadiah, Park & Fesenmaier (2011)*; Vermeulen & Seegers (2009); *Volo (2010)*; Wang (2011); Xie, Miao, Kuo & Lee (2011); Zhang (2015); Zhang, Wu & Mattila (2016); Zhang, Ye & Law (2011); Zhang, Ye, Law & Li (2010); Zhao, Wang, Guo & Law (2015)

**Firm-level receivers of eWOM**

**Q7: Firm-level receivers' antecedents of eWOM consumption**

**What motivates and demotivates operators to consume eWOM?**

Pühringer & Taylor (2008)

**Q8: Firm-level receivers' processing of eWOM consumption**

**What and how firms analyze the received eWOM?**

Park & Allen (2013); Torres, Adler, Behnke, Miao & Lehto (2015)

**Q9: Firm-level receivers' consequences of eWOM consumption**

**How does eWOM consumption influence operators?**

Blal & Sturman (2014); Duverger (2013); Dwivedi, Shibu & Venkatesh (2007); Hills & Cairncross (2011); Kim, Lim & Brymer (2015); Lu, Ba, Huang & Feng (2013); Melián-González, Bulchand-Gidumal & López-Valcárcel (2013); Öğüt & Onur Taş (2012); Phillips, Zigan, Silva & Schegg (2015); Torres, Singh & Robertson-Ring (2015); Xie, Zhang & Zhang (2014); Xie, Chen & Wu (2016); Yacouel & Fleischer (2012); Ye, Law & Gu (2009); Ye, Law, Gu & Chen (2011)

**How do operators respond after eWOM consumption?**

Akehurst (2009); *Hills & Cairncross (2011)*; *Kim & Lehto (2012)*; *Lee & Hu (2004)*; *Levy, Duan & Boo (2013)*; Liu, Kim & Pennington-Gray (2015); Liu, Schuckert & Law (2015); *O'Connor (2010)*; Sigala (2012); Sparks & Bradley (2017); *Sparks, So & Bradley (2016)*; *Torres, Adler, Behnke, Miao & Lehto (2015)*; Tyrrell & Woods (2004); Zhang & Vásquez (2014)

**Note:** The secondary research focus of each study is presented in italicized text.

## 4 WHAT WE KNOW AND WHAT WE DON'T KNOW ABOUT EWOM IN TOURISM AND HOSPITALITY

### 4.1 Senders' antecedents of eWOM contribution

#### 4.1.1 What we know

Tourism and hospitality researchers start identifying answers to the questions of “what influences senders' intention to contribute eWOM?” and/or “what motivates and demotivates senders to contribute eWOM?” since 2008. Sixteen studies primarily focus on this quadrant, and Table 7 lists all factors affecting senders' eWOM contribution which are discussed in the analyzed literature. MacInnis and Jaworski (1989) posit that the degree to which individuals process information is based on three factors: motivation, opportunity, and ability. As per MacInnis and Jaworski's (1989) description, motivation refers to one's desire or readiness to engage in behavior. Opportunity represents all situational factors that can either enhance or impede the desired outcome (e.g., time availability), whereas ability is the extent to which consumers have the necessary resources (e.g., knowledge) to make an outcome happen. Considering the breadth and depth of MacInnis and Jaworski's (1989) motivation-opportunity-ability (MOA) theory, this study employs MOA theory as the framework for classifying the identified factors.

As shown in Table 7, an extensive list of motivation-related factors and opportunity-related factors were discussed in the analyzed literature. Ten motives triggering senders' eWOM contribution are identified, and helping other consumers is the most frequently mentioned one. Indeed, no matter whether the study context is hotel (e.g., Sparks & Browning, 2010), restaurant (e.g., Yang, 2017) and travel in general (e.g., Bronner & de Hoog, 2011), previous studies consistently report that eWOM senders contribute eWOM with the primary aim of enabling other consumers to make a good decision. In their pioneering work with TripAdvisor members who have previously posted online travel reviews, Yoo and Gretzel (2008) describe that online travel review writers are mostly motivated by saving others from having the same negative experience as them. Wu and Pearce (2016) also report that altruism, a concept which is equivalent to being helpful to others, is one of the six motives that Chinese tourists invest time in creating online travel blogs. Increasing positive self-enhancement and helping service providers are the second and third most frequently mentioned motives among the analyzed studies. In their study with café customers, Kim, Jang and Adler (2015) verify that one's desire for positive recognition from others can motivate him/her to add a post about a café on social networking sites. Yang (2017) tests and notes that individuals would exhibit reciprocity toward restaurants because of a satisfied experience, and thereby having higher intention to share positive eWOM. In addition to the above three, but to a lesser extent, motives like maintaining connection with other members

(e.g., Cheung & Lee, 2012), venting negative feelings (e.g., Yen & Tang, 2015), increasing positive status-enhancement (e.g., Wu & Pearce, 2016) and others have also been discussed in prior literature.

Besides exploring senders' motives to eWOM contribution, a number of situational factors have proven to be impactful on one's proneness of eWOM contribution. Sender's time constraint is one of the most discussed situational factors. Being one of the three main barriers for consumer-generated media creation, Yoo and Gretzel (2011) report that many American travelers are motivated to create consumer-generated media but hindered by time constraint. Huang, Basu and Hsu (2010) also note that college students in the United States are not motivated to share travel knowledge via social networking sites because that activity was too time consuming to them. Sender's concern about privacy infringement and sender's willingness to share personal experience are another two situational factors reported in multiple studies. For example, Yoo and Gretzel (2011) describe that privacy concern is one type of structural barriers hindering travelers' intention to create travel consumer-generated media. The cross-country study by Wilson, Murphy and Fierro (2012) echoes and exhibits that Spanish do not post user-generated content because they want to keep the trip or experience a secret. Jeong and Jang (2011) as well as Yang (2017) report that sender's perceived quality of experience has certain impact on eWOM intention. Given the fact that consumption experiences act as powerful sources of human motivation, Jeong and Jang (2011) highlight that restaurant service employees who create a satisfactory service experience can trigger customers' positive eWOM and it is motivated by customers' desire to support the restaurant and to express personal positive feelings. The potential impact of sender's profile and personality on their motivation to and/or proneness to contribute eWOM are certified. Several studies postulate and confirm the existence of variation in eWOM contribution across sender's personality traits (e.g., Yoo & Gretzel, 2011), opinion leadership (e.g., Kim, Jang & Adler, 2015) and age (e.g., Munar & Jacobsen, 2014).

With regard to the ability-related factor, the direct impact of sender's eWOM contribution experience, self-confidence as well as language ability are verified in Boo and Kim's (2013) study with customers at a franchise restaurant in the Mid-Atlantic area of the United States. Moreover, the empirical findings in two studies demonstrate the positive albeit indirect impact of sender's social media usage experience in eWOM contribution (Kang & Schuett, 2013; Munar & Jacobsen, 2014).

**TABLE 7. FACTORS AFFECTING SENDERS' eWOM CONTRIBUTION DISCUSSED IN ANALYZED LITERATURE**

<b>Factors</b>	<b>References <sup>a</sup></b>
<b>Motivation-related factor</b>	
<b>Sender's motive to contribute</b>	
Helping other customers	(1)(2)(3)(4)(5)(6)(8)(11)(13)(14)(15)
Increasing positive self-enhancement	(1)(4)(5)(6)(13)(14)(15)(16)
Helping service providers	(1)(4)(5)(6)(11)(13)(15)
Maintaining social connection	(6)(8)(13)(14)(15)
Venting negative feelings	(1)(2)(4)(6)(15)
Increasing positive status-enhancement	(8)(13)(14)
Documenting experience	(3)(14)
Enforcing service improvement by collective power	(6)(15)
Obtaining travel information	(3)
Earning economic incentives	(15)
<b>Opportunity-related factor</b>	
<b>Situational factors affecting sender's proneness to contribute</b>	
Sender's time constraint	(3)(4)(7)
Sender's concern about privacy infringement	(3)(4)(7)
Sender's willingness to share personal experience	(3)(4)(7)
Sender's perceived quality of consumption experience	(5)(11)(16)
Sender's willingness to be part of online community	(3)
Sender's concern about retribution	(7)
Sender's preference for email communication	(9)
Sender's consumption condition	(9)
Sender's perceived enjoyment of eWOM contribution	(10)
Sender's perceived usefulness of review website	(11)
Sender's susceptibility to interpersonal influence	(12)
<b>Sender's profile and personality</b>	
Sender's personality	(4)(11)
Sender's opinion leadership	(12)(16)
Sender's nationality	(7)
Sender's age	(13)
<b>Ability-related factor</b>	
Sender's social media usage experience	(10)(13)
Sender's eWOM contribution experience	(9)
Sender's self-confidence in voicing concerns	(9)
Sender's language ability	(9)

**Note:** <sup>a</sup> (1): Yoo & Gretzel (2008); (2): Sparks & Browning (2010); (3): Huang, Basu & Hsu (2010); (4): Yoo & Gretzel (2011); (5): Jeong & Jang (2011); (6): Bronner & de Hoog (2011); (7): Wilson, Murphy & Fierro (2012); (8): Cheung & Lee (2012); (9): Boo & Kim (2013); (10): Kang & Schuett (2013); (11): Yang (2017); (12): Bilgihan, Peng & Kandampully (2014); (13): Munar & Jacobsen (2014); (14): Wu & Pearce (2016); (15): Yen & Tang (2015); (16): Kim, Jang & Adler (2015).

### **4.1.2 What we don't know**

Apparently, the existing knowledge about sender's antecedents of eWOM contribution are extensive but uneven. Compared to motivation-related and opportunity-related factors, sender's ability-related factors have seldom been the matter of prime interest in the eyes of previous researchers. Hence, more scholarly attention should be dedicated to explore if other ability-related factors (e.g., sender's proficiency in contributing eWOM; sender's knowledge about where they can share eWOM) may increase or reduce one's eWOM contribution intention. On the other hand, as already highlighted by Cantallops and Salvi (2014), the weight of motives leading senders to generate eWOM is still unclear even though much attention has been paid to understand sender's motives to contribute eWOM. Given the fact that understanding what drives eWOM providers is essential in formulating strategies for managing the interaction with opinion leaders, there is still a lot of work to do to comprehensively understand the primary motive triggering senders' momentum to contribute eWOM.

Since extant studies are mostly conducted in the contexts of hotel (e.g., Sparks & Browning, 2010; Yen & Tang, 2015), restaurants (e.g., Jeong & Jang, 2011; Yang, 2017) and travel in general (e.g., Bronner & de Hoog, 2011; Munar & Jacobsen, 2014), the examination of eWOM contribution in the airline, attraction and even cruise contexts as well as the difference in motives across contexts are potential areas for future research. Finally, given that a comprehensive list of factors is synthesized from prior studies (see Table 7), future researchers can harness structural analysis to better understand the underlying mechanism of "What influences senders' intention to contribute eWOM".

## **4.2 Senders' processing of eWOM contribution**

### **4.2.1 What we know**

As mentioned in sub-section 3.2, the examination of senders' processing of eWOM contribution has attracted extensive and constant attention from scholars over the past 15 years. While this topical focus has been extensively documented in the literature, most studies in this quadrant primarily explore "what senders describe in eWOM?" while knowledge about "when, where and how senders disseminate eWOM?" is rather limited. Munar and Jacobsen's (2013) study is one of the few which aims at examining where and when tourists share online content. Drawing on the analysis of survey responses by 405 Danish- and Norwegian-speaking holiday-makers visiting Mallorca, the researchers claim that the most frequent channel for sharing content about their holidays is not through social media sites but via short message services or email systems. Lee and Gretzel (2014) as well as Ring, Tkaczynski and Dolnicar (2016) empirically demonstrate that sharing holiday experience online is not a homogeneous activity. Lee and Gretzel (2014) notice

that senders' cultural orientation and social identity would partly affect where they choose to document their travel experience. Using cluster analysis, Ring, Tkaczynski and Dolnicar (2016) identify five segments of information sharers (i.e., offline verbalists, offline visualists, online verbalists, online visualists and interactive sharers) according to content they shared and channel they used.

Among those studies addressing the question of "what senders describe in eWOM?", they can generally be classified into four groups based on their content subjects: (1) Experience as represented in eWOM, (2) Failure as represented in eWOM, (3) Image as represented in eWOM and (4) Market intelligence as represented in eWOM.

#### **4.2.1.1 Experience as represented in eWOM**

Comparing to traditional WOM, it is indisputable that eWOM is far more voluminous in quantity and content richness since the Internet and social media provide a bigger group of contributors with an efficient vehicle for sharing information, experience, commentaries and advices (Litvin, Goldsmith & Pan, 2007). As researchers increasingly recognize the informativeness of eWOM, they start systematically analyzing consumer-generated content in order to better understand and improve customer experience. Pan, MacLaurin and Crofts (2007) are one of the pioneers who demonstrate the kaleidoscopic nature of travel blogs in representing travelers' travel experiences. By means of analyzing blog entries about visitors' experience in Charleston, their study demonstrates that every aspect of the travel experience is manifested in the travel blog content and analysis of travel blogs can reveal in-depth information about the competitive environment of a destination. Wenger (2008) and Volo (2010) later cement the notions by Pan, MacLaurin and Crofts (2007) in their subsequent studies on blog entries by tourists visiting Austria and South Tyrol. Although Volo (2010, p. 302) recognizes that travelers seldom communicate their "experience essence" (e.g., moods and sensations) in their narratives, she stresses that a well performed analysis of blog entries posted on a destination marketing organization website allows for profiling of tourists and understanding their travel paths and related actions. Besides analyzing general travel experiences, experiences with different forms of tourism have also been extensively studied by academic researchers. These include, but are not limited to, adventure tourism (e.g., Berger & Greenspan, 2008), backpacking tourism (e.g., Enoch & Grossman, 2010), farm tourism (e.g., Capriello, Mason, Davis & Crofts, 2012) and wildlife tourism (e.g., Cong, Wu, Morrison, Shu & Wang, 2015).

Blog entries and online reviews describing customer experience in the accommodation context have also been analyzed by several researchers (e.g., Jeong & Jeon, 2008; Dickinger & Mazanec, 2015; Racherla, Connolly & Christodoulidou, 2013). Through analyzing guest ratings of 139 New York hotels shown on TripAdvisor.com, Jeong and Jeon (2008) note that reviewers have a better



staying experience in chain-affiliated hotels than independent hotels. In particular, chain-affiliated hotels excel their independent counterparts in the areas of room amenities, check-in and check-out as well as business service. Barreda and Bilgihan (2013) utilize NVivo to content analyze 920 reviews of hotels in Northeast United States on TripAdvisor.com, with the purposes of identifying the areas for service improvement and strategies to reinforce brand image. They claim when travelers are pleased with the quality of human contact offerings by a well-trained employee, they tend to feel more satisfied and to form a positive brand image. It is surprising that experience in restaurants, another key sector of the hospitality industry, is rarely explored except Mkonzo (2013) and Pantelidis, (2010). Applying the thematic analysis to synthesize consumer reviews at five Victoria Falls restaurants from IgoUgo.com, TripAdvisor.com and Virtual-Tourist.com, Mkonzo, Markwell and Wilson (2013) is another limited work in this stream and they notice that food in the Zimbabwean destination context is viewed as a peak experience than a commodity supplying nutrients and energy in the eyes of tourists.

#### **4.2.1.2 Failure as represented in eWOM**

With the dual purposes of reducing cases of double deviations and enabling implementation of effective service recovery, nine studies, including the first identified study in the analyzed set (i.e., Harrison-Walker, 2001), stress on understanding service failure profiles from online complaints or eWOM in general. Five out of nine studies are related to the hotel industry. Despite the difference in study context and location, most studies consistently report that guestroom condition (e.g., cleanliness) and service quality issues (e.g., expected services are not delivered) are the most frequently reported problem areas (Ekiz, Khoo-Lattimore & Memarzadeh, 2012; Lee & Hu, 2004; Levy, Duan & Boo, 2013; Zheng, Youn & Kincaid, 2009). Given that minor and inconsequential services failures can result into online complaints, all contributors of those hotel-related studies conclude by advising hoteliers to carefully listen to guest feedback and attend to even the smallest things. Lee and Hu (2004) conclude their study by recommending hotels' customer relations departments to regularly log on to online comment sites to monitor the comments and report to the general managers or supervisors in the relevant divisions. In accordance with Lee and Hu (2004), Levy, Duan and Boo (2013) advise hoteliers to establish a reputation management plan and feedback system in order to deal with unsolicited feedback from consumers available on social media portals.

Apart from reviewing service failures reported in online hotel reviews, previous researchers have analyzed the integrity issues against travel agencies in China (Gong, Xie, Peng & Guan, 2015), complaints towards specific airline company (Harrison-Walker, 2001) and airlines' frequent flier program (Tuzovic, 2010). Utilizing complaints published on People's Daily complaint platform as the data source, Gong, Xie, Peng and Guan (2015) identify a total of 118 integrity issues against traditional and online travel agencies in China. Based on their description, around

two-third (64.4%) of those integrity issues occur in the delivery process of travel services such as arbitrarily changing the itinerary, providing low-quality tour package and forcing tourists to buy free-choice services. Alike Gong, Xie, Peng and Guan (2015), Kim and Lehto (2012) uncover critical service failure incidents in the disabled traveler market, and over half of the identified incidents are service or product delivery issues (e.g., poor design for handicapped access).

#### **4.2.1.3 Image as represented in eWOM**

Beer and Burrows' (2010) seminal paper posits that the exponential growth of social media and especially participatory websites has threatened the hegemony of traditional content generators like one-way advertising and expert critics as primary sources of legitimate information. Since the information is less controllable by destination marketers and advertisers, several studies are conducted to investigate what images dominate the Internet and whether these images are consistent with the one projected by destination marketers. Choi, Lehto and Morrison (2007) found this research stream on their study titled "Destination image representation on the web: Content analysis of Macau travel related websites". Through analyzing Macau's online tourism image representations in various travel-related web information sources, the authors notice the discrepancy between projected image by the Macau tourism authority and perceived images by other parties. In another exploratory study on South Australia's Flinders Ranges destination image projected on various consumer generated content sites, Schmallegger and Carson (2008) however report that the functional image perceived by young international travelers and local four-wheel-drive travelers are consistent with the image projected by Flinders Ranges' destination marketing organizations. Apart from the above two studies, a plethora of subsequent researchers have unveiled the perceived image of various country-level destinations like Peru (e.g., Stepchenkova & Zhan, 2013) and China (e.g., Li & Wang, 2011) as well as city-level destinations like Hong Kong (e.g., Leung, Law & Lee, 2011) and Kaohsiung (e.g., Chen, Chen & Wang, 2012) by travelers.

Two dramatic changes are noticed among all studies in this stream as time progresses. First, researchers employ a more rigorous approach as time goes by. Most early studies are exploratory and utilize unstructured approach to analyze writers' perceived image. Carson (2008) recognizes and criticizes that researchers should employ a structural framework for content analyzing consumer-generated content instead of using unstructured approaches. After Carson demonstrates how to analyze destination image with structured framework in his succeeding work (i.e., Schmallegger & Carson, 2009), subsequent papers in this stream follow and employ structural approach. Second, as more online community sites allowing users to attach photos with their blog entries or reviews, pictorial data are increasing used as the data source for comprehending writers' perceived image. As textual content in blog entries and online travelogues have been extensively researched in early studies (e.g., Dwivedi, Yadav & Patel, 2009; Leung,

Law & Lee, 2011), recent studies in this stream start analyzing online photos shared by travelers (e.g., Hunter, 2016; Stepchenkova & Zhan, 2013). Hunter (2016) recently compares the image of Seoul represented by photographs online with the traditional projected images found in printed brochures and guidebooks. He states that traditional projected image (e.g., waterways) and traditional tourist attractions (e.g., Seoul Tower) are absent on Korean-based search engine, connoting that Korean residents are not interested in traditional projected images. Interestingly, representations of other non-Seoul destinations (e.g., Tokyo and Jeju) are found on Seoul-related photographs from Google and Baidu. This implies that international visitors to Seoul may be visiting multiple destinations.

#### **4.2.1.4 Market intelligence as represented in eWOM**

Due to the independence of the message source and the lack of commercial self-interest (Wirtz & Chew, 2002), eWOM has long been recognized as a credible source of information because customers often honestly evaluate strengths and weaknesses of the products and services. Considering that eWOM content explicitly and implicitly reflect what customers like and dislike about the products and services, numerous researchers analyze and demonstrate that eWOM provides them with a window for identifying factors leading to customer satisfaction and/or critical success factors in their corresponding disciplines.

Studies exploiting intelligence from eWOM are mostly conducted in the hotel context, and contributors often utilized reviews on TripAdvisor.com as data source (e.g., Berezina, Bilgihan, Cobanoglu & Okumus, 2016; O'Connor, 2010; Magnini, Crofts & Zehrer, 2011). According to his analysis on TripAdvisor reviews of London hotels, O'Connor (2010) report that accessible location is the most frequently mentioned aspect by satisfied customers. Magnini, Crofts and Zehrer (2011) garner support for O'Connor (2010) as they also find that the most frequent reported sources of customer delight are location, customer service and cleanliness. Applying text mining technique to analyze 2,510 TripAdvisor reviews of hotels in Sarasota, the empirical findings in Berezina, Bilgihan, Cobanoglu and Okumus' (2016) work show that tangible aspects (e.g., rooms & furnishing) of hotels are discussed more frequently in negative reviews whereas intangible aspects (e.g., service) are discussed more often in positive reviews. Except TripAdvisor.com, eWOM publishing on Agoda.com (e.g., Zhou, Ye, Pearce & Wu, 2014), Ctrip.com (e.g., Wang & Hung, 2015), Expedia.com (e.g., Xiang, Schwartz, Gerdes Jr & Uysal, 2015) and DaoDao.com (e.g., Li, Ye & Law, 2013) have also been vetted, and many insightful results were reported. For instance, Bulchand-Gidumal, Melián-González and López-Valcárcel (2011) describe that offering free Wi-Fi works well in terms of significantly improving guest satisfaction levels. Zhou, Ye, Pearce and Wu (2014) review over 1,300 reviews on 4-star and 5-star hotels on Agoda.com, and identify 23 attributes influencing hotel customer satisfaction.

Besides focusing on the hotel context, some scholars extend this research stream to other contexts like cruise and attraction. Guo, Sun, Schuckert and Law (2016) successfully extract seven critical success factors in attraction management (i.e., environment, experience, location and/or transportation, price, purpose, target groups/suitability and time) using computerized content analysis on 4,831 helpful reviews of sixteen Hong Kong attractions. Zhang, Ye, Song and Liu (2015) synthesize over 40,000 reviews of 167 vessels on *cruisecritic.com*, and exhibit that public rooms is the most important determinant of satisfaction with a cruise ship, followed by perceived service quality and spa and fitness. They also list exclusive satisfiers and dissatisfiers for larger ships and smaller ships in the same study.

The revelation of tourist mobility patterns via retrieval and analysis of eWOM is another type of intelligence previous researchers have investigated. By tracking passive digital footprint like geo-referenced photos published by travelers on *Flickr.com* and cell phone network data, Girardin, Calabrese, Dal Fiore, Ratti and Blat (2008) exhibit that unconsciously produced content (e.g., geo-referenced photos) can be effectively utilized for revealing the presence and movement pattern of a city's tourists. Zheng, Zha and Chua (2012) also attempt to unveil mobility and behaviors of tourists in Paris, London, San Francisco and New York through analyzing and visualizing over 767,000 user-generated photos from *Flickr.com*. By means of exhibiting the regions of attraction as well as their corresponding tourist traffic flow based on the frequency of tourist visits, the findings presented in Zheng, Zha and Chua's (2012) study enrich tourism authorities and urban planners with practical insights into tourists' traffic transition and tourist routes re-development.

Despite having few instances, other intelligences with prominent managerial implications have been acquired and shared in some analyzed studies. For instance, Björk and Kauppinen-Räsänen (2012) find that functional risk related enquiries (e.g., risk for cancelation of the ferry traffic) are often raised in blog threads for Madrid in Spain whereas physical risk (e.g., risk of getting malaria) is the most frequently discussed risk category among blog threads for Cape Town in South Africa. Guided by concepts from positive psychology, Pearce (2012) reveals that content of travel narratives reflect both functional information and emotional reactions towards poverty in four Southern African countries. Liu, Law, Rong, Li and Hall (2013) apply the association rule mining approach to analyze reviews and ratings of 93 Melbourne-based hotels on *TripAdvisor.com*, and they successfully resolve the research question of "how customer expectations change with trip mode for groups of customers from the same background".

#### **4.2.2 What we don't know**

As shown in the above sub-sections, researchers are increasingly realizing that eWOM represent a rich vein of data that can help them exploit market intelligence, identify the areas in need of

improvement, and understand consumer experience with different forms of tourism (e.g., backpacking and wildlife tourism). While the question of “what senders describe in eWOM?” has been extensively researched and extensive knowledge has been derived, existing studies mostly analyze textual form of eWOM such as travel narratives (e.g., Goulding, Saren & Lindridge, 2013; Woodside, Cruickshank & Dehuang, 2007), travel blog posts (e.g., Leung, Law & Lee, 2011; Pearce, 2012), online review ratings (e.g., Jeong & Jeon, 2008; Stringam, Gerdes Jr & Vanleeuwen, 2010) and online review text (e.g., Dickinger & Mazanec, 2015; Xiang, Schwartz, Gerdes Jr & Uysal, 2015). The manifestation of consumer experience in visual and audio-visual forms of eWOM have seldom been analyzed. King, Racherla and Bush (2014) note that visual and audio-visual forms of eWOM is an emerging area of interest that has received limited attention. Considering the prevalence of recording and sharing audio-visual travel diaries via social media (e.g., YouTube.com and Vimeo.com) by travelers in general and young travelers in particular, the exploration of “what senders describe in visual or/and audio-visual eWOM?” is another issue that calls for research contribution.

To those researchers who plan to research the question of “what senders describe in eWOM?”, they are advised to conduct the research in the contexts of restaurant and attractions. Among those 79 studies investigating “what senders describe in eWOM?”, thirty-two (40.5%) and twenty (25.3%) are conducted in the context of hotel and destination, respectively. Although the database of most consumer review sites contains millions of reviews on restaurants and attractions, only six studies in this stream are conducted in the restaurant context (e.g., Mkono, 2013; Mkono, Markwell & Wilson, 2013; Pantelidis, 2010) and in the attraction context (e.g., Cong, Wu, Morrison, Shu & Wang, 2015; Guo, Sun, Schuckart & Law, 2016; Wu, Wall & Pearce, 2014). Considering the increasing body of eWOM available on consumer review sites and other portals, analyzing online restaurant (or attraction) reviews or eWOM is expected to help restaurateurs (or attraction managers) exploit marketing intelligence and thereby forging better restaurant (or attraction) management. Lastly, as mentioned earlier, more scholarly effort should be made to resolve the question of “when, where and how senders disseminate eWOM?” because this question has been rarely investigated in prior research. Through improving the knowledge about senders’ preferred portals and approach in disseminating eWOM, operators can then adapt the senders’ needs and improve the design of their review portals in order to solicit more contributors to share their insights and intelligence.

### **4.3 Senders’ consequences of eWOM contribution**

#### **4.3.1 What we know**

In contrast with another two quadrants in the same analysis unit, the influence of eWOM contribution on senders remains nebulous to date. Before year 2015, the article by Watson, Morgan

and Hemmington (2008) is one of the few which targets at understanding how a community of foodies creates meaning, understanding and identity through discussing their experiences on an Internet web log. In a case study of foodie blog named “Grab Your Fork”, Watson and colleagues (2008) claim that sharing restaurant experience or contributing knowledge about restaurants to the community is a manifestation of shared values and identity. Since other members from the community would derive added value from the knowledge or experience shared by contributors, the act of knowledge contribution gives additional meaning to consumption by contributors.

Though there is a woeful lack of research on “how eWOM contribution influence senders?” before 2015, a number of recent studies are published in order to address this gap in knowledge. Kim and Fesenmaier (2016) conduct two experiments in their paper in order to examine the interrelationship among the act of sharing tourism experience via social media, post-sharing emotional responses and post-trip evaluations. In sum, as compared to those who do not, travelers who share experience through social media are more likely to feel positive affect, which in turn leads to a more positive evaluation of their travel experiences. In another two studies by Schuckert and colleagues (Liu, Schuckert & Law, 2016; Schuckert, Liu & Law, 2016), the researchers report that reviewers with high-level badges are more cautious and less likely to give extreme ratings than those with low-level badges. Furthermore, review quality of reviewers with high-level badges decreases, and thus their reviews receive fewer helpful votes. These results denote that a reviewer’s upcoming review activity is potentially influenced by his/her duration of membership and former review contributions.

#### **4.3.2 What we don’t know**

It is widely acknowledged that tourism experience is constituted based upon a range of pre-trip activities (e.g., dreaming and collecting information for a future trip), on-site service encounters (e.g., greeted by a hotel receptionist) and post-trip activities (e.g., recalling and sharing the visitation experience with friends). Although sharing travel experience online is becoming more popular among travelers and that activity plays an important role in shaping tourism experience, it is surprising that the question of “how does eWOM contribution influence senders?” has been rarely explored.

Scholars in the psychology (e.g., Gross & John, 2003) and social science fields (e.g., Garnefeld, Helm & Eggert, 2011) have long advocated that reflecting past events can significantly influence one’s emotional and behavioral responses. Several researchers also test and verify that the act of sharing experiences can assist sharers in gaining emotional support and self-affirmation, relieving painful emotions, and lead to personal well-being (e.g., Pennebaker 1997). While Kim and Fesenmaier (2016) confirm and reveal that travelers who share eWOM on Facebook.com would lead to a more positive evaluation of their travel experience, their findings are not widely

generalizable because sharing eWOM with friends via social networking sites (e.g., Facebook.com) is not identical to sharing eWOM with strangers via consumer review sites (e.g., TripAdvisor.com). As such, one direction for future research is to examine if sharing eWOM on consumer review sites would influence traveler's emotion and evaluation of their travel experience. Besides, Ryu and Feick (2007) report that eWOM contribution can reinforce sender's post-evaluation satisfaction and loyalty towards the discussed brand. Since this notion has never been investigated in the tourism context, another direction for future research is to examine if sharing eWOM would influence traveler's satisfaction and loyalty towards the discussed brand.

## **4.4 Individual-level receivers' antecedents of eWOM consumption**

### **4.4.1 What we know**

Bronner and de Hoog (2011) once remark that research on motivations to read or seek eWOM are more extensively explored than those on motivations to write or provide eWOM. This statement could be proven true in 2011, but the current findings do not corroborate with their statement because fewer studies are found to primarily focus on Q4 (i.e., 11) than Q1 (i.e., 18). Table 8 lists all factors affecting individual-level receivers' eWOM consumption which are discussed in all studies addressing the questions of "what influence receiver' intention to consume eWOM" and/or "what motivate and demotivate receivers to consume eWOM". Alike Q1, MacInnis and Jaworski's (1989) MOA theory is utilized as the framework for classification. To recap, motivation refers to one's desire or readiness to engage in behaviors. Opportunity represents all situational factors that can enhance or impede the outcome, while ability is the extent to which consumers have the needed resources to achieve an outcome.

As shown in Table 8, all identified factors are motivation-related or opportunity-related. Surprisingly, no ability-related factor has been discussed in the analyzed literature. Four motives initiating receivers' eWOM consumption are discussed in the analyzed literature, and the most frequently discussed motive is risk reduction. Kim, Mattila and Baloglu (2011) note that risk reduction is one of the three chief motivating factors for Las Vegas travelers to seek eWOM. Hwang, Jani and Jeong (2013) content analyze posts requesting information on Lonely Planet, and report that nearly 40% of posts request information with the purpose of risk reduction. As stressed by researchers like Litvin, Goldsmith and Pan (2008), the experiential nature of tourism products and services make them difficult for consumers to assess their quality prior to their consumption. Due to the lack of pre-trial feature, prospective consumers rely on others' evaluations in order to alleviate financial and emotional risk. Besides minimizing risk, Kim, Mattila and Baloglu (2011) as well as Chen, Nguyen, Klaus and Wu (2015) note and confirm the significance of social reassurance in motivating prospective consumers to seek eWOM. Given that information from

previous customers provide prospective customers with vicarious access to prior service experience on which they can base their belief, eWOM shared by previous consumers provide a reliable basis upon which to make future purchase decisions.

Though eWOM are widely recognized as useful for travelers, several studies in this stream report that the decision of adopting or using eWOM is contingent upon how receivers perceive its content quality (e.g., Chen, Ngugen, Klaus & Wu, 2015; Filieri & McLeay, 2014). In a study with users of an online review platform about restaurants in Hong Kong and Macau, Cheung, Lee and Rabjohn (2008) describe that perceived relevance and comprehensiveness of information by receivers are key predictors of their perceived information usefulness. Receivers' perceived information usefulness may in turn positively and significantly affect their adoption intention. Adapting Petty and Cacioppo's (1986) elaboration likelihood model, the results in Filieri and McLeay's (2014) study also demonstrate that travelers' perceptions of information accuracy, information relevance, information timeliness are significant factors affecting their adoption of information from online reviews.

Apart from receiver's perceived content quality, trustworthiness and expertise of eWOM sender are also found to be of importance in determining receivers' judgements on information usefulness and adoption decision. According to a study with 456 Spanish-speaking members of online travel communities, Casaló, Flavián and Guinalú (2011) reveal that traveler's intention to follow the advice is positively affected by their level of trust placed in the community. Ayeh, Au and Law (2013a) later report similar findings in their study pertinent to user-generated content on TripAdvisor.com. Besides confirming the importance of reviewer trustworthiness, the researchers add that receivers' perceived expertise of reviewers has positive impact on their attitude towards using user-generated content for travel planning. In addition to the above, other content-related characteristics like content trustworthiness (e.g., Yoo & Gretzel, 2010) and source-related characteristics such as similarity with senders (e.g., Ayeh, Au & Law, 2013a; 2013b) have also been tested and verified by other literature in this stream. Furthermore, the moderating effect receiver' profile and personality on their motivation to consume eWOM are verified in the works by Casaló, Flavián and Guinalú (2011) as well as Yoo and Gretzel (2010).



**TABLE 8. FACTORS AFFECTING RECEIVERS' EWOM CONSUMPTION DISCUSSED IN ANALYZED LITERATURE**

<b>Factors</b>	<b>References<sup>a</sup></b>
<b>Motivation-related factor</b>	
<b>Receiver's motive to consume</b>	
Risk reduction	(4)(7)(9)
Social reassurance	(4)(9)
Convenience and quality	(4)
Knowledge enhancement	(7)
<b>Opportunity-related factor</b>	
<b>Situational factors affecting receiver's proneness to consume</b>	
Receiver's perceived information quality of eWOM content	(1)(7)(8)(9)
Receiver's perceived trustworthiness of eWOM sender	(3)(5)(6)
Receiver's perceived usefulness of eWOM content	(3)(6)
Receiver's perceived expertise of eWOM sender	(2)(5)
Receiver's perceived similarity with eWOM sender	(5)(6)
Receiver's perceived trustworthiness of eWOM content	(2)
Receiver's susceptibility to interpersonal influence	(3)
Receiver's perceived ease of use of eWOM content	(6)
Receiver's perceived enjoyment of eWOM consumption	(6)
<b>Receiver's profile and personality</b>	
Receiver's age	(2)
Receiver's personality	(2)
Receiver's travel frequency	(2)
<b>Ability-related factor</b>	
-	-

**Note:** <sup>a</sup> (1): Cheung, Lee & Rabjohn (2008); (2): Yoo & Gretzel (2010); (3): Casaló, Flavián & Guinalíu (2011); (4): Kim, Mattila & Baloglu (2011); (5): Ayeh, Au & Law (2013a); (6): Ayeh, Au & Law (2013b); (7): Hwang, Jani & Jeong (2013); (8): Filieri & McLeay (2014); (9): Chen, Ngugen, Klaus & Wu (2015).

#### 4.4.2 What we don't know

Alike the findings in Q1, extensive but uneven knowledge about receiver's antecedents of eWOM contribution are reported in previous studies. As shown in Table 8, all studies in this stream primarily purport to understand receiver's desire to engage in searching behaviors and other situational factors. By contrast, receiver's ability-related factors have never been explored. To redress this research void, more scholarly attention should be devoted to examine if and which receivers' ability-related factors (e.g., sender's knowledge about eWOM sources; sender's prior experience in using eWOM) may affect one's eWOM consumption intention. On the other hand, it appears that all studies about individual-level receivers' antecedents of eWOM contribution are based on responses from travelers or consumers residing in one country

or city (e.g., The United States in Yoo & Gretzel (2010); Spain in Casaló, Flavián & Guinalú (2011)). To explore the existence of difference in behavior or thought across consumers from different countries, future researchers may consider conducting cross-country studies. Lastly, as shown in Table 8, the list of identified opportunity-related factors is originated from various models or theories (e.g., Hovland, Janis and Kelley's (1953) source credibility model; Davis's (1989) Technology Acceptance Model). To improve the knowledge regarding the underlying mechanism of "what influences receivers' intention to consume eWOM?", future researchers are advised to propose an integrated model drawing on multiple theories and models.

## **4.5 Individual-level receivers' processing of eWOM consumption**

### **4.5.1 What we know**

Being the second most researched topical focus with 49 instances, issues pertinent to "processing of eWOM consumption" have been increasingly becoming scholars' prime interest since 2008. Similar to the distribution in Q2, very few studies primarily investigate "when, where and how receivers seek eWOM?". Gretzel, Kang and Lee's (2008) early paper reviews published references (e.g., market research reports) in order to outline national differences in adoption patterns of consumer-generated media by Internet users in China, Germany, the United Kingdom and the United States. Generally speaking, Internet users in Germany are less engaged in the use of consumer-generated media. Internet users in the United States are fond of reviews and consumer-generated videos while those in the United Kingdom focus on social networking applications. In an online survey with 12,544 Australian travelers, Cox, Burgess, Sellitto and Buultjens (2009) report that user-generated content is often used by travelers during the information search stage, particularly when accommodation option has not been chosen. Though over half of respondents would alter their decision due to the influence of user-generated content, only 28% of respondents in Cox, Burgess, Sellitto and Buultjens' (2009) study state they will change their existing travel plans due to user-generated content. Lee and Tussyadiah (2011) recently study information search and diffusion behavior by Korean nationals, and two interesting findings are reported. First, the Internet is the most efficient source for Koreans to retrieve information about destination for their potential travels. Second, text-photo combination is the most preferred form of eWOM and the most influential form of eWOM to provoke travel motivation of Korean travelers.

Similar to the depictions in Chaiken's (1980) heuristic-systematic theory of information processing as well as Kahneman's (2011) fast and slow thinking, studies in the realm of "what and how receivers analyze the received eWOM?" exhibit that receivers employ omnigenous heuristics and approaches to analyze received information. Even though topics discussed among those studies are diversified, based on the study subjects, they can generally be categorized into four

streams namely (1) receivers' selection and comprehension of eWOM, (2) receivers' analysis on credibility of received eWOM, (3) receivers' analysis on usefulness of received eWOM and (4) receivers' analysis on management response to eWOM.

#### **4.5.1.1 Receivers' selection and comprehension of eWOM**

To address the topic from the process perspective, some researchers explore the steps and criteria eWOM receivers use to select their consideration set of eWOM information (e.g., Herrero, San Martin & Hernandez, 2015; Ong, 2012). Williams, van der Wiele and van Iwaarden (2010) expose that hotel review users prefer reviewers' opinions to factual information (e.g., number of rooms). With reference to the in-depth interviews with five hotel review users, Williams and colleagues (2010) note that users often review multiple reviews in order to make informed decision. Also, details describing reviewers' travel profiles and belief are often scrutinized by readers because they can assist readers in interpreting how relevant for them the reviewers' opinions about the hotel are. Papathanassis and Knolle (2011) report contrasting results in their subsequent study. They note that online review users prefer structured reviews that focus on describing the facts and refrain from extensively narrating the feelings of the reviewer. Using the grounded theory approach to investigate how users perceive and utilize online reviews under realistic condition, Papathanassis and Knolle (2011) add that review user's perceived trustworthiness is influential since it may affect their degree of inclusion in the decision-making process.

Ong (2012) conducts an online survey purporting to ascertain six queries about perceived influence of online reviews in the hotel and restaurant industries. To help narrow down the choice, over 60% participants in Ong's (2012) study report greater use of written reviews than the aggregated numerical ratings. Ong (2012) also suggest that the minimum number of reviews on one hotel or restaurant for readers to consider the review reliable was around five to ten. Though eWOM is known as becoming more pervasive among travelers, contrasting results are still reported in several studies. Jacobsen and Munar's (2012) survey with Danish and Norwegian tourists reports that only 5% of the tourists found knowledge passed by social media to be vital for holiday aspects such as choices of accommodation, eating places, and activities. In another study with 616 Spanish members of an Internet community, Hernandez-Mendez and colleagues (2015) expose that destination/hotel websites are used more widely than travel blogs and social networking sites when Spanish travelers arrange their travel.

Besides exploring the way receivers select their consideration set of eWOM information, the matters of how receiver-related factors and eWOM-related factors influence receivers' comprehension of eWOM message has attracted some scholarly attention from researchers. Based on the responses provided by 398 Taiwanese travel blog users, Huang, Chou and Lin (2010) note that the extent of travel bloggers' involvement in ad messages positively influences their ad memory, ad attitude and brand attitude. In line with what involvement theory infers, travel

bloggers with high involvement in travel issues are more highly motivated to process the information on blogs, have favorable thoughts about ads, and are more likely to strengthen their purchase intention. The significance of information relevance and presentation format is highlighted in another two studies. Based on the concept of information relevance, Chen, Shang and Li's (2014) empirical study enriches the understanding of tourists' information search and destination choice behavior by including perceived relevance of travel blogs into the traditional paradigm of tourism decision-making. Applying the partial least squares structural equation modelling technique, the structural model in Chen, Shang and Li's (2014) study shows that perceived novelty, perceived interestingness and perceived understandability of content positively influences blog usage enjoyment, and this may in turn positively influences one's behavioral intention to visit a destination. Tussyadiah, Park and Fesenmaier (2011) demonstrate the efficacy of using tourists' stories to improve receivers' comprehension of the promoted message. Using stories posted on Pennsylvania Tourist Office website as the stimuli, the researchers find that readers' overall knowledge about the destination and their visit intention increase when they think the characters in the stories resemble themselves. The same effects are found when readers think the stories resemble their past positive experience.

#### **4.5.1.2 Receivers' analysis on credibility of received eWOM**

Different from traditional WOM, most of the cues that assist in the interpretation of one's opinions (e.g., acquaintance with the communicator and communicator's facial expression) are lacking in the online settings. Because the rules and approaches in assessing credibility of traditional WOM are not applicable to that of eWOM, a number of studies have been conducted to investigate how receivers resolve the difficulty in judging credibility or trustworthiness of eWOM (e.g., Dickinger, 2011; Park, Xiang, Josiam & Kim, 2014). In general, early research in this stream mainly examine if receivers' perceived credibility or trustworthiness of eWOM is comparable to that of traditional WOM. Being one of the pioneers who investigate this topic, Mack, Blose and Pan (2008) report that participants in their experimental study perceive traditional WOM to be significantly more credible and trustworthy than corporate blogs and personal blogs. Blog poster and non-posters are, however, found to share different thought about authoritativeness of blogs. To those who actively post blogs online, there was no significant difference in perceived authoritativeness of personal blogs, corporate blogs and traditional WOM. Yet, to those who do not actively post blogs, they perceive personal blogs to be less authoritative than traditional WOM and corporate blog. Dickinger (2011) later investigates if the dimensions of trustworthiness differ depending on the online channels. Harnessing the experimental design approach, Dickinger notice that content sharing on personal channel is perceived as more informative, reliable and sincere as opposed to those on marketing channel. The impact of search task is also highlighted in Dickinger's (2011) study. To be specific, integrity and ability of content on personal channel are slightly higher for the goal-oriented task than the experience-oriented task.

Recent research in this stream primarily focus on how content-related or source-related characteristics affect receivers' perception of eWOM credibility. Highlighting the impact of review valence and presence of reviewer's identity on travelers' perception of the credibility of the review and the development of initial trust to the travel-service provider, Kusumasondjaja, Shanka and Marchegiano's (2012) experimental study report that reviews with disclosed personal identity are rated as more credible from the receivers' viewpoint. The interaction effect between review valence and disclosure of reviewer identity on travelers' perception of review credibility is verified in their study. When source is identified, receivers perceive negative reviews as more credible than positive reviews. Park, Xiang, Josiam and Kim (2014) echo with Kusumasondjaja, Shanka and Marchegiano (2012) in their subsequent study, and they supplement that the perceived congruence between writer's personal profile information (e.g., travel interest) and the textual content of the review influences subjects' judgements of the reviewer's expertise. Nevertheless, the geographical closeness of the reviewer's location to the place described in the review does not correlate positively with an increase in the author's credibility. With the help of 336 staff members and students from two universities in the Republic of Ireland and England, the new research by Filieri (2015) successfully addresses the question of "why travelers trust consumer-generated media like TripAdvisor" and confirms that consumer trust towards consumer-generated media is dependent on three main antecedents. The structural model in his study shows that the strongest predictors of consumers' trust towards consumer-generated media are information quality, followed by customer satisfaction and website quality. Surprisingly, receiver's source credibility and prior experience do not exhibit a significant predictive power in their relationship with their trust towards consumer-generated media.

#### **4.5.1.3 Receivers' analysis on usefulness of received eWOM**

Defined as the diagnosticity or instrumental value of information embedded in eWOM for decision making (Mudambi & Schuff, 2010), the examination of eWOM usefulness or helpfulness has attracted much attention from scholars when eWOM accumulates. Indeed, the emergence of eWOM provides convenience to consumers to make informed decisions. But simultaneously, the abundance of eWOM makes users difficult to identify those that are helpful. To redress this, many researchers have attempted to identify key determinants influencing receiver's perceived usefulness of received eWOM. Content analysis is often used in early studies. Through reviewing 429 reviews of hotels in the United States on Yahoo! Travel, Black and Kelley (2009) reveal that readers would rate a review as more helpful if it includes five elements of a good story (i.e., including personal information; establishing a character; including more details; using non-superiority language; inspiring and well written). Using expectancy disconfirmation theory as the theoretical grounding, Zehrer, Crofts and Magnini (2011) content analyze online reviews on TripAdvisor.com and report that blog users tend to perceive congruent postings (i.e., a positive posting is followed by a positive posting). As compared to postings with negative incongruence

(i.e., a positive posting is followed by a negative posting), postings with positive incongruence (i.e., a negative posting is followed by a positive posting) are also found to be more useful from the reader's point of view.

Panel data analysis is increasingly adopted in recent studies due to the increasing body of eWOM and the advances in data extraction technique as time goes by. With the primary aim of profiling helpful reviewers in TripAdvisor.com, Lee, Law and Murphy (2011) review over 700 TripAdvisor members' profiles and show that review helpfulness is correlated positively with reviewers' expertise (i.e., number of destinations visited) and their review contribution (i.e., number of reviews contributed before). Their research result shows a negative correlation between average review rating and average review helpful rating, denoting that readers tend to perceive reviews with a low hotel rating as more helpful than reviews with a high hotel rating. Some latest works in this stream advance the theoretical implications by integrating content- and source-related characteristics in the analysis. Through analyzing reviews of local restaurants in London and New York on Yelp.com, Park and Nicolau (2015) state that people perceive negative reviews and longer reviews as more useful than positive reviews and shorter reviews. Regarding the impact of source-related characteristics, reviewer expertise and reviewer reputation are found to have positive impacts on review usefulness. Another study by Liu and Park (2015) report similar findings. They claim that the quantitative aspects of reviews, like star ratings and word count, positively influence the perceived usefulness of reviews. The qualitative aspect of reviews, like perceived enjoyment and readability, are also found to have positive influence on the perceived helpfulness of reviews. In accordance with Park and Nicolau (2015) as well as Liu and Park (2015), Fang, Ye, Kucukusta and Law (2016) find that reviews for attractions with extreme sentiment and higher level of readability generally have more helpful votes. Using the negative binomial and Tobit regression, Fang, Ye, Kucukusta and Law (2016) enrich the knowledge by reflecting that reviewers who stress the positive sides of the reviewed subject and have positive skewness (in terms of ratings) will receive more helpful votes.

#### **4.5.1.4 Receivers' analysis on management response to eWOM**

With more companies recognize the devastating impact of negative reviews on business performance and reputation, service providers are now active in interacting with reviewers and responding to their reviews in order to soothe dissatisfied consumers (or message senders) as well as to prevent potential consumers (or message readers) from patronizing competitors. Due to the significant theoretical and managerial implications of an effective service recovery strategy, several studies are conducted to better understand how receivers perceive and respond to management responses (e.g., Min, Lim & Magnini, 2015; Sparks, So & Bradley, 2016). In a study on consumers' attitudinal and behavioral responses to restaurant companies' reactions to criticism in social media, Xia (2013) notice that the act of admitting and apologizing is perceived as more

sincere and respectful to consumers than fending off the accusation. Responding to the criticism with vulnerability is found to be more appropriate from the customer's point of view, and this approach may enhance perceived sincerity of sophisticated brands more than it did for less sophisticated brands. Min, Lim and Magnini (2015) conjecture if empathy statement, problem paraphrasing and speed of response have significant effects in responding to online hotel reviews. With the help of 176 students at a mid-Atlantic university, their experimental study exhibits that management response containing an empathy statement will cause potential guests to evaluate the response more favorably than a response without an empathy statement. Paraphrasing a complaint in a response to a negative review will also cause potential guests to evaluate the response more favorably (than a response that does not paraphrase the complaint. While Min, Lim and Magnini (2016) reports there is no significant difference between the quick response group and slow response group in terms of satisfaction, Sparks, So and Bradley (2016) find the main effect for speed of respond on customer concern inferences. According to the results from their experimental study, they supplement that ratings of customer concern inferences are higher in the conversational human voice than in the professional voice condition. Moreover, ratings of customer trust inferences are higher in the conversational human voice than in the professional voice condition.

#### **4.5.2 What we don't know**

Ever since Mattila and Mount (2001) published one of the first works about Individual-level receivers' processing of eWOM consumption fourteen years ago, scholarly attention towards various issues about this topic has continued to grow. As noted in the beginning of sub-section 4.5.1, compared to the substantial effort paid to resolve the question of "what and how receivers analyze the received eWOM", existing knowledge about "when, where and how receivers seek eWOM" is largely scarce at the moment of this writing. Besides having more studies on the question of "when, where and how receivers seek eWOM", future researchers may consider conducting cross-country studies to examine the existence of national differences in terms of eWOM seeking behavior.

Regarding the question of "what and how receivers analyze the received eWOM", it is apparent that diversified topics have been investigated thoroughly. But still, there is some rooms for future research due to the inconclusive findings reported in previous studies. As shown in section 4.5.1.1, Williams, van der Wiele and van Iwaarden's (2010) report that hotel review users prefer opinion-based reviews while Papathanassis and Knolle (2011) describe that online review users in their study prefer fact-based reviews. Since contrasting findings are reported in prior studies and no subsequent study has attempt to investigate factors leading to this difference, this is a potential idea that academic researchers can explore in the future. Another direction for future

research is to examine if receivers perceive persuasiveness of reviews with mostly factual information and reviews with mostly reviewer's opinions differently. Ludwig and colleagues (2013) recently find that the existence of affective content in online reviews would influence viewers' attitude towards the reviews and their subsequent behavioral reactions. But given that Ludwig et al.'s (2013) study is conducted with reviews on tangible products (i.e., book reviews on Amazon.com), additional research is needed to examine if the same effect is applicable to reviews on intangible and hedonic products.

Pertinent to the topic about receivers' analysis on usefulness of received eWOM, as mentioned in section 4.5.1.3, all existing findings are generated based on secondary data using either content analysis (e.g., Zehrer, Crofts & Magnini, 2011) or panel data analysis (e.g., Liu & Park, 2015). It is not our intention to depreciate the value of findings derived from those analyses. However, from the methodological point of view, primary research using experiments or protocol analysis can serve as a supplement to reflect how review-related factors (e.g., reviewer profile) and other contextual factors (e.g., consumption goal) affect receiver's assessment on usefulness of received eWOM in the real-world setting. To those researchers who plan to investigate issues about receivers' analysis on usefulness of received eWOM, they are highly advised to consider conducting primary research.

## **4.6 Individual-level receivers' consequences of eWOM consumption**

### **4.6.1 What we do know**

Of those 38 identified articles exploring "how eWOM consumption influence receivers?", almost all studies focus on how receivers' pre-purchase evaluation is influenced by eWOM and/or its characteristics (e.g., volume and valence). A paucity of papers investigates the influence of eWOM on need recognition as well as other stages in the decision-making process. Given that various types of eWOM are discussed and their impacts on receivers vary differently, articles in this cluster are categorized based on the types of eWOM discussed in their corresponding studies. As such, three groups are formed and they are namely (1) Influence of consumer-generated blogs on receivers, (2) Influence of consumer-generated online photos and videos on receivers and (3) Influence of consumer-generated online reviews on receivers.

#### **4.6.1.1 Influence of consumer-generated blogs on receivers**

The impact of blogs on receivers is examined as early as year 2006. In an exploratory study on why "I left my heart in Aegean Sea" (i.e., the 2003 Yahoo Anniversary website) appealed to Taiwanese, Lin and Huang (2006) content analyze 301 messages left on that user-generated travel



blog. Besides describing four key success factors of that blog (i.e., current economic environment, mysterious identity of photographer, force of viral marketing and individual realization of dreams) and presenting suggestions in promoting Greek tourism to target customers, the content analysis results in Lin and Huang's (2006) show that over 45% of commentators exhibit aroused desire and elicited action after reviewing the blog. This reflects that stories and experiences sharing in consumer-generated blogs can enhance viewers' need recognition and induce their interest in searching for additional information about the described destination. Wang (2011) has also studied the impact of blogs on receivers, but he purposively focuses on the reasons why gastronomy blogs can influence blog readers' behavioral intention to taste local gastronomy. Using structural equation modeling to analyze the response from 329 readers of gastronomy blogs in Taiwan, the results exhibit that six out of seven antecedents have significant effects on readers' intention to taste local gastronomy (i.e., generating empathy; cybercommunity influence; experiencing appeal; providing image; presenting guides; social influences). Generating empathy is the strongest predictor amongst them, denoting that gastronomy blogs that can induce readers to generate intellectual identification with blog writers are more likely to encourage high intention to visit writer-described gastronomic locations.

#### **4.6.1.2 Influence of consumer-generated online photos and videos on receivers**

Though most media sharing sites (e.g., YouTube.com and Flickr.com) are introduced in mid-2000s, the first study examining how consumer-generated online photos and videos on receivers' attitudinal and behavioral reactions emerge in 2009. With the goal of examining the extent to which consumer-generated media mediates the tourist experience by enabling tourists to share their experiences with others, Tussyadiah and Fesenmaier's (2009) seminal paper harnesses netnography to analyze 120 consumer-generated videos about New York and 576 viewer comments on the videos. Alike stories sharing on travel blogs, online videos appear to induce prospective travelers' mental pleasures through imagination that bring to life people's dream and fantasies. On the other hand, the shared videos appear to trigger previous travelers' imaginations of re-experiencing the trip to the city.

Besides exploring how videos mediate tourist experience, influences of online videos on receivers' perceived destination brand and visitation intention are demonstrated in studies by Lim, Chung and Weaver (2013) as well as Hautz, Fuller, Hutter and Thurridl (2014). Lim, Chung and Weaver (2012) investigate and contrast the difference in consumer perceived destination brands created by consumer-generated videos and market-generated videos. Using the computer-based content analysis software to analyze comments on 107 consumer-generated videos and 91 marketer-generated videos about Las Vegas, the researchers conclude that consumer-generated videos generally attract more online users than marketer-generated videos in terms of views and comments. Consumer perception of a destination brand created by consumers is

found to be different from those created by marketers. Hautz, Fuller, Hutter and Thurridl's (2014) study explores the impact of video source (i.e., user-generated or agency-generated) and technical quality on spectators' belief of source credibility as well as their intention to visit the tourist destination. Using the 2 x 2 factorial design approach, the researchers describe that participants who are told that the video is generated by a user believed that the source is more trustworthy and have more expertise than those who are told it is generated by an agency. The multivariate analysis results add that respondents who felt that the source is relatively more trustworthy and have more expertise showed a higher level of intention to visit and willingness to share the video.

Being one of few studies that focus on online photos, Stylianon-Lambert (2012) research postcards of the attraction, images and comments Flickr and Picasa as well as videos recording at the attraction in order to investigate tourists' photographic representations and performances at the Rock of Aphrodite. One of the most interesting findings is that the orientation and view-point of postcards as well as online landscape photographs are very similar. This reflects that tourists consciously or unconsciously reproduce postcard images with their own photographs. Other than that, the author identifies that a kind of photographic etiquette seems to exist among tourists. The act of posing in front of a landmark seems to follow specific conventions and a demonstration of being there is also identified.

#### **4.6.1.3 Influence of consumer-generated online reviews on receivers**

Research effort on how consumer-generated online reviews affect receivers rockets since the late 2000s, and over two-third of those 39 studies in this cluster discuss the impact derived from online reviews. Early research mainly stresses on the impact derived from review exposure. Applying consideration set theory as the theoretical grounding, Vermeulen and Seegers (2009) conduct an experimental study to model the impact of online hotel reviews on consumer hotel consideration. With the inclusion of three review-related variables (i.e., review valence, reviewer expertise and review exposure), the researchers report that respondents' hotel awareness and hotel consideration significantly increases after being exposed to online reviews.

Given that exposure to an online review may prime the positive or negative aspect of the reviewed businesses, the examination of impact derived from review valence has also received much attention from scholars. Though it is inconclusive to conclude whether positivity bias (i.e., the impact of positive reviews on receivers' behavior is greater than that of negative reviews) or negativity bias (i.e., the impact of negative reviews on receivers' behavior is greater than that of positive reviews) is more prominent due to the existence of contrasting findings, the persuasive impact of positive reviews on customers' behavioral intention is consistently reported across various studies. Vermeulen and Seegers' (2009) experimental study shows that presenting positive review text to consumers yields a positive attitudinal change and has a positive impact on

respondents' hotel consideration. Mauri and Minazzi (2013) support and verify the impact of review valence on customers' purchase intention and service expectation. In their study, the average ratings of purchase intention and service expectation by respondents rises when the scenarios shift from prevalence of negative reviews to prevalence of positive reviews. Although the nature of reviews on review websites are not identical to those on general social media platforms (e.g., Facebook.com), Ladhari and Michand (2015) note that respondents exposed to positive feedback report higher levels of attitude, trust, website quality and booking intention toward the reviewed hotel, compared to those exposed to negative feedback.

Since consumers are likely to follow the major opinion of others as a result of pressure to conform to a peer group, several studies propose that the existence of a large number of reviews can lead consumers to rationalize their purchase decisions. Drawing on the responses from 269 business travelers in China, Zhao, Wang, Guo and Law (2015) study report that review volume has a positive impact on travelers' online booking intentions. Using hotel staying guests as the studied subjects, Tsao, Hsieh, Shih and Lin (2016) echo with Zhao, Wang, Guo and Law (2015) and supplement that positive review can induce greater booking intention than negative reviews, and the influence of review valence on booking intention is strengthened with a greater number of reviews. In recent years, the impact of review conformity or consensus has attracted increasing level of attention by researchers (e.g., Book, Tanford, Montgomery & Love, 2015; Lee & Cranage, 2014). With the special focus of opinion consensus, Lee and Cranage (2014) design an offline experiment to examine the impact of "level of negative eWOM opinion consensus" on consumers' attributional process and attitude change. The results show that potential consumers in the high negative eWOM condition exhibit greater attitude changes in a negative direction than their counterparts in the low consensus condition. Using the scenario of having a Spring break vacation in Cancun (Mexico), Tanford and Montgomery's (2014) experimental study notes that subjects were significantly less likely to choose a green resort when a minority of reviews favored that resort. Also, subjects report greater dissonance when the influence was a minority versus majority. In line with their previous study, Book, Tanford, Montgomery and Love (2015) later confirm that review conformity has a strong effect on resort evaluations and post-decision dissonance. Specifically, subjects in the non-unanimous condition who chose the alternative resort felt more dissonance than those who chose the base resort.

Apart from the above three dominant characteristics (i.e., review valence, review volume and review conformity), the influences of other review-related characteristics such as review framing (e.g., Sparks & Browning), review target (e.g., Browning, So & Sparks, 2013), review congruence (e.g., Jin & Phua, 2015) are investigated in prior studies. The impact of reviewer- or source-related characteristic are also examined by previous researchers. The exhaustive list of characteristics include, but not limited to, incidental similarity (e.g., Zhang, 2015), reviewer expertise (e.g., Vermeulen & Seegers, 2009), presence of personal identifying information (e.g., Xie, Miao, Kuo & Lee, 2011) and others.

#### **4.6.2 What we don't know**

Drawing on the findings reported in those 39 articles exploring “how eWOM consumption influence receivers?”, it is well established that eWOM significantly affects consumers’ decision-making. But as noted earlier, most published works focus on how receivers’ pre-purchase evaluation is influenced by eWOM while knowledge about how eWOM influences need recognition and other stages other stages of the decision-making process is rarely explored. This implies that the questions like “which form of eWOM can most effectively trigger receivers’ travel motivation”, “will the exposure of eWOM (after completing the service consumption process) create dissonance and influence consumer loyalty”, “will the received eWOM influence receivers’ future eWOM” are ripe for investigation in the coming future.

### **4.7 Firm-level receivers’ antecedents of eWOM consumption**

#### **4.7.1 What we know**

Though the influence of eWOM for hotels and other tourism businesses has been widely acknowledged by industry practitioners and many companies are already putting the mechanisms in place to monitor, it is surprising that only Pühringer and Taylor (2008) have explored “what motivate and demotivate operators to consume eWOM?” over the past 15 years. In their practitioner paper examining Kitzbühel tourism operator’s online strategies and their level of awareness about blogs, Pühringer and Taylor (2008) conduct a survey with tourist accommodations operators in Kitzbühel and questions about why they embrace blogs are asked in the questionnaire. Based on the completed responses by 78 operators, less than one fourth of them have looked at a tourist blog or read an online forum while businesses are more likely to be aware of or used blogs if they have a consumer website or embrace eCommerce. Regarding the reasons operators use blogs, the most prominent reason reported is to monitor what was said about their business since it is selected by around 80% of respondents. Almost 40% of operators who use blogs mention that they use blogs to monitor what is being said about the destination of Kitzbühel, and one third of operators employ it to monitor what is said about their competitors.

#### **4.7.2 What we don't know**

eWOM has long been recognized as a form of interpersonal influence that has a significant impact on customers’ buying behavior. Considering that eWOM are honest sharing of genuine opinions and information about products and services among consumers, numerous academic and industry research has proven that savvy operators in the field now actively harvest eWOM for monitoring company reputation or image, discovering what consumers say good and bad

about their experience, as well as correcting errors in their service and product (O'Connor, 2010; Revinate, 2017; Stringam & Gerdes, 2010). While harvesting and analyzing eWOM for extracting market intelligence is increasingly becoming an industry norm, it is surprising that the questions of "what motivate and demotivate tourism and hospitality operators to consume eWOM" as well as "what influences firms' intention to consume eWOM" has remained under-investigated in academic research. Tornatzky and Fleischer (1990) suggest that a firm's adoption and use of innovation is influenced by various innovation-related factors (e.g., relative advantage), organization-related factors (e.g., technological readiness) and environment-related factors (e.g., perceived pressure from industry or partners). Considering the dearth of research in this area, future research may consider applying Tornatzky and Fleischer's (1990) framework to supplement Pühringer and Taylor's (2008) work in improving the knowledge about "what motivate and demotivate tourism and hospitality operators to consume eWOM".

## **4.8 Firm-level receivers' processing of eWOM consumption**

### **4.8.1 What we know**

Though the retrieval and analysis of eWOM is gradually becoming a conventional practice among practitioners, the question of "what and how firms analyze the received eWOM?" has only been explored in two studies over the past 15 years. Park and Allen (2013) is one of those two studies which examine the process through which high-end hotels manage online review responses and the underlying reasons for their choices. With reference to their comparative case study of four high-end hotels in the Western United States, they note that the analyzed hotels do not have a standard way of responding to online reviews. Regular responders employ collaborative style of internal communication since they hold regular meetings and discussions as issues arose, while infrequent responders do not hold regular meetings about online review issues. Despite the difference in communication style, two general approaches to utilize online review information are often used. The first one is problem solving approach, which suggests that operators see online reviews as a mechanism for resolving customer complaints as quickly, efficiently and discreetly as possible. The second one is strategic approach, which suggests that operators use online review information to improve operational efficiency and even create innovative service offerings.

Torres, Adler, Behnke, Miao and Lehto (2015) also attempt to examine the extent to which hotel managers use consumer-generated feedback systematically to make changes in operating procedures. Based on the survey responses provided by general managers of 140 four- and five-diamond properties in the United States, general managers in the United States are found to monitor consumer-generated feedback on a daily basis. While general managers agree that con-

sumer-generated feedback change their practices of “resolving the problem at hand” and “identify patterns of complaints”, they place greater value on personal forms (i.e., in-person complaints) rather than electronic ones (i.e., reviews on travel websites). Additional analyses in Torres and colleagues’ (2015) also exhibit that more time spent in monitoring positive feedback is positively related to improvement in perceived quality.

#### **4.8.2 What we don’t know**

In a guest article by Michelle Wohl, Vice President of Marketing at Revinat, she claims that savvy hoteliers have been increasingly embracing a proactive approach to review consumer-generated reviews, turn sentiment information contained in reviews into key performance indicators, and optimize their operation (Wohl, 2013). Indeed, thanks to the advent of many online review consulting firms (e.g., Revinat, ReviewPro) and the advances in online reputation management tools (e.g., RT Review, TrustYou Analytics), tourism and hospitality operators are now having stronger capabilities in analyzing voluminous eWOM and exploiting customer intelligence from them.

Findings reported in Park and Allen’s (2013) as well as Torres and colleagues’ (2015) studies undoubtedly provide initial insights about how hoteliers analyze the received eWOM available in the online space. But since the subjects of both studies are hotels in the United States, additional research effort should be paid to explore how operators in other countries or tourism sectors (e.g., restaurateurs and destination management organizations) process and leverage intelligence from received eWOM. In addition, given that many operators now outsource the review analysis task to consulting firms, the examination of metrics (e.g., average ratings, sentiment of review text) included in the regular reports and which metrics are associated with their business’s financial performance is expected to generate new knowledge with substantial practical implications to practitioners. In recent years, both practitioners and researchers are increasingly aware of malicious online behavior such as deceptive online reviews and fake online profiles (Luca & Zervas, 2016). With fraudulent eWOM being rampant on travel review sites as well, the examination of how tourism operators detect and handle fraudulent eWOM is expected to provide substantial insights to both academic researchers and industry practitioners.

### **4.9 Firm-level receivers’ consequences of eWOM consumption**

#### **4.9.1 What we know**

Compared to the scholarly attention paid to Q7 and Q8, it is apparent that contributors of the previous works are more interested in the examination of “how eWOM consumption influence

operators” and “how operators respond after eWOM consumption”. Among those works focusing on the impact of eWOM on operators, early studies are mainly general discussions and do not target particular form of eWOM. To acquire insights about the proliferation of social software (including blogs, wikis and consumer review sites) and its consequences for the hotel industry, Dwivedi, Shibu and Venkatesh (2007) analyze published literature and online reviews for two Indian and European hotels. The researchers observe and report that hotels have been losing control over what gets written about them online with proliferation of social software. Due to the fast emerging medium of information sharing, the researchers conclude by advising hotel operators to be aware of the trend and have sound strategies in place in order to convert consumer-generated content into business intelligence. Hills and Cairncross (2011) interview eight providers of small accommodations in the Coffs Coast (New South Wales), and they notice that managers perceive and respond to user-generated websites in considerably different ways. On one hand, managers agreed that user-generated content websites provide an important avenue for zero-cost market research and zero-cost marketing for their companies. On the other hand, managers acknowledge that the divergence of content contributions is a threat to their businesses because the content shared by either very satisfied or very dissatisfied consumers may formulate unrealistic expectations and disappointment to future consumers.

Recent studies in this stream primarily examine the economic impact of eWOM on discussed businesses’ financial performance. Except Lu, Ba, Huang and Feng (2013), all studies focus on the economic impact of online hotel reviews. Through analyzing reviews on 248 Chinese hotels published Ctrip.com, Ye, Law and Gu (2009) report that a 10% improvement in reviewers’ average rating of reviews (on the first two pages) can increase sales by 4.4%. Ye, Law, Gu and Chen (2011) conduct a similar study two years later, and they also find that a 10% improvement in average rating of online user reviews on Ctrip.com increases the index of room sales by more than 5%. Harnessing the same approach used by Ye, Law and Gu (2009) and using number of online reviews as a proxy for hotel’s sales performance, Ogut and Onur Taş (2012) report that 1% increase in average customer ratings on Booking.com increases sales per room up to 2.68% for hotels in Paris and 2.62% for hotels in London.

In spite of the significant theoretical and managerial implications derived from the above three studies, the validity of using number of online reviews as a proxy for hotel’s sales performance has received many criticisms (e.g., Torres, Singh & Robertson-Ring, 2015). To redress this limitation, one part of subsequent studies alters to utilize the sales figures provided by third-party organizations as a proxy for hotel’s sales performance. Duverger (2013) investigates how review length, review ratings, review volume and others affect hotels’ revenue per available room through analyzing a longitudinal panel data provided by Smith Travel Research and online travel agencies (e.g., TripAdvisor, Orbitz and Expedia). Their study does not only show that review ratings have a curvilinear relationship with hotel’s RevPAR, but also exhibit that overall review valence and review length was found to have negative impact on hotels’ RevPAR. Phillips, Zigan,

Silva and Schegg (2015) use an artificial neural network model to investigate the relationships among online hotel reviews, hotel characteristics and hotel performance. Drawing on the review-related data provided by TrustYou and performance-related data provided by Swiss Federal Statistical Office, the resulting neural network typology reveals that percentage of positive reviews and number of reviews have significant contribution to financial performance of Swiss hotels. Torres, Singh and Robertson-Ring (2015) utilize financial data from TravelClick and review data from TripAdvisor to test the relationships among review ratings, hotel ranking, review volume and financial outcomes of 178 hotels residing in the United States. The relationship between a customer rating and average value of online transaction is found to be positive, and specifically, each TripAdvisor star equates to an incremental USD280 per booking transaction. Yet, different from what researchers postulate, the hotel's ranking on TripAdvisor is not significantly related to the average value per online transaction. Xie, Chan and Wu (2016) recently address a void in literature and empirically examine the effects of online reviews on offline hotel occupancy. Based on the hotel occupancy records by Trepp and review data from TripAdvisor, the result shows that the popularity of hotels become higher when the average review rating and the number of customer reviews is higher. The authors also find that the effect of review rating carries over to at least a couple of quarters, but the effect of review volume decays quickly in the next quarter.

Besides relying on the figures from third-party organizations, another part of subsequent studies utilizes the financial figures from the reviewed companies to examine the causal relationship between reviews and business performance. With the support of an international hotel chain company, Kim, Lim and Brymer (2015) attempt to explore the effect of online reviews and other information related to online reviews on hotel performance. Using both average daily rate (ADR) and revenue per available room (RevPAR) as the proxies of hotel sales performance, the results show that customer ratings post on social media have the most significant impact on ADR and RevPAR. Percentage of response to negative comments is also found to have positive impact of ADR and RevPAR, but review volume, variance of overall ratings and the diamond rating do not have significant impacts on ADR as well as RevPAR.

Pertinent to the content discussed in studies exploring "how operators respond after eWOM consumption?", similarly, early papers are dominantly general discussions on why monitoring eWOM and responding to negative eWOM is such crucial to tourism and hospitality operators. Tyrrell and Woods (2004) review service recovery literature and revisit four concepts (i.e., affect balance theory, equity theory, attribution theory as well as the degree of customer voice/no-voice) with the purpose of assisting industry practitioners in understanding the role of service recovery in customer satisfaction and intention to complain. Besides discussing the types of service recovery approaches or strategies operators can choose, the researchers remind practitioners that different levels of service recovery are needed depending on problem severity, criticality, how prior attempt to fix are evaluated as well as compensation by company. Akehurst (2009)



explores the development of user-generated content and specifically the increasing use of blogs in travel and tourism. Drawing on a comprehensive review of literature, the researcher acknowledges the potential of user-generated content in offering tourism organizations valuable market intelligence and remind tourism organizations not to ignore the development of user-generated content. However, considering the sheer number of travel blogs, sourcing, extracting and analyzing blog content will become a bigger challenge to destination marketers. Hence, the author concludes his article by advising tourism organizations to harness artificial intelligence to extract useful information from blog content or develop a blog visualization system. Using *mystarbucksidea.com* as a case study, Sigala's (2012) study demonstrates that customers can generate new service ideas and make suggestions for service improvement through reflecting on their own situation in the form of online dialogues. To effectively manage customers' idea contribution as well as to enhance businesses ideation new service development process. Sigala (2012) offers three suggestions. These include guiding and triggering customers to identify their needs and problems, encouraging customers to think outside their normal role because the variety of role makes them to experience varied situations from which in turn they can identify various latent needs, as well as having heterogeneous customers to present and having staff's intervention in place are another two suggestions.

Considering the growing volume of negative eWOM on different channels and the possible negative consequences for organizations, a number of researchers analyze responses provided by hotel or tourism operators in order to find effective strategies for responding to negative online reviews. Sparks and Bradley (2017) develop a typology of how firms respond consumer-generated online reviews based on in-depth interviews with eight hotel managers and analysis of 150 management responses to negative reviews. In general, the responses offered by the discussed hotels are professional, friendly and non-defensive. Regarding the response speed, most of the hotel responses are issued between one and three days after the customer review was posted. The most common acknowledgment category is to thank the reviewer for providing the review (33%), and a sizeable proportion of responses acknowledge that the event occurred (25%). Many responses (34%) do not include any type of account for the matter raised in the online review. Among those responses that did include an account, the most common type was a justification. Most conversations (35%) do not specify action at all. When the manager did specify a form of action, the most frequent response was to indicate that the matter had been referred to the relevant area.

Zhang and Vásquez (2014) investigate the generic structure of hotel responses to customer complaints posted on *TripAdvisor.com*. By means of reviewing 80 management responses by four Chinese hotels on *TripAdvisor.com*, ten distinct moves are found in hotel responses to negative reviews. "Express gratitude for the stay and for the feedback" was the most frequent move, and followed by "apologize for sources of trouble" and "invitation for a second visit". Zhang and Vásquez (2014) also notice there is a typical sequence of moves but it is a fairly formulaic one.

To examine New York City hotels' responses on the social media site TripAdvisor regarding bed bug crisis issues, Liu, Kim and Pennington-Gray (2015) analyze the 176 management responses on all reviews about bed bug crisis on TripAdvisor.com between 2002 and 2013. The content analysis results reveal that more than one third (37.5%) of the sample responses provide factual information of bed bug infestations in the way of stating the industry's protocol and/or the pest control policy of the hotel. Regarding the solution hotels use to help guests cope with the crisis psychologically, about one quarter (23.3%) of the responses display a sympathetic attitude and some (31.8%) explicate the actions they took to correct the problem. To help hotels manage their reputations, about half of the responses (49.4%) use the strategy of reminding and over 40% (43.2%) of them use the strategy of ingratiation. Over one third (34.1%) of the responses provide follow-up information in the last part of their description.

#### **4.9.2 What we don't know**

With reference to the synthesis of articles classified in this stream, it is clear that the economic impact of eWOM on businesses' financial performance has reached an unprecedented level. But except Lu, Ba, Huang and Feng (2013), all published works focus on hotels whereas little attention has been paid to restaurants, attractions and other tourism sectors. This denotes that knowledge about "how eWOM influences restaurants' financial performance" and "how eWOM affects attractions' visitor volume or/and revenue" are still unclear. Ladhari and Michaud (2015) acknowledge and criticize the impact derived from eWOM posted on general social networking sites like Facebook has been largely overlooked by academic researchers. Since existing studies in this stream have already confirmed the economic impact of eWOM on consumer review sites (e.g., reviews on TripAdvisor.com, Ctrip.com and Booking.com), it will be interesting to examine whether eWOM on social networking sites (e.g., posts on Facebook.com and tweets on Twitter.com) generate the same or differential impact on tourism businesses' financial performance.

To the question of "how operators respond after eWOM consumption", knowledge about how industry practitioners respond to negative eWOM in general and negative reviews in particular has been discussed in the analyzed literature (e.g., Sparks & Bradley, 2017; Zhang & Vásquez, 2014). The optimal way to enhance consumers' propensity to contribute eWOM has been under-researched. Picazo-Vela, Chou, Melcher and Pearson (2010) describe that perceived pressure is one reason leading consumers to generate eWOM. As the high volume of reviews indicates popularity of the discussed business and give prospective customers sufficient information for purchase decisions (Nguyen & Coudounaris, 2015), additional research effort shall be made to assess the efficacy of various initiatives (e.g., economic incentives and follow-up invitations) in motivating one's perceived pressure and intention to contribute eWOM.

## 5 CONCLUSIONS AND LIMITATIONS

The advent and prevalence of social media undoubtedly provides a momentum for the accelerated growth in creation and popularity of eWOM, since consumers are now empowered to share their experiences and opinions online in the form of text, photographs and videos via consumer review sites, social networking sites, media sharing sites and others (Leung, Law, van Hoof & Buhalis, 2013; Xiang & Gretzel, 2010). Considering the exponential growth of eWOM in both volume and significance, eWOM in tourism and hospitality becomes an emerging topic which has received increasing scholarly attention by scholars and practitioners in the field. Harnessing the systematic review approach to identify and synthesize the findings discussed in 195 eWOM-related articles in academic journals, this study serves as an important supplement to Cantalops and Salvi's (2014) as well as Chen and Law's (2016) works by unveiling the state of research on eWOM in tourism and hospitality between 2001 and 2015. Considering the growing number of articles on the topic published in academic journals (see Figure 1), the significance and attention of eWOM in tourism and hospitality has proven to be growing over the past 15 years. The inclusion of tourism-related eWOM research in the diversity of journal outlets also reflects the increasing attention being paid to this topic is not limited to scholars in the tourism-related academic community.

From the theoretical perspective, this study contributes to the literature by synthesizing the research inquiries that have been discussed in extant literature. Compared to other literature review studies on the same topic (see Table 2), the comprehensiveness and timeliness of the current study are deemed to be the highest since an unprecedentedly high number (i.e., 195) of articles about eWOM- (but not online review related-) articles published up to 2015 were reviewed. Besides, this study excel those extant literature review studies by applying a structural and scientific approach in literature search and synthesis. Drawing on a nine-quadrant (i.e., 3 levels of unit of analysis x 3 levels of focus of analysis) framework adapted from previous research, this study addresses the questions of "what we know" and "what we don't know" about eWOM in tourism and hospitality in their entirety.

In terms of unit of analysis, Sections 3 and 4 exhibit that diversified topics or issues on eWOM in tourism and hospitality have been investigated over the past 15 years but scholarly attention is unevenly distributed. Most of the analyzed studies focus on issues at the individual talker level and individual listener level, while research effort on issues pertinent to firm-level receivers are comparatively scarce. The author acknowledges the challenges of researching corporate listener related issues (e.g., refusal to share data due to the fear of leaking commercial secrets). But researchers are highly encouraged to produce more research on firm-level issues given that the findings and insights will be of value for practitioners in improving their eWOM-related practices and achieve business well-being. In addition to the unit of analysis, uneven intensity of research effort paid to each research focus is also observed from the analysis (see Tables 5 and 6). Issues

pertinent to senders' processing of eWOM contribution (i.e., Q2), individual-level receivers' processing of eWOM consumption (i.e., Q5) and individual-level receivers' consequences of eWOM consumption (i.e., Q6) have been researched extensively. Research on firm-level receivers' antecedents and processing of eWOM consumption (i.e., Q7 and Q8) are however in its infancy. Though diversified topics have been investigated over the past few years, some research voids in existing studies can still be identified (see Table 9). The development of an agenda for future research is therefore another contribution of this study, enabling readers to understand "what we don't know about eWOM in tourism and hospitality" from research. The author envisions that findings reported in those future studies will contribute more knowledge or insights to the stream of eWOM research.

From the methodological perspective, this study demonstrates that a systematic review can be of great scientific value because they can effectively identify consistencies, contradictions and gaps in previous research findings. To those researchers who plan to synthesize findings and discussions pertinent to a mature topic of academic inquiry, the procedures described in the current study may offer a helpful reference for them to follow. From the practical perspective, the distillation of knowledge synthesized in this study is expected to extend industry practitioners' knowledge about what market intelligence can be extracted from eWOM (from section 4.2.1.4), how receivers perceive management response to negative reviews (from section 4.5.1.4), the economic impact of eWOM on discussed businesses' financial performance (from section 4.9.1) and others. Practitioners may also harness the intelligence learnt to develop adequate strategies and better leverage the benefits derived from eWOM to improve business outcomes.

While this study presents a modest effort to synthesize research on eWOM in tourism and hospitality, limitations in association with this study are however inevitable. A major limitation of this study is the inclusion of English-language full-length articles published in referred academic journals only. Publications in the forms of book chapters as well as research articles from conference proceedings, particularly the proceedings of the annual ENTER conferences, were not included. On the other hand, given that the organizing framework applied in this study is conceptualized from a communication-based perspective, the application of this framework might constrain the flexibility of data analysis and limits the possibility of identifying other potential research directions from other perspectives. To redress these voids, future research may enhance the breadth of review by including publications in all forms and sources for gaining more insights about "what we know" and "what we don't know" about eWOM in tourism and hospitality. Moreover, future research may integrate the quantitative content analysis approach to reflect methodological, sectoral and authorship trends of eWOM research. This will provide readers with a clearer intellectual territory of eWOM research. Due to the exponential growth of eWOM in both impact and size, the author envisions that the area of research on eWOM in tourism and hospitality will be growing, subsequent researchers may consider replicating the

current study after a certain time period. Applying the organizing framework proposed in the current study (i.e., Table 3), the results of the suggested study is expected to reveal the change in research intensity across different research foci and thereby reflecting the progression and development of knowledge on this stream of research.

TABLE 9. LIST OF RESEARCH DIRECTIONS / UNANSWERED QUESTIONS BY FOCUS OF ANALYSIS

Focus of analysis	Research directions / Unanswered questions
Q1: Senders' antecedents of eWOM contribution	<ul style="list-style-type: none"> <li>• Impact of ability-related factors on sender's eWOM contribution intention</li> <li>• Relative weight of motives leading senders to generate eWOM</li> <li>• Factors affecting sender's eWOM contribution in the airline/attraction contexts</li> </ul>
Q2: Senders' processing of eWOM contribution	<ul style="list-style-type: none"> <li>• When, where and how senders disseminate eWOM</li> <li>• What senders describe in visual or/and audio-visual eWOM?</li> <li>• Representation of experience/image in restaurant (or attraction) reviews</li> </ul>
Q3: Senders' consequences of eWOM contribution	<ul style="list-style-type: none"> <li>• Influence of sharing eWOM on consumer review sites on traveler's emotion and evaluation of their travel experience</li> <li>• Influence of sharing eWOM on traveler's satisfaction and loyalty towards the discussed brand</li> </ul>
Q4: Individual-level receivers' antecedents of eWOM consumption	<ul style="list-style-type: none"> <li>• Impact of ability-related factors on receiver's eWOM consumption intention</li> <li>• A cross-country study on receiver's antecedents of eWOM contribution</li> </ul>
Q5: Individual-level receivers' processing of eWOM consumption	<ul style="list-style-type: none"> <li>• When, where and how receivers seek eWOM?</li> <li>• Receiver's perceive persuasiveness of opinion-based and fact-based reviews</li> <li>• Receiver's analysis on usefulness of eWOM: An experimental study</li> </ul>
Q6: Individual-level receivers' consequences of eWOM consumption	<ul style="list-style-type: none"> <li>• Which form of eWOM can most effectively trigger receivers' travel motivation?</li> <li>• Will the received eWOM influence receivers' future eWOM?</li> <li>• Will the exposure of eWOM (after the service consumption) trigger dissonance and influence consumer's loyalty?</li> </ul>
Q7: Firm-level receivers' antecedents of eWOM consumption	<ul style="list-style-type: none"> <li>• What motivate and demotivate tourism operators to consume eWOM?</li> <li>• What influences firms' intention to consume eWOM</li> </ul>
Q8: Firm-level receivers' processing of eWOM consumption	<ul style="list-style-type: none"> <li>• How operators in non-hotel sectors process and leverage intelligence from received eWOM?</li> <li>• How tourism operators detect and handle fraudulent eWOM</li> </ul>
Q9: Firm-level receivers' consequences of eWOM consumption	<ul style="list-style-type: none"> <li>• Impact of eWOM on attractions' visitor volume or/and financial performance</li> <li>• Differential effects of initiatives in motivating consumer's perceived pressure to contribute eWOM</li> </ul>

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## APPENDIX

### Appendix I. List of analyzed literature in this study

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## **STUDY 2: WHAT MAKES A USEFUL ONLINE HOTEL REVIEW? EXAMINING THE INFLUENCE OF REVIEW CONTENT, REVIEW STYLE AND REVIEW SOURCE**

### **Abstract**

The emergence of online reviews undoubtedly helps consumers solve a challenge of having little data for assessing quality of intangible products like hotel accommodation and other travel services. However, the abundance of online reviews make consumers become harder to identify useful reviews with high diagnostic value. Considering that online reviews are one type of social communications working within a framework of “who says what in which form with what effect on the audience”, the primary objective of this study is to examine the main and interactive impact of review content, review style and review source on receivers’ perceived review usefulness. Harnessing negative binomial regression to analyze over 1,900 online reviews on hotels in five European cities which were published on TripAdvisor.com, the empirical findings of this study exhibit that review depth, presence of photo, review readability and reviewer reputation have a positive impact on review usefulness. The impact of review breadth and reviewer expertise on review usefulness are negative, while readers’ perceived review usefulness is not influenced by photo volume, document-level and sentence-level linguistic style. Being one of the first studies attempting to combine content-, style- and source-related characteristics into one model for predicting receivers’ perceived usefulness of online hotel reviews, this study does not only contribute new knowledge to the growing stream of research on online reviews but also provide hoteliers with practical clues about online review management.

### **Keywords**

Online reviews; review helpfulness; review content; review style; review source; negative binomial regression.

## 1 INTRODUCTION

As an evolving form of interpersonal influence in the computer-mediated realm, eWOM in general and online reviews in particular have been increasingly embraced by consumers to inform their purchase decisions. Pew Research Center recently report that 82% of adults in the United States sometimes or always read online customer ratings or reviews before purchasing items for the first time (Smith & Anderson, 2016). The latest report by Barclays (2016) also exhibits that consumers in the United Kingdom pay much attention to online reviews when choosing cinemas, salons, boutiques and even sports clubs. The fields of tourism and hospitality are not immune, given the fact that most travelers collect online reviews early in the travel decision making process in order to minimize the risk of making a poor decision (Kim, Mattila & Baloglu, 2011). Since hotel accommodations and other tourism services are experiential and intangible in nature, numerous industry reports reveal that global travelers are increasingly making a purchase decision based on reviews and recommendations by past customers, and online reviews gradually become one of the most important factors considered by leisure travelers looking for accommodations (PhoCusWright, 2013; ReviewTrackers, 2016).

To consumers, the emergence of online reviews undoubtedly helps them solve a long-lasting challenge of having little data for assessing quality and making informed decisions. The abundance of online reviews, however, introduces a new challenge to consumers because they are now becoming harder to identify useful or helpful reviews. To identify reviews with high diagnostic value for consumers in making better purchase decision, review usefulness has been increasingly becoming scholars' prime interest and a plethora of researchers have examined determinants influencing receivers' perceived usefulness of online reviews (e.g., Huang, Chen, Yen & Tran, 2015; Li, Huang, Tan & Wei, 2013; Mudambi & Schuff, 2010; Pan & Zhang, 2011; Sen & Lerman, 2007). In light of the exponential growth of tourism-related online reviews in both volume and significance, adding that findings from reviews for physical goods may not be generalized or applicable to reviews for experience goods, many scholars have endeavored to examine factors influencing perceived usefulness of travel-related online reviews.

Though significant findings and insightful discussions are reported, extant studies mostly focus on online attraction reviews or online restaurant reviews (e.g., Fang, Ye, Kucukusta & Law, 2016; Liu & Park, 2015; Racherla & Friske, 2012; Salehi-Esfahani, Ravichandran, Israeli & Bolden, 2016). Even though a significant proportion of reviews available on consumer review sites and online travel agencies' websites are pertinent to hotel accommodations (e.g., 28% of reviews and opinions about Vienna on TripAdvisor.com are related to hotels), scholarly attention towards determinants affecting perceived usefulness of online hotel reviews is rather limited. As reported in Ong's (2012) study, the attributes that hotel review readers pay attention to are drastically different from those restaurant review readers do. Racherla and Friske (2012) share the same notion, and they empirically verify that receiver's assessment on review usefulness varies across

different service contexts. As previous findings from restaurant and attraction reviews may not be generalized into hotel reviews due to the variations in contexts, it is of urgency and necessity to understand the idiosyncratic set of factors affecting perceived usefulness of online hotel reviews.

Besides the dearth of research on online hotel reviews, existing studies mostly stress the significance of content-related (e.g., review elaborateness and review rating) and source-related characteristics (e.g., identity disclosure and reviewer expertise). By contrast, little attention has been devoted to the impact of review style on receivers' assessment of review usefulness even though communication theories (e.g., Gallois & Giles, 2015; Ireland & Pennebaker, 2010) have long advocated that conversation style may alter receiver's perception towards sender as well as his/her shared content. Alike typical advertisements, Ludwig, de Ruyter, Friedman, Brüggem, Wetzels and Pfann (2013) suggest that review style may reinforce or attenuate the impact of a review since content and style in reviews are inherently inseparable. Indeed, even if a reviewer wants to convey the same message to the others (e.g., the size of the hotel room is big), he/she can create two sets of verbatim text if different linguistic styles are used in review writing (e.g., *"the hotel room is spacious"*; *"the hotel room is as big as the palace for the king and queen"*). Considering that online reviews are text-based communication which conversants can only convey and receive a message via written text, several researchers posit that the psycholinguistic effect of linguistic style has some influences on receiver's cognitive assessment as well as attitude towards review content (Kronrod & Danziger, 2013; Ludwig et al., 2013; Wu, Shen, Fan & Mattila, 2017). Though the impact of review style has been raised for several years, to the best of the author's knowledge, the impact of review style on receivers' assessment of review usefulness has never been examined in prior studies.

To redress the two limitations identified above, this study aims to examine the influence of content-, style- and source-related characteristics on receivers' perceived usefulness of online hotel reviews. Hovland (1948, p. 371) notes that social communication is "the process by which an individual transmit stimuli to modify the behavior of other individuals". Given that online review is one type of social communications working within a framework of "who says what in which form with what effect on the audience", from the theoretical standpoint, both review source (i.e., who says), review content (i.e., says what) and review style (i.e., which form) should be considered to explain the variation in receivers' evaluations of review usefulness (i.e., what effect on the audience). The current study focuses on nine characteristics that could influence readers' perceived usefulness of online hotel reviews: (1) review breadth, (2) review depth, (3) presence of photo/s, (4) volume of photo/s, (5) document-level linguistic style, (6) sentence-level linguistic style, (7) review readability, (8) reviewer expertise, and (9) reviewer reputation. These characteristics are selected based on the assertions from well-tested theories (e.g., Daft and Lengel's (1986) uncertainty reduction theory; Hovland, Janis and Kelley's (1953) source credibility theory) as well as empirical findings from previous research.



Through analyzing over 1,900 online reviews on hotels in five European cities which were published on TripAdvisor.com, one of the leading global travel information advice portals, this study contributes new knowledge to the growing literature by explicating the effect of review content, review style and review source on readers' perceived review usefulness. Besides redressing existing research voids and extending theoretical knowledge to the growing stream of research on online reviews, the managerial implications are also expected to be significant. As the presence of helpful reviews can not only help review sites by gaining more traffic but also benefit product or service providers by having a fairer assessment on the discussed subject, an improving understanding about the characteristics of helpful reviews can provide practitioners in the field with clues for guiding their reviewers in writing useful reviews.

## 2 REVIEW USEFULNESS

Defined as the extent to which a receiver perceives a review to be useful in performing his or her tasks (Pan & Zhang, 2011), review usefulness (also referred to as review helpfulness) is one of the most researched topics in both academic and industry research over the past few years. As discussed earlier, the large number of online reviews poses a potential threat of information overload for information seekers because individuals have finite limits to the amount of information they can process in a given period of time (Malhotra, 1982). Considering that receivers neither have time nor ability to analyze all reviews available online, the unresolved question of why some reviews are perceived to be more useful and influential than others is one possible reason why review usefulness has received considerable attention from researchers and practitioners. The high level of interest in review usefulness can also be explained by the profound influence of review usefulness on one's inclination to adopt or follow the review. As expounded by Sussman and Siegal's (2003) theory of information adoption, receiver's belief about the usefulness of received advice is consequential in determining his/her adoption intention. Alike what theory of technology acceptance postulates that an individual's intention to use a technology is determined by his/her perceived usefulness of the corresponding technology (Davis, 1989), several studies confirm that the positive relationship between information usefulness and consumer decision to adopt information is applicable to the online review context (Casaló, Flavián & Guinalú, 2011; Cheung, Lee & Rabjohn, 2008).

As online reviews become more pervasive and most portals embrace reputation-based governance mechanism (e.g., TripAdvisor.com's helpful function) to separate useful reviews from the rest, Libai and colleagues (2010) argue that the examination of factors affecting readers' perceived usefulness would be an exciting research area since the results will provide insightful implications for both researchers and practitioners in understanding how users behave under this reputation-based governance mechanism. Following Libai and colleagues' (2010) call with the increasing interest in resolving the question of "what makes a useful online review", a huge body of research exploring antecedents driving readers' perceived usefulness of reviews has been conducted in recent years (see Table 10). As shown in Table 10, majority of early studies focus on online reviews for tangible products and particularly electronic commodities (e.g., camera and printers). But since tourism service consumers appears to rely more on recommendations from others when they consider experience goods than search goods (Park & Lee, 2009), more research on factors affecting helpfulness of online reviews for tourism services has been conducted over the past few years.

On the other hand, while Table 10 displays that a diversified set of review-related characteristics has been examined in prior studies, researchers in fact often stress on some content- and source-related characteristics. Review valence has often been a matter of prime interest by pre-

vious researchers, and several studies expose the existence of negativity bias (i.e., negative reviews are perceived as more useful) in consumer reviews. Drawing on the results from two experiments on ten tangible products, the pioneering work by Sen and Lerman's (2007) finds negative reviews more useful than positive ones on average but product type (i.e., utilitarian or hedonic) would moderate the effect of review valence on perceived usefulness. Casaló, Flavián, Guinalú and Ekinci (2015) also report that negatively framed hotel reviews are perceived to be more useful than positively framed ones. They add that this bias is more prominent among high risk-averse travelers. The existence of positivity bias (i.e., positive reviews are perceived as more useful) is also unveiled in some studies. Schindler and Bickart (2012) report that a review is more likely to be rated as valuable if it has a greater proportion of positive evaluative statements. Similarly, Liu and Park's (2015) study on restaurant reviews exhibit that the level of review usefulness would be higher if it is positive (i.e., with higher star rating) and enjoyable to read from the reader's point of view.

Review elaborateness (also referred to as review length) is another frequently examined content-related characteristic. In general, review elaborateness is proven to have a positive impact on helpfulness of travel-related online reviews. According to their empirical results derived from conjoint analysis on reviews extracted from TripAdvisor.com Yang, Shin, Joun and Koo (2017) expose that review length is the third most important heuristic attribute affecting helpfulness of hotel reviews. Using restaurant reviews on Yelp.com as data source, Park and Nicolau (2015) as well as Liu and Park (2015) also support that longer reviews are perceived as more useful than shorter ones in the eyes of review readers. Regarding the influence of review elaborateness on helpfulness of product reviews, inconclusive results are found. By means of analyzing over 40,000 product reviews on Amazon.com, Pan and Zhang (2011) describe that longer reviews are more helpful than shorter one and the positive effect of review length on helpfulness is more manifest for utilitarian products than for experiential products. Racherla and Fiske (2012) however reveal that users of Yelp.com perceive reviews with fewer words as more useful than those containing more words. As numerous reviews are available for every provider, Racherla and Fiske (2012) argue that information overload and users' preference of short and straightforward reviews are two possible explanations for their research findings. In addition to valence and elaborateness, the impact of review extremity (e.g., Mudambi & Schuff, 2010), review rating conformity (e.g., Baek, Ahn & Choi, 2013), review abstractness (e.g., Li et al., 2013) and other content-related characteristics have also been coined in prior studies.

Pertinent to the characteristics of review source, the impact of reviewer identity disclosure has been examined in multiple studies. Forman, Ghose and Wiesenfeld (2008) note that readers rate reviews containing self-descriptive information as more helpful than anonymous reviews, but they are less responsive to reviewer disclosure of identity-descriptive information when reviews are unequivocal than when reviews are equivocal. While Racherla and Fiske (2012) report contrasting results in their work, Liu and Park's (2015) study show that reviews with self-disclosure

(e.g., address and photo) are evaluated as more useful and this garners support from Park and Nicolau (2015). Besides reviewer identity disclosure, considerable research has examined the influence derived from reviewer expertise and reputation. Weathers, Swain and Grover (2015) note that claiming expertise by citing direct experience or experience of others has a positive effect on review helpfulness. The subsequent study by Casaló et al. (2015) supports and empirically verifies there is a positive relationship between perceived reviewer expertise and perceived review usefulness. Though majority of existing literature corroborate the positive relationship between reviewer expertise and source credibility, a few studies (e.g., Fang et al., 2016; Liu & Park, 2015) conclude that the variable of expertise has no significant relationship with the review's usefulness. Additional research is still needed to verify the impact of review expertise on review usefulness. Regarding the impact of reviewer reputation on review usefulness, Baek et al. (2013) report that reviews written by Amazon's top-ranked reviewer generally have a higher level of review usefulness. Park and Nicolau (2015) also notice that reviews written by reputable reviewers are viewed as more useful, and this result is in line with other empirical studies like Racherla and Friska (2012).

TABLE 10. LIST OF SELECTED STUDIES EXPLORING FACTORS AFFECTING PERCEIVED USEFULNESS OF ONLINE REVIEWS

Author/s (Year)	Review product/s	Review characteristics <sup>a</sup>	Key findings
Sen and Lerman (2007)	10 tangible products (e.g., cell phones, PDAs and CDs)	(C) Review valence	Readers perceive negative reviews as more helpful when hedonic products are evaluated. Yet, readers perceive positive reviews as more helpful when utilitarian products are evaluated.
Forman, Ghose and Wiesenfeld (2008)	Books	(C) Review equivocality (SO) Identity disclosure	Readers rate reviews containing self-descriptive information as more helpful than anonymous reviews. However, readers are less responsive to reviewer disclosure of identity-descriptive information when reviews are unequivocal than when reviews are equivocal.
Mudambi and Schuff (2010)	6 tangible products (e.g., MP3 players, video games and laser printers)	(C) Review extremity (C) Review length	Reviews with moderate ratings are more helpful than those with extreme ratings for experience goods but not for search goods. Review length has a greater positive effect on the helpfulness of review for search goods than for experience goods.
Pan and Zhang (2011)	6 tangible products (e.g., CDs, video games and computer software)	(C) Review valence (C) Review length (C) Review volume (SO) Reviewer innovativeness	Both review valence and review length have positive effects on review helpfulness, but the product type moderates these effects. Expressed reviewer innovativeness and perceived review helpfulness have an inverted-U-shaped relationship.
Korfiatis, García-Bariocanal and Sánchez-Alonso (2012)	Books	(C) Review rating (ST) Review readability	Review helpfulness is positively affected by its rating. Highly helpful reviews contain more readable text than those that are less helpful.
Racherla and Friske (2012)	Furniture stores, restaurants, and spas	(C) Review extremity (C) Review elaborateness (SO) Identity disclosure (SO) Reviewer expertise (SO) Reviewer reputation	Review extremity has a partially significant impact on review usefulness. Also, reviewer expertise and reputation are positively correlated with the perceived usefulness of reviews.

Schindler and Bickart (2012)	Books and automobiles	(C) Valence of evaluative statements (C) Subject of descriptive statements (C) Proportion of statement (C) Number of statement	A review is more likely to be rated as valuable if it has a greater number of statements, a greater proportion of positive evaluative statements, a greater proportion of reviewer-descriptive statements, or a greater use of negative style characteristics.
Baek, Ahn and Choi (2013)	28 types of products (e.g., clothing, jewellerys, and sports & outdoors)	(C) Rating inconsistency (C) Word count (C) Negative word percentage (SO) Reviewer ranking (SO) Reviewer real name	Review helpfulness becomes higher if the review rating is congruent with product average rating. A top-ranked reviewer's review generally has a higher level of review usefulness.
Li, Huang, Tan and Wei (2013)	Mobile phone and laptop computer	(C) Content abstractness (SO) Review authorship	Readers perceive customer-written product review as more helpful than those written by experts. Moreover, a concrete review is rated as more helpful than an abstract one.
Casaló, Flavián, Guinalú and Ekinici (2015)	Hotels	(C) Review valence (C) Presence of graphical content (SO) Reviewer expertise	To readers, negative reviews are perceived as more useful than positive reviews. However, positive reviews are more useful when performed by expert reviewers than non-expert reviewers. Besides, the inclusion of a picture of a travel product affect the perceived usefulness of a positive review to a greater extent when the travel product brand name is unknown.
Filieri (2015)	Accommodations and restaurants	(C) Information quality (C) Information quantity (C) Customer ratings (SO) Source credibility	Readers' perceived information diagnosticity is primarily influenced by the quality of information, customer ratings and overall rankings. Source credibility, however, has a limited impact on their perception of information diagnosticity.
Huang, Chen, Yen and Tran (2015)	6 tangible products (e.g., cameras, printers, and CD)	(C) Word count (SO) Reviewer experience (SO) Reviewer impact (SO) Cumulative helpfulness	Word count is a significant predictor of review usefulness when the review is shorter than average. For top reviewers, their cumulative helpfulness is a significant predictor of review helpfulness.
Liu and Park (2015)	Restaurants	(C) Review rating (C) Review elaborateness (ST) Review readability (SO) Reviewer expertise (SO) Reviewer reputation	Reviewer reputation and identity disclosure have a significant impact on review usefulness. The level of review usefulness would also be higher if it has higher star rating, more words, easy and enjoyable to read from the reader's point of view.

Park and Nicolau (2015)	Restaurants	(SO) Identity disclosure (C) Review valence (C) Review elaborateness (ST) Review readability (SO) Reviewer expertise (SO) Reviewer reputation (SO) Identity disclosure	Readers perceive reviews with extreme ratings as more useful and enjoyable than those with moderate ratings. Reviews are rated as more useful if they are longer and written by expert or reputable reviewers.
Weathers, Swain and Grover (2015)	8 tangible products (e.g., vacuum cleaners, DVD players, and books)	(C) Review balance (SO) Reviewer claim of expertise	Balanced reviews (with both positive and negative information) are perceived as more helpful by readers. Claiming expertise by citing direct experience or experience of others has a positive effect on review helpfulness.
Agnihotri and Bhattacharya (2016)	4 types of products (e.g., phone, camera)	(C) Review rating (ST) Review readability (ST) Review sentimental tone (SO) Reviewer experience (SO) Reviewer identity	Review readability and review sentimental tone follow curvilinear relationships with review helpfulness. When a review is written by an experienced reviewer, a higher percentage of consumers find the review helpful even though it is too easy to comprehend.
Fang, Ye, Kucukusta and Law (2016)	Attractions	(C) Review rating (C) Review length (ST) Review readability (SO) Reviewer rating distance (SO) Reviewer rating distribution (SO) Reviewer experience	Reviews with higher level of readability and extreme sentiment generally have more helpful votes. Reviewers who stress the positive sides of the reviewed subject and have positive skewness (in terms of ratings) would receive more helpful votes.
Lee & Choeh (2016)	15 types of products (e.g., toy, music, DVD)	(C) Review depth (C) Review rating extremity (SO) Reviewer rank (SO) Identity disclosure	Reviewer reputation and review depth positively affect the helpfulness of an online product review. Review rating extremity and review depth are more positively related to helpfulness of reviews on search goods than on experience goods.
Salehi-Esfahani, Ravichandran, Israeli and Bolden (2016)	Restaurants	(C) Review extremeness (SO) Source credibility	Review extremity and source credibility are positively related to perceived information usefulness.

Yang, Shin, Joun and Koo (2017)	Hotels	(C) Review rating (C) Review length (C) Review photo (SO) Reviewer location (SO) Reviewer level (SO) Reviewer helpful vote	Review rating and reviewer helpful vote attributes are the most important heuristics affecting review helpfulness. Review length, review photo and reviewer level are positively associated with review helpfulness but at a lesser extent.
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**Note:** <sup>a</sup> (C) represents content-related characteristic; (SO) represents source-related characteristic; (ST) represents style-related characteristics.



## 3 RESEARCH MODEL AND HYPOTHESES

### 3.1 Content-related characteristics

#### 3.1.1 Review breadth

Research in services marketing has long advocated that service consumers consider the performance of both core component (i.e., what a customer receives) and peripheral component (i.e., the way in which a customer receives) in the service evaluation because both components are inseparable in nature (Bitner, 1992; Iacobucci & Ostrom, 1993). Indeed, since multiple parties and human interaction are involved in the service production, numerous studies prove that consumers often assess and describe multiple components when they evaluate their hotel-staying experience. For instance, Levy, Duan and Boo's (2013) study on negative hotel reviews reveals that an average of 3.7 problem areas are reported in each review. The mentioned areas comprise both core (e.g., bathroom and guestroom cleanliness) and peripheral components (e.g., check-in service by and attitude of front desk staff). Xiang, Schwartz, Gerdes and Uysal (2015) recently synthesize 60,648 hotel reviews on Expedia.com. The findings in their study indicate that a wide spectrum of core components (e.g., bed and bathroom) and peripheral components (e.g., courteous, friendly, smelled) about hotel guest experience are mentioned by reviewers in their textual comment.

Review breadth, which is defined as the number of product feature/s covered by a review (Dong, Schaal, O'Mahony, McCarthy & Smyth, 2013), is conceptually a crucial determinant affecting reader's assessment of review usefulness. Since consumers search and rely on reviews with the primary purposes of reducing risk and/or gaining assurance by similar others (Kim et al., 2011), broad reviews discussing various aspects of tourism services are expected to be helpful for consumers to gain in-depth information without additional search cost, to fantasize the described service or experience concretely, as well as to gain confidence in their decision. Cheung et al. (2008) confirm that perceived comprehensiveness of information by receivers is a predictor of their perceived information usefulness, and receivers' perceived information usefulness may in turn positively affect their adoption intention. Bae, Lee, Suh and Suh's (2016) latest work also reveals that reviews with both lodging and surrounding area information are rated as more useful (as opposed to reviews with lodging information only) to Airbnb users in Korea. Daft and Lengel (1986) argue that advices with richer information tend to be more useful to information seekers because this sort of advices can decrease their uncertainty. Drawing on the theorem of Daft and Lengel's (1986) uncertainty reduction theory as well as evidences from prior works, this study hypothesizes that:

**H1.** *Review breadth (as measured by the number of hotel-related feature/s discussed in a review) has a positive impact on receivers' perceived usefulness of online hotel reviews.*

### **3.1.2 Review depth**

Referring to the another level of information richness of reviews, the depth of review content (as measured by number of word/s included in a review) is another crucial factor affecting readers' thought on its persuasiveness and usefulness. Since a consumer review is theoretically an argument made by a reviewer to either persuade or dissuade other consumers from buying a product or service, the number of words included in a review is a straightforward heuristic cue reflecting the richness of information that reviewer can offer to support his/her stance. In general, longer reviews comprise more product descriptions as well as specifics about how and where the product is used in various contexts. Huang et al. (2015) add that the increase in word count would increase both the quantity and the quality of information because the word count reflects the extensiveness and completeness of review content. Given that the richness of information can help readers reduce product quality uncertainty and allow them to picture themselves buying and using the product (Daft & Lengel, 1985), the depth of review content matters when readers assess usefulness of reviews. Another reason supporting this hypothesized relationship is that review depth may signal the involvement of review providers (Racherla & Fiske, 2012). As the providers of long reviews are usually more enthusiastic due to their very satisfactory or dissatisfactory experience with the subject under review, they possess greater knowledge and are thus more likely to explicate all aspects pertinent to their usage experience in detail.

The impact of review depth on review helpfulness has been examined in several studies. Mudambi and Schuff's (2010) study empirically demonstrate that the length of reviews has a positive effect on the helpfulness of the review. Huang et al. (2015) echo with Mudambi and Schuff's (2010) proposition that word count is a significant predictor of review helpfulness. But their empirical findings reveal that this relationship is valid until the number of word count reaches a threshold of 144 words. Besides the above two studies, a number of studies have proven that longer reviews are perceived as more useful than shorter ones in the eyes of review readers (Liu & Park, 2015; Pan & Zhang, 2011; Park & Nicolau, 2015). With reference to the findings from prior studies, this study postulates that:

**H2.** *Review depth (as measured by the number of word/s included in a review) has a positive impact on receivers' perceived usefulness of online hotel reviews.*

### 3.1.3 Presence and volume of photo/s

Thanks to the advancement in digital communication technology, it has become easier for consumers to post photos and other forms of visual information on consumer review sites in order to share their experience on product purchased or service encountered (Lin, Lu & Wu, 2012). Yelp.com allows reviewers to attach photos with their reviews since June 2013, and TripAdvisor.com now allows contributors to add up to ten photos with each review. As a form of the pictorial representation of a product (Kim & Lennon, 2008), photos have long been proven as being capable of helping consumers to familiarize and virtually experience a company's products and services in the computer-mediated environment (Koernig, 2003; Krentler & Gultinan, 1984). Kisielius and Sternthal (1984) note that visual information can better evoke one's cognitive elaboration and memory capacity of stimulus information. Townsend and Kahn (2013) agree and later verify that consumers perceive visual form of information to be easier, faster, more enjoyable than other forms of communication. This justifies why people often remember advertisements in the text-photo format better than those in the text-only format (Hirschman, 1986; Shepard, 1967).

The impact of photos on eWOM communication effect has been increasingly investigated in recent years (e.g., Casaló et al., 2015; Lee & Tussyadiah, 2010; Lin et al., 2012). The survey results in Lee and Tussyadiah's (2010) study report that photos combined with textual explanations is the most influential form of eWOM that can provoke Korean nations' travel motivation. Lin et al.'s (2012) experimental study also exhibits that readers rated eWOM articles with pictures significantly higher in message quality and message credibility than the same articles without pictures. In the hospitality context, Casaló et al. (2015) assert and empirically verify that the usefulness of online reviews for an unknown hotel is much greater when a picture is included than without a picture. Another work by Yang, Hlee, Lee and Koo (2017) also suggest that the combination of textual and imagery cues in restaurant reviews is likely to have a stronger effect on review usefulness. In the same study, the researchers report that the volume of food and beverage images has a positive influence on review usefulness. Given that photos can capture and vividly demonstrate the specifics of the discussed object (e.g., room layout and bathtub design), it is believed that the presence of photo(s) in a review can enhance the convincingness of the textual content and thereby assisting readers to thoroughly assess the quality of the discussed object. To examine whether the cliché of "a picture is worth a thousand words" is applicable to hotel reviews as well as to validate the impact of photos on hotel review usefulness, this study hypothesizes that:

**H3.** *Hotel reviews with a photo/photos are perceived to be more useful than those without a photo/photos.*

**H4.** *The volume of photo/s in a review (as measured by the number of photo/s attached with a review) has a positive impact on receivers' perceived usefulness of online hotel reviews.*

## 3.2 Style-related characteristics

Unlike traditional word-of-mouth in the offline context, providers of online reviews mostly rely on open-ended texts to describe their experience and express opinions on the reviewed subject with other audiences in the review portals. As providers can freely choose the language and style to compose their reviews, provider's choice of linguistic style as well as the readability of their written text may potentially affect receivers' comprehension of review content as well as their assessment of review usefulness.

### 3.2.1 Document-level linguistic style

At the document level, Noone and McGuire (2013) note that review providers primarily use functionally-oriented language (hereinafter to be referred as functional language) or emotionally-oriented language (hereinafter to be referred as emotional language) in review writing. In brief, reviews using functional language would describe an experience in a descriptive and rational fashion (e.g., *"the guestroom is very spacious"*). In contrast, reviews using emotional language would describe an experience in an affect-rich manner because writers would use metaphors, hyperboles and other idiomatic expressions to convey an additional connotation or reflect their emotions (e.g., *"the guestroom is bigger than in a palace"*). Jensen, Averbeck, Zhang and Wright (2013) argue that language of high affect intensity will make the individual seem irrational and unreliable. Indeed, Papathanassis and Knolle's (2011) grounded theory based study reveals that narrative emotionality is a hidden sign of subjectivity, which reduces the factual value of review content. Pan and Zhang (2011) also state that reviews with many emotional statements may introduce idiosyncratic noises and therefore undermining their overall usefulness in informing readers about the quality of the reviewed product.

Following the concepts of conversational norms and linguistic expectations, Kronrod and Danziger (2013) conjecture that reviews using language with high emotional intensity (defined as figurative language in their study) lead to more favorable attitudes in hedonic consumption contexts because emotional language is more often used in those contexts. Wu, Shen, Fan and Mattila (2017) recently extend Kronrod and Danziger's (2013) work by examining the impact of language style on consumers' reactions to online reviews. Since emotional language is not often used in conversations among unfamiliar or unknown individuals, Wu et al. (2017) report that consumers exhibit less favorable attitudes and lower reservation intention after reading a review written in in emotional (versus functional) language. Considering that the atypical use of

emotional language in online reviews may potentially make a review look irrational and unreliable, adding that readers require relatively less cognitive effort in interpreting the content in reviews using functional language, this study hypothesizes that:

*H5. Hotel reviews using functional language are perceived to be more useful than those using emotional language.*

### **3.2.2 Sentence-level linguistic style**

Besides the document-level linguistic style, several researchers postulate that the sentence-level linguistic style reviewers opt to frame their opinions can influence the extent of information given to review readers (e.g., Jindal & Liu, 2006; Zhang, Zeng, Li, Wang & Zuo, 2009). According to Qazi, Raj, Tahir, Waheed, Khan and Abraham (2014), review providers usually frame their opinions on an entity using descriptive sentences, comparative sentences or/and suggestive sentences. These three types of sentence styles can provide different level of information to review readers due to their idiosyncratic linguistic construct as well as syntactic forms (Qazi et al., 2014), and they can be used individually and collectively in a single review.

Reviews using descriptive sentences can provide readers with an overview of an entity from single (e.g., *“the service quality of Hotel A is poor”*) or multiple aspects (e.g., *“To me, the location of Hotel A is perfect and its service is also top notch”*). Through reading the descriptions provided, readers can understand the quality of the reviewed entity from the provider’s viewpoint. Using gradable (e.g., *“Hotel A is better than Hotel B in terms of location”*) or/and non-gradable comparatives (e.g., *“Hotel A has a rooftop bar but B does not have it”*), Jindal and Liu (2006) note that reviews using comparative sentences can inform readers an ordering relation between two (or more) entities according to a common feature (Jindal & Liu, 2006). Through adding suggestive (e.g., *“I highly recommend this hotel to you”*) or/and performatives utterances (e.g., *“I will come back next year”*) in the description, Qazi et al. (2014) suggest that reviews using suggestive sentences can offer advice or direction for readers to improve their decision making.

Compared to the approach of using descriptive sentences, Jindal and Liu (2006) argue that reviews using comparative sentences can provide more information to readers because the latter one performs the dual role of description and comparison. Since the comparatives in those comparative reviews enable customers to acknowledge the similarities and discrepancies between two comparable entities, reviews using comparative sentences can thus better help customers make informed decisions. Kumar (2011) also notes that reviews using suggestive sentences are more useful to potential customers because the presence of suggestive clues can subtly guide readers into making a better decision. In addition to the theoretical discussions presented above, Qazi and colleagues (2017) recently report that comparative and suggestive reviews are more influential than descriptive reviews in forming opinions of individuals. Another recent work

by Qazi and colleagues (2016) also verify that the sentence-level linguistic style can moderate the effect of review length on review helpfulness. Using the panel data retrieved from TripAdvisor.com, their empirical findings exhibit that reviews using comparative sentences are perceived as more helpful than those using descriptive sentences when the review is wordy. On the contrary, reviews using suggestive sentences are considered as more helpful than those using descriptive sentences when the review is less wordy. Considering that the theoretical discussions and empirical findings from previous research consistently exhibit that information presented using comparative or suggestive sentences are more useful to readers than that of using descriptive sentences, the following hypothesis is posited:

*H6. Hotel reviews using comparative or/and suggestive sentences are perceived to be more useful than those using descriptive sentences only.*

### **3.2.3 Review readability**

Referring to the effort and educational level required for a person to comprehend a piece of text (DuBay 2004), a plethora of studies demonstrate that readability of review content is an important linguistic characteristic affecting readers' perceived review helpfulness as well as review adoption (e.g., Krishnamoorthy, 2015; Zakaluk & Samuels, 1988). Typically, reviews with high level of readability are more likely to be perceived as understandable and voted as helpful by readers compared to the ones with low level of readability (Fang et al., 2016; Hu & Chen, 2016; Korfiatis, García-Bariocanal & Sánchez-Alonso, 2012; Liu & Park, 2015). Korfiatis et al. (2012) state that the positive relationship between review readability and review helpfulness can be explained by the cognitive fit between review text and readers' expertise. Hu and Chen (2016) also note that readers perceive reviews as helpful when the usage of words in a review text matches their comprehension ability.

Previous studies have introduced various types of scale-based indications for measuring how difficult a piece of text is for readers to comprehend based on its linguistic characteristics, syntactical elements and writing styles. These include but not limited to Automated Readability Index (Smith & Kincaid, 1970), Coleman-Liau Index (Coleman & Liau, 1975), Flesch-Kincaid Grade Level (Kincaid, 1981), Gunning Fog Index (Gunning, 1969) and Simple Measure of Gobbledygook (McLaughlin, 1969). Besides the above indices, Flesch's (1951) Flesch-Kincaid Reading Ease (FRE) index is another representative and widely used text readability measurement method (e.g., Koratis et al., 2012; Liu & Park, 2015). With a score range from 0 to 100 which can be calculated using function (1), Flesch (1951) suggests that the resulting index would indicate the school grade level required by a reader to fully comprehend the piece of text provided. If a review's FRE index is lower than 30, it indicates that the overall readability of the content in that review is at the level of university graduates. If a review's FRE index is between 60 and 70, it indicates

that the content is comprehensible by 13- to 15-year-old students. Reviews whose FRE index is over 90 indicate that their content can be easily understood by 11-year-old students.

$$FRE = 206.835 - 1.015 x \frac{\text{total words}}{\text{total sentences}} - 84.6 \left( \frac{\text{total syllables}}{\text{total words}} \right) \quad (1)$$

No matter which readability test is applied, previous studies consistently report that highly helpful reviews contain more readable text than reviews that are less helpful. As such, the seventh hypothesis of this study postulates that:

*H7. Review readability (as measured by the Flesch-Kincaid Reading Ease index) has a positive impact on receivers' perceived usefulness of online hotel reviews.*

### 3.3 Source-related characteristics

#### 3.3.1 Reviewer expertise

Defined as the extent to which an information source is perceived as being capable of providing correct and valid assertions, source expertise has long been identified as a dimension and an antecedent of credibility of an information source (Hovland et al., 1953). Typically, reviews written by expert reviewers are rated as more persuasive and useful due to two reasons. The first reason is that expert reviewers often have greater knowledge and exposure about the reviewed topic than non-expert reviewers (Schiffman & Kanuk, 1997). Another reason why expert reviewers are more likely to contribute useful reviews is that experts will be familiar with the aspects of a good review when their review writing experience accumulates (Huang et al., 2015). Dellarcas (2006) describes that reviewers or even service providers can create pseudo-identity (e.g., claiming himself/herself as expert) due to the absence of identity verification mechanism in most online communities. Although some researchers challenge the validity of expertise in the online settings, Yang and Mai's (2010) recent work exhibits that online video game players still trust more on comments from expert reviewers since these reviewers have significant contribution to and established their expertise in the community. As recommendations from expert reviewers often provide more diagnostic and valuable information to readers in making better purchase decisions, several empirical studies also corroborate there is a positive relationship between reviewer expertise and review usefulness (e.g., Li et al., 2013; Park & Nicolau, 2015).

In theory, Schiffman and Kanuk (1997) suggest that reviewers are perceived to possess a high degree of expertise by virtue of their knowledge and experience. In practice, however, the objective measure to verify whether reviewers has expertise in the area does not always exist. In the online context, the anonymous nature of online reviews makes readers hard to assess providers' expertise. Due to the absence of objective measure, Dou, Walden, Lee and Lee (2012)

suggest that consumers generally assess online reviewers' expertise on the basis of their past behavior such as the number of the reviews written before and then form impression towards the reviewers. To conclude, in order to verify the relationship between reviewer expertise and review usefulness in the online hotel review context, this study uses reviewers' previous review contribution to determine one's reviewer expertise and then tests the following hypothesis:

**H8.** *Reviewer expertise (as measured by the number of review/s that providers contributed since they registered their account) has a positive impact on receivers' perceived usefulness of online hotel reviews.*

### 3.3.2 Reviewer reputation

Besides being inclined to follow experts' suggestions, it is common to see that consumers tend to place more trust on reviews made by opinion leaders or reputable members. Defined as the extent to which receivers believe a communicator is honest and concerned about others (Jarvenpaa, Tractinsky & Vitale, 2000), several researchers note that reviewer reputation is another crucial heuristic affecting how readers perceive a review as useful or not (Liu & Park, 2015; Rachlerla & Friske, 2012). By tradition, source reputation stems from nominations by others. Yet, in the online context and particularly consumer review sites, a nomination mechanism is often employed to determine the reputation of each reviewer. With that mechanism, other members can nominate or reward reviewers by giving helpful votes to their reviews. Given those helpful votes are accumulative and collectively formed by all members of the same community (e.g., Yelp.com: reviewer's number of accumulated friend; TripAdvisor.com: reviewer's number of accumulated helpful votes), those metrics can serve as an indication of a reviewer's reputation and infer the usefulness of information provided by that reviewer (Davenport & Prusak, 1998). Zacharia, Moukas and Maes (2000) posit that the determination of a reviewer's reputation should be a function of numerous variables like duration of their relationship or membership, frequency of participant activities, ratings by other members and others. But since review readers do not usually engage in this complicated computation process, it is believed that the number of helpful reviews voted by others is a parsimonious indicator they employ to determine the reputation of reviews.

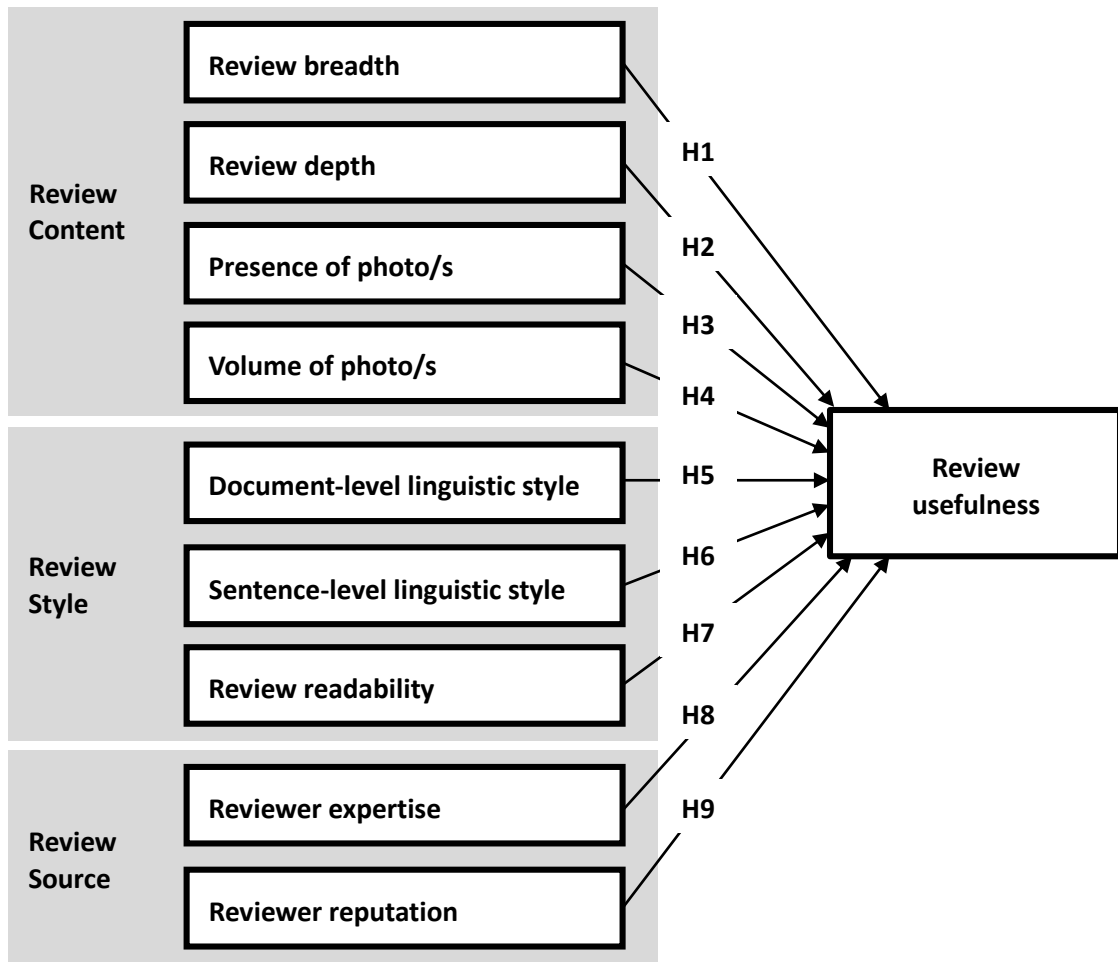
Alike using reviewer expertise as a heuristic cue of information quality, recommendations and opinions from opinion leaders or reputable members are usually perceived as more credible and useful. One possible reason is that the status of opinion leaders is well recognized by other members in the community or the public (Zacharia et al., 2000). As an individual's positive reputation and peer recognition may induce others people's trust towards him/her (Pavlou & Gefen, 2004),



Guéguen and Jacob (2002) argue that authority and reputation of information sources may create greater compliance. In light of the previous findings, the last hypothesis is presumed as follow and Figure 2 exhibits the research model proposed in this study:

**H9.** Reviewer reputation (as measured by the number of helpful vote/s that providers received since they registered their account) has a positive impact on receivers' perceived usefulness of online hotel reviews.

FIGURE 2. CONCEPTUAL FRAMEWORK OF STUDY 2



## 4 METHODOLOGY

To test the conceptual framework and the nine hypotheses discussed in the previous section, a panel data analysis was conducted based upon a set of hotel reviews which were publicly available in TripAdvisor.com. The prominent visibility and popularity of TripAdvisor.com among travelers is the primary reason why TripAdvisor.com is chosen. Alexa (2017) reports that TripAdvisor.com is the second most popular travel-related website (in terms of website traffic). With over 390 million monthly unique visitors and over 465 million reviews in their database (TripAdvisor, 2017a), numerous studies have also coined that the large collection of travelers is what make reviews on TripAdvisor.com useful to prospective travelers (e.g., Lee, Law & Murphy, 2011). Another reason why TripAdvisor.com is chosen is that each review in their collection contains all information required for testing the hypotheses, which include usefulness level of each review (e.g., helpful votes of each review), testimonies of reviewer (e.g., number of reviews each provider contributes before and the accumulated helpful votes they receive), as well as descriptions and/or comments on their hotel staying experience (e.g., textual comments).

### 4.1 Data collection

#### 4.1.1 Research sampling

In early 2016, the author of this study collected 2,000 reviews on 100 hotels from top five European city destinations (including London, Antalya, Prague, Milan, Berlin) based on the 2014 edition of Euromonitor's (2016) Top City Destination Ranking. Hotels in multiple cities were included with the purpose of reducing the geographical effect on the results. A consistent number of reviews (i.e., 400) was extracted from each of those five cities to constitute the samples. Twenty hotels in each city were included, and every fifth hotel was chosen (i.e., the 1st, 6th and 11th hotels and so forth were chosen). Twenty reviews of each hotel were chosen, and every fifth review was included in the samples (i.e., the 1st, 6th and the 11th reviews and so forth were chosen). Applying this method to collect review samples, it is believed that a representative sample of reviews on hotels at various rankings and ratings were included for analysis.

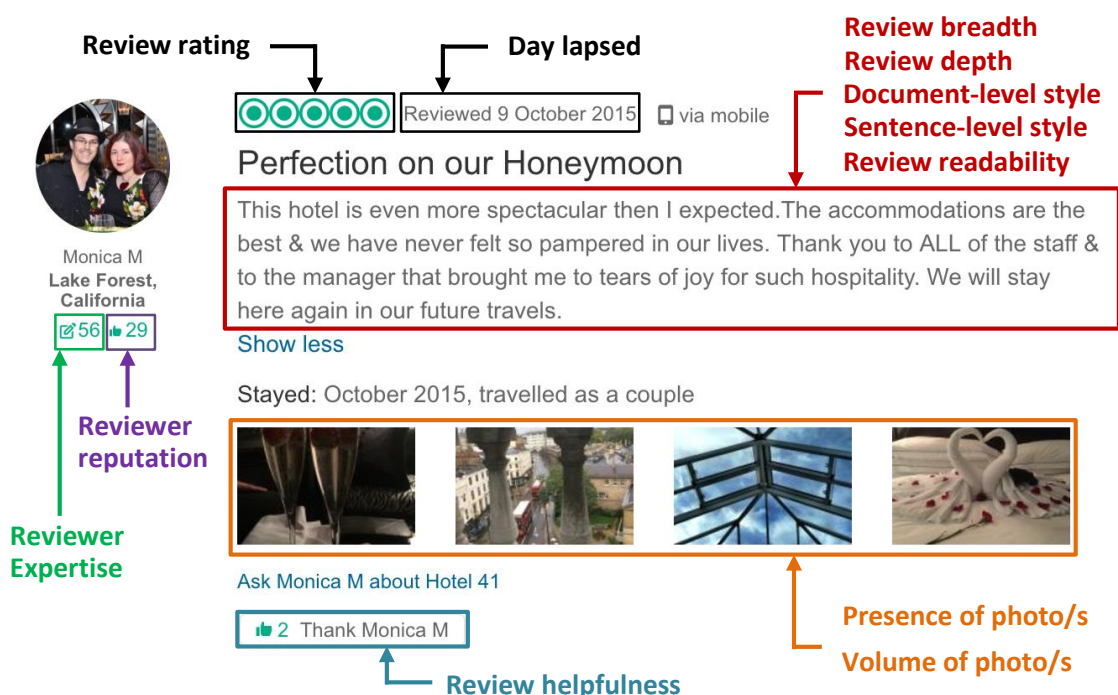
#### 4.1.2 Operationalization of variables

The content-, style- and source-related characteristics retrieved from the selected case are illustrated in Figure 3. Mudambi and Schuff (2010) note that the number of helpful vote is an indicator of review diagnosticity to separate useful reviews from the rest from readers' point of view. As the helpful function is available and widely used in TripAdvisor.com, the number/s of

helpful vote/s awarded to a review since it was posted serves as the proxy for measuring review usefulness. Regarding the operationalization of those content-related characteristics, review breadth is measured by counting the number/s of hotel-related feature/s discussed in a review. Review depth is measured by the number/s of word/s included in a review. Presence of photo(s) is a binary variable which “1” represents a photo/s is available in that review, while “0” represents no photo is available in that review. To those reviews with photo/s, the volume of photo/s is measured by the number/s of photo/s attached with a review.

To those style-related characteristics, the document-level linguistic style is a binary variable which “0” represents emotional language is used in review writing or emotional statement/s is included in the review content, while “1” represents functional language is used by the writer. The sample review shown in Figure 3 is classified as using emotional language because hyperbole (e.g., “... we have never felt so pampered in our lives”) was used to describe his/her experience. Since descriptive sentences, comparative sentences and suggestive sentences can be used individually and collectively in a single review, the sentence-level linguistic style is a tetrachotomous variable with four levels: “0” represents reviews using solely descriptive sentences; “1” represents reviews using descriptive and comparative sentences; “2” represents reviews using descriptive and suggestive sentences; “3” represents reviews using descriptive, comparative and suggestive sentences. Lastly, review readability is measured according to the FRI index of the text of each review. The FRI index is chosen because it has been extensively used in previous online review studies like Korfiatis et al. (2012) as well as Krishnamoorthy (2015).

FIGURE 3. ILLUSTRATION OF THE VARIABLES RETRIEVED FROM A REVIEW ON TRIPADVISOR.COM



Unlike review depth and review readability which can be computed using computer software, the identification of review breadth, document-level linguistic style and sentence-level linguistic style was manually conducted by six investigators including the author and five undergraduate students. The recruited students received an introduction of and training on hotel review analysis before the analysis. The investigators conducted the coding separately, and the results were cross-checked to verify the accuracy and reliability. Krippendorff's alpha was calculated based on the coding results to guarantee the intercoder reliability. The alpha values for review breadth, document-level linguistic style and sentence-level linguistic level are 0.82, 0.75 and 0.78. All are higher than the threshold value of 0.7, indicating that the reliability is reasonably good (Krippendorff, 1987). All disagreement cases were discussed to reach consensus.

In the community of TripAdvisor.com, each provider's past contribution and recognition are accumulated on a continuous basis. Hence, to those source-related characteristics, the number/s of review/s which providers contribute since they register their account represents reviewer's level of expertise. Reviewer reputation is measured based on the number/s of helpful vote/s providers receive since they register their account. In addition to the abovementioned analysis variables, day lapsed (i.e., the difference between the date the review was posted and the date the review was collected) is considered as a control variable since the number of votes received by a review could potentially be a function of the number of days the review has been available on the website (Fang et al., 2016; Pan & Zhang, 2011). Review rating is also considered as a control variable in this study because prior studies empirically confirm that review helpfulness is contingent upon its overall rating (Mudambi & Schuff, 2010; Park & Nicolau, 2015). Table 11 lists the variables included in this study and the description of how they are operationalized.

**TABLE 11. LIST OF VARIABLES AND DATA DESCRIPTIONS**

<b>Variable</b>	<b>Description (Source)</b>
<b>Dependent variable</b>	
<b>Review usefulness</b>	The number of helpful vote/s awarded to a review since it was posted (Mudambi & Schuff, 2010)
<b>Content-related variables</b>	
<b>Review breadth</b>	The number of hotel-related feature/s discussed in a review (Dong, Schaal, O'Mahony, McCarthy & Smyth, 2013)
<b>Review depth</b>	The number of word/s included in a review (Mudambi & Schuff, 2010)
<b>Availability of photo(s)</b>	(0): Photo(s) is not available in a review (1): Photo(s) is available in a review

<b>Volume of photo(s)</b>	The number of photo/s attached with a review
<b>Style-related variables</b>	
<b>Document-level style</b>	(0): Emotional language is used for writing a review (1): Functional language is used for writing a review
<b>Sentence-level style</b>	(0): Only descriptive sentences are used in a review (1): Descriptive and comparative sentences are used in a review (2): Descriptive and suggestive sentences are used in a review (3): Descriptive, comparative and suggestive sentences are used in a review
<b>Review readability</b>	Flesch-Kincaid Reading Ease index of the text of a review
<b>Source-related variables</b>	
<b>Reviewer expertise</b>	The number of review/s that provider contributes since they register their account (Liu & Park, 2015)
<b>Reviewer reputation</b>	The number of helpful vote/s that provider receives since they register their account (Liu & Park, 2015; Racherla & Friske, 2012)
<b>Control variables</b>	
<b>Day lapsed</b>	The number of days a review has been available on TripAdvisor.com (Fang, Ye, Kucukusta & Law, 2016)
<b>Review rating</b>	The overall rating a reviewer gives as the overall assessment of his/her hotel-staying experience (Pan & Zhang, 2011)

## 4.2 Data analysis

Table 12 exhibits that a majority of reviews in the dataset did not receive any helpful vote. Even though the frequency of all zeros is excluded, the frequencies of other helpful vote numbers is not normally distributed. Adding to the fact that the dependent variable (review usefulness) in the current study is a count variable, compared to the ordinary least square linear regression model, count data models are more appropriate to be used in this study.

**TABLE 12. DISTRIBUTION OF REVIEW HELPFUL VOTES IN THE DATASET**

Helpful vote number	Frequency	Percentage
0	1,075	53.75%
1	484	24.20%
2	203	10.15%
3	101	5.05%

4	63	3.15%
5	32	1.60%
6	14	0.70%
7	7	0.35%
8	4	0.20%
9	4	0.20%
10	6	0.30%
≥ 11	7	0.35%
Total	2,000	100%

Poisson regression and negative binomial regression model are two typical count data models, as Greene (2011) notes. One condition of using Poisson regression is that the mean of dependent variable has to be equal to its variance. But since the dataset does not satisfy the assumption of mean-variance equality (mean = 0.990; variance = 3.028), Poisson regression cannot be used in this study due to the over-dispersion problem. To ease the Poisson assumption stipulated by Poisson regression, following Cameron and Trivedi (2005) as well as Greene (2011), this study applies negative binomial regression with robust standard errors to examine how the chosen independent variables influence review helpfulness. The probability of an online review  $t$  receiving a number  $y_t$  of helpful votes is given by function (2):

$$P(y_t) = \frac{\gamma(\alpha^{-1} + y_t)}{\gamma(\alpha^{-1}) \gamma(y_t + 1)} \left( \frac{\alpha^{-1}}{\alpha^{-1} + e^{\sum_{k=1}^K \beta_k x_{tk}}} \right)^{\alpha^{-1}} \left( \frac{e^{\sum_{k=1}^K \beta_k x_{tk}}}{\alpha^{-1} + e^{\sum_{k=1}^K \beta_k x_{tk}}} \right)^{y_t} \quad (2)$$

$$\forall y_t = \{0, 1, 2, \dots\}$$

where  $\gamma$  represents the Gamma function

$x_{tk}$  the characteristic  $k$  of online review  $t$

$\beta_k$  the parameter which indicates the effect of  $x_{tk}$  on  $P(y_t)$

## 5 RESEARCH FINDINGS

### 5.1 Descriptive statistics of variables

Prior to the main analysis, the examination of data was firstly conducted since the presence of outliers can create substantial effects on research results. Through rigorously examining the distribution of review samples for each variable, 67 out of the 2,000 collected cases were excluded from analysis because they are substantially different from other cases on one or more variables. Hence, the number of valid cases included for the analysis in this study is 1,933. To ensure the generalizability and predictive accuracy of the regression model, following the assertion by Hair, Black, Babin and Anderson (2010) as well as Steckel and Vanhonacker (1993), the valid cases were randomly divided into two subsamples - analysis sample ( $n_{ANA} = 1,450$ , 75%) and holdout sample ( $n_{HLD} = 483$ , 25%). The analysis sample was firstly used for estimating the regression model and the parameters, while the holdout sample was then used to validate the predictive ability of the regression model.

Table 13 provides the descriptive statistics of all independent variables included in the regression analysis. On average, the analysis sample included approximately 116 words ( $mean_{ANA} = 116.05$ ,  $SD_{ANA} = 91.021$ ) and they discussed around six different features of the reviewed hotels ( $mean_{ANA} = 6.38$ ,  $SD_{ANA} = 2.972$ ). Although most of them did not include a photo/s ( $n_{ANA} = 1,364$ , 94.1%), the readability of review text in the analysis sample was high in general ( $mean_{ANA} = 67.08$ ,  $SD_{ANA} = 11.539$ ). Contributors of the analysis sample mostly utilized functional language ( $n_{ANA} = 1,342$ , 92.6%) in review writing, and they rarely included comparative sentence/s ( $n_{ANA} = 101$ , 7%) or suggestive sentence/s ( $n_{ANA} = 273$ , 18.8%) in their reviews. The variance of reviewers' expertise is large ( $mean_{ANA} = 25.87$ ,  $SD_{ANA} = 40.345$ ) as one third of the analysis sample's providers contributed five or less reviews before, but another 20% contributed 35 or above reviews in the past. Similarly, the variance of analysis sample's reviewer reputation is relatively large ( $mean_{ANA} = 16.62$ ,  $SD_{ANA} = 25.749$ ). The characteristics of the holdout sample are similar to that of the analysis sample (see "Holdout sample" column of Table 13). They included around 117 words ( $mean_{HLD} = 117.07$ ,  $SD_{HLD} = 92.842$ ) discussing about six features of the reviewed hotels ( $mean_{HLD} = 6.25$ ,  $SD_{HLD} = 3.095$ ). The review text of the holdout sample was highly readable ( $mean_{HLD} = 66.59$ ,  $SD_{HLD} = 12.395$ ). They were primarily written using functional language ( $n_{HLD} = 441$ , 91.3%), and no photo/s was attached ( $n_{HLD} = 458$ , 94.8%).

TABLE 13. DESCRIPTIVE STATISTICS OF INDEPENDENT VARIABLES

Variables <sup>a</sup>	Analysis sample (n = 1,450)					Holdout sample (n = 483)				
	n (Percent)	Mean	SD	Min	Max	n (Percent)	Mean	SD	Min	Max
<b>Control variables</b>										
Day lapsed	1,450 (100%)	240.75	313.605	1	1,938	483 (100%)	223.59	276.317	1	1,919
Review rating	1,450 (100%)	4.47	0.874	1	5	483 (100%)	4.39	0.945	1	5
<b>Content-related variables</b>										
Review breadth	1,450 (100%)	6.38	2.972	1	20	483 (100%)	6.25	3.095	1	18
Review depth	1,450 (100%)	116.05	91.021	7	552	483 (100%)	117.07	92.842	21	552
Review - with photo/s	86 (5.9%)	-	-	0	1	25 (5.2%)	-	-	0	1
Review - without photo/s	1,364 (94.1%)	-	-	0	1	458 (94.8%)	-	-	0	1
Review photo number	1,450 (100%)	0.16	0.719	0	6	483 (100%)	0.10	0.515	0	5
<b>Style-related variables</b>										
Document-level style – Functional	1,342 (92.6%)	-	-	0	1	441 (91.3%)	-	-	0	1
Document-level style – Emotional	108 (7.4%)	-	-	0	1	42 (8.7%)	-	-	0	1
Sentence-level style – COM	101 (7.0%)	-	-	0	1	43 (8.9%)	-	-	0	1
Sentence-level style – SUG	273 (18.8%)	-	-	0	1	95 (19.7%)	-	-	0	1
Sentence-level style – COM + SUG	28 (1.9%)	-	-	0	1	8 (1.7%)	-	-	0	1
Sentence-level style – DES	1,048 (72.3%)	-	-	0	1	337 (69.8%)	-	-	0	1
Review readability	1,418 (97.8%)	67.08	11.539	7	97	467 (96.7%)	66.59	12.395	6	95
<b>Source-related variables</b>										
Reviewer expertise	1,450 (100%)	25.87	40.345	0	280	483 (100%)	24.41	35.968	0	277
Reviewer reputation	1,450 (100%)	16.62	25.749	0	204	483 (100%)	16.33	26.922	0	190

**Note:** <sup>a</sup> **Sentence-level style – COM:** reviews using descriptive and comparative sentences; **Sentence-level style – SUG:** reviews using descriptive and suggestive sentences; **Sentence-level style – COM + SUG:** reviews using descriptive, comparative and suggestive sentences; **Sentence-level style – DES:** reviews using descriptive sentences only.



## 5.2 Hypothesis testing

To ensure there is no perfect collinearity among the independent variables, a series of diagnostic tests were conducted before the hypothesis testing. A correlation analysis including all variables was firstly conducted and the correlation matrix is shown in Table 14. Although the correlation coefficient of reviewer expertise and reviewer reputation is relatively high ( $r = 0.827$ ), these two variables are logically highly correlated because reviewers who contribute more reviews to the site naturally have more opportunities to receive helpful votes from readers. Adding to the fact that none of the independent variable's collinearity statistics exceed the common cutoff threshold (i.e., variance inflation factor value  $\geq 10$ ; tolerance value  $\leq 0.1$ )(see the bottom part of Table 14), it is believed there is no collinearity among the independent variables.

$$\text{Model 1: ReviewUsefulness} = \beta_{11} \times \text{DayLapsed} + \beta_{12} \times \text{ReviewRating} + \beta_{13} \times \text{ReviewBreadth} + \beta_{14} \times \text{ReviewDepth} + \beta_{15} \times \text{PhotoPresence} + \beta_{16} \times \text{PhotoVolume} + \varepsilon_1$$

Model 1 is developed to examine the hypothesized relationships between the set of content-related characteristics and review usefulness (i.e., H1 to H4). As shown in the "Model 1" column of Table 15, Model 1 is a significant model which explains about 3 percent of the variance of review usefulness (Pseudo  $R^2 = 0.03$ , Log-Likelihood  $X^2 = 251.170$ ,  $p < 0.01$ ). Day lapsed, one of the two control variables in the model, has a weak but positive relationship with review usefulness ( $\beta_{11} = 0.001$ ,  $p < 0.01$ ). This result is in line with Li et al.'s (2013) conception of early bird bias (i.e., early published reviews tend to get more helpful votes). Review rating appears to have a negative relationship with review usefulness ( $\beta_{12} = -0.072$ ,  $p < 0.1$ ). In other words, negatively valenced reviews are likely to receive more helpful votes than positively valenced ones.

H1 postulates that review breadth has a positive impact on receivers' perceived usefulness of online hotel reviews. Though H1 is grounded on Daft and Lengel's (1986) theory as well as results from prior works, this hypothesis is not supported by the current findings because the negative coefficient of review breadth ( $\beta_{13} = -0.057$ ,  $p < 0.01$ ) suggests that for each one-unit increase on feature discussed in a review, the expect log count of helpful vote decreases by 0.057 unit. This suggests that reviews discussing less hotel-related features in the content are likely to receive more helpful votes than those covering more features. H2, which posits that review depth has a positive impact on receivers' perceived usefulness of online hotel reviews, is supported ( $\beta_{14} = 0.005$ ,  $p < 0.01$ ). This denotes that readers perceive longer reviews as more helpful, and they tend to give more helpful votes to longer reviews. Regarding the relationship between presence of pictorial elements in review content and review usefulness, concordant to H3, reviews with a photo/s are perceived to be more useful than those without a photo/s ( $\beta_{15} = 0.494$ ,  $p < 0.1$ ). Yet,

while the inclusion of a photo/s in a review can substantially increase its probability of acquiring more helpful votes from readers, the insignificant relationship between photo volume and review usefulness ( $\beta_{16} = -0.021$ ,  $p = 0.817$ ) unveils that providing more photos in a review will not help enhance its usefulness from readers' point of view.

**Model 2:** ReviewUsefulness =  $\beta_{21} \times \text{DayLapsed} + \beta_{22} \times \text{ReviewRating} + \beta_{23} \times \text{ReviewBreadth} + \beta_{24} \times \text{ReviewDepth} + \beta_{25} \times \text{PhotoPresence} + \beta_{26} \times \text{PhotoVolume} + \beta_{27} \times \text{Document-levelStyle} + \beta_{28} \times \text{Sentence-levelStyle} + \beta_{29} \times \text{ReviewReadability} + \varepsilon_2$

Adding three style-related characteristics into Model 1, Model 2 is primarily formulated to investigate the hypothesized relationships between the set of style-related characteristics and review usefulness (i.e., H5-H7). Model 2 accounts for about 5.3 percent of the variance of review usefulness (Pseudo  $R^2 = 0.053$ , Log-Likelihood  $X^2 = 255.376$ ,  $p < 0.01$ ), as Table 15 exhibits. Compared to Model 1, the Pseudo  $R^2$  of Model 2 increases by 2.3 percent after adding three style-related characteristics in the regression model. This implies that the inclusion of those style-related characteristics can improve the prediction of hotel review usefulness. Unlike what H5 and H6 hypothesized, the negative binomial regression results show that provider's choice of linguistic style does not affect how readers perceive the usefulness of the reviews. Compared to reviews using emotional language (i.e., baseline group for the variable "Document-level style"), hotel reviews using functional language are not perceived as more useful than those using emotional language ( $\beta_{27} = -0.064$ ,  $p = 0.668$ ). H5 is not supported, indicating that reviews with hyperboles or emotional statements would not pose positive or detrimental impact on their usefulness or diagnosticity. At the sentence level, the regression results report that reviews using comparative or/and suggestive sentences are not perceived to be more useful than those using descriptive sentences only (COM:  $\beta_{28} = 0.060$ ,  $p = 0.702$ ; SUG:  $\beta_{28} = -0.126$ ,  $p = 0.235$ ; COM + SUG:  $\beta_{28} = 0.143$ ,  $p = 0.604$ ). This is contrary to H6 and results presented in Qazi et al. (2016).

Despite the fact that document-level and sentence-level linguistic styles are insignificant predictors of review usefulness, the positive coefficient of review readability indicates that highly readable reviews are more likely to receive a greater number of helpful votes ( $\beta_{29} = 0.010$ ,  $p < 0.01$ ). One interesting finding worth noting is that the relationship between review rating and review usefulness becomes insignificant ( $\beta_{22} = -0.053$ ,  $p = 0.220$ ) after including style-related characteristics in the regression model. Since review rating represents the overall valence of the review, this implicitly signifies that review valence is no longer a crucial determinant affecting one's judgment of review helpfulness if the review text itself is highly readable. Still, since there is a lack of empirical evidence to verify this proposition, subsequent researchers are recommended to investigate this substitution effect in future studies.

$$\text{Model 3: ReviewUsefulness} = \beta_{31} \times \text{DayLapsed} + \beta_{32} \times \text{ReviewRating} + \beta_{33} \times \text{ReviewBreadth} + \beta_{34} \times \text{ReviewDepth} + \beta_{35} \times \text{PhotoPresence} + \beta_{36} \times \text{PhotoVolume} + \beta_{37} \times \text{Document-levelStyle} + \beta_{38} \times \text{Sentence-levelStyle} + \beta_{39} \times \text{ReviewReadability} + \beta_{310} \times \text{ReviewerExpertise} + \beta_{311} \times \text{ReviewerReputation} + \varepsilon_3$$

By adding two source-related characteristics on top of Model 2, Model 3 is developed with an aim of examining the suggested relationships between two source-related characteristics and review usefulness (i.e., H8-H9). The regression results show that Model 3 is a significant model, and it accounts for about 5.9 percent of the variance of review usefulness (Pseudo  $R^2 = 0.059$ , Log-Likelihood  $X^2 = 275.842$ ,  $p < 0.01$ ). Through incorporating two additional source-related characteristics in the regression model, Model 3 can explain an additional 2.9 percent valence of review usefulness (versus Model 1). Surprisingly, the regression results exhibit findings which is contrary to what H8 postulates. As shown in the “Model 3” column of Table 15, reviewer expertise has a negative relationship with review usefulness ( $\beta_{310} = -0.008$ ,  $p < 0.01$ ). This suggests that reviews contributed by reviewers with higher expertise are less likely to be perceived as helpful. However, alike what H9 proposed, reviewer reputation has a positive impact on receivers’ perceived usefulness of online hotel reviews ( $\beta_{311} = 0.011$ ,  $p < 0.01$ ). This result is in accordance with Racherla and Friske (2012), and this also shows that reviews written by reputable members in the community have a higher possibility to be recognized as helpful reviews.

To validate the predictive ability of the final model, Model 3 was re-tested using the holdout sample with 483 observations. As shown in the “Model 4” column of Table 15, the final model fits the holdout sample and it can explain 10.4 percent of the variance of review usefulness (Pseudo  $R^2 = 0.104$ , Log-Likelihood  $X^2 = 114.104$ ,  $p < 0.01$ ). The direction and strength of parameter estimates in Model 4 are largely similar to those in Model 3. Day lapsed ( $\beta_{41} = 0.001$ ,  $p < 0.01$ ), review depth ( $\beta_{44} = 0.004$ ,  $p < 0.01$ ) and reviewer reputation ( $\beta_{411} = 0.021$ ,  $p < 0.01$ ) have a positive impact on review usefulness, while the impact of review breadth ( $\beta_{43} = -0.076$ ,  $p < 0.01$ ) and reviewer expertise ( $\beta_{410} = -0.020$ ,  $p < 0.01$ ) on review usefulness are negative. However, presence of photo ( $\beta_{45} = 0.199$ ,  $p = .746$ ) and review readability ( $\beta_{49} = 0.003$ ,  $p = 0.628$ ) are not proven to be significant factors affecting holdout sample’s review usefulness.

To examine whether random error effect and ratio effect result into this deviation, the researcher attempted to use various ratios of analysis sample to holdout sample (e.g., 60%-40% and 70%-30%) for model estimation and validation. Interestingly, presence of photo and review readability were often found to be significant predictors in groups with big sample size but not in groups with small sample size. Drawing on these findings, the author cautiously concludes that the predictive ability of presence of photo and review readability is more pronounced when the size of review sample is big. Subsequent researchers are recommended to verify this proposition in future research.

TABLE 14. CORRELATION MATRIX AND COLLINEARITY STATISTICS OF ALL VARIABLES

Variables	1	2	3	4	5	6	7	8	9	10	11	12
<b>Correlation Coefficient <sup>a</sup></b>												
1. Review usefulness	1.000											
2. Day lapsed	0.273 **	1.000										
3. Review rating	-0.143 **	-0.117 **	1.000									
4. Review breadth	0.082 **	0.072 **	-0.069 **	1.000								
5. Review depth	0.247 **	-0.006	-0.221 **	0.623 **	1.000							
6. Presence of photo/s	-0.077 **	0.008	-0.010	-0.014	-0.066 **	1.000						
7. Volume of photo/s	0.078 **	-0.018	-0.004	0.044 *	0.106 **	-0.853 **	1.000					
8. Document-level style	0.069 **	-0.038 #	-0.022	0.011	0.190 **	-0.005	0.020	1.000				
9. Sentence-level style	-0.013	0.038 *	-0.045 *	-0.022	-0.116 **	0.057 **	-0.041 *	-0.054 **	1.000			
10. Review readability	0.064 **	0.026	-0.081 **	0.031 #	0.011	-0.019	0.025	-0.035 #	0.049 *	1.000		
11. Reviewer expertise	-0.048 *	0.030 #	-0.060 **	0.166 **	0.071 **	-0.007	0.005	-0.002	0.001	0.040 *	1.000	
12. Reviewer reputation	0.062 **	0.071 **	-0.090 **	0.209 **	0.184 **	0.000	0.007	0.029	-0.016	0.021	0.827 **	1.000
<b>Collinearity statistics</b>												
Variance inflation factor	-	0.965	0.912	0.570	0.512	0.271	0.270	0.942	0.971	0.987	0.304	0.297
Tolerance	-	1.037	1.097	1.756	1.954	3.688	3.704	1.062	1.030	1.013	3.293	3.368

Note: \*\* represents  $p < 0.01$ ; \* represents  $p < 0.05$ ; # represents  $p < 0.1$ .

TABLE 15. NEGATIVE BINOMIAL REGRESSIONS RESULTS

Variables <sup>a</sup>	Estimation <sup>b c</sup>				Validation <sup>b c</sup>	Full <sup>b c</sup>
	Null model	Model 1	Model 2	Model 3	Model 4	Model 5
<b>Control variables</b>						
Day lapsed	0.001 (0.0001) **	0.001 (0.0001) **	0.001 (0.0001) **	0.001 (0.0001) **	0.001 (0.0003) **	0.001 (0.0001) **
Review rating	-0.179 (0.0396) **	-0.072 (0.0420) #	-0.053 (0.0435)	-0.062 (0.0436)	-0.059 (0.0713)	-0.060 (0.0364) #
<b>Content-related variables</b>						
Review breadth		-0.057 (0.0166) **	-0.055 (0.0169) **	-0.047 (0.0172) **	-0.076 (0.0311) **	-0.055 (0.0149) **
Review depth		0.005 (0.0005) **	0.005 (0.0006) **	0.004 (0.0006) **	0.004 (0.0010) **	0.004 (0.0005) **
Review - with photo/s		0.494 (0.2831) #	0.492 (0.2847) #	0.609 (0.2894) *	0.199 (0.6143)	0.497 (0.2562) #
Review - without photo/s		-	-	-	-	-
Review (photo number)		-0.021 (0.0906)	-0.015 (0.0911)	-0.043 (0.0920)	-0.083 (0.2279)	-0.033 (0.0851)
<b>Style-related variables</b>						
Document-level style – Functional			-0.064 (0.1495)	-0.063 (0.1499)	-0.061 (0.2523)	-0.053 (0.1265)
Document-level style – Emotional			-	-	-	-
Sentence-level style – COM			0.060 (0.1558)	0.060 (0.1564)	0.335 (0.2410)	0.152 (0.1286)
Sentence-level style – SUG			-0.126 (0.1063)	-0.121 (0.1066)	-0.087 (0.1883)	-0.101 (0.0920)
Sentence-level style – COM + SUG			0.143 (0.2750)	0.094 (0.2761)	0.093 (0.5095)	0.100 (0.2402)

Sentence-level style – DES						
	-	-	-	-	-	-
Review readability	0.010 (0.0037) **	0.010 (0.0037) **	0.003 (0.0058)	0.008 (0.0031) **		
Source-related variables						
Reviewer expertise		-0.008 (0.0019) **	-0.020 (0.0049) **	-0.010 (0.0018) **		
Reviewer reputation		0.011 (0.0029) **	0.021 (0.0061) **	0.013 (0.0025) **		
(Intercept)	0.373 (0.1818)*	-0.418 (0.2144)*	-1.104 (0.3744) **	-1.041 (0.3757) **	-0.317 (0.6014)	-.847 (0.3132) **
Akaike's Information Criterion	3,753.753	3,648.167	3,572.438	3,555.972	1,187.655	4,728.310
Bayesian Information Criterion	3,769.591	3,685.123	3,635.522	3,629.570	1,245.704	4,805.894
Log-likelihood	-1,873.876	-1,817.084	-1,774.219	-1,763.986	-579.828	-2,350.155
Log-likelihood X <sup>2c</sup>	137.585 **	251.170 **	255.376 **	275.842 **	114.104 **	377.450 **
Pseudo R <sup>2</sup>	-	0.030	0.053	0.059	0.104	0.068
Δ Pseudo R <sup>2</sup> (vs. Model 1)	-	-	+ 0.023	+ 0.029	-	-
Observations	1,450	1,450	1,418	1,418	467	1,885

**Note:**

<sup>a</sup> **Sentence-level style – COM:** reviews using descriptive and comparative sentences; **Sentence-level style – SUG:** reviews using descriptive and suggestive sentences; **Sentence-level style – COM + SUG:** reviews using descriptive, comparative and suggestive sentences; **Sentence-level style – DES:** reviews using descriptive sentences only.

<sup>b</sup> Numbers reported in the cells are regression coefficient; Numbers reported in the parentheses are standard errors.

<sup>c</sup> \*\* represents  $p < 0.01$ ; \* represents  $p < 0.05$ ; # represents  $p < 0.1$ .

## 6 DISCUSSIONS AND IMPLICATIONS

### 6.1 Discussions

Considering that the exponential growth of online reviews poses a potential threat of information overload for information seekers, the identification of useful reviews and particularly factors affecting usefulness of online reviews has been becoming an unprecedentedly important research topic in recent years (Huang et al., 2015; Mudambi & Schuff, 2010; Pan & Zhang, 2011; Racherla & Friske, 2012; Salehi-Esfahani et al., 2016). Being one of the first studies attempting to examine the influence of both content-, style- and source-related characteristics on receivers' perceived usefulness of online hotel reviews, this study successfully develops a comprehensive review usefulness prediction model suited for online hotel reviews.

Harnessing negative binomial regression to analyze over 1,900 online hotel reviews, the findings of this research demonstrate that word-level information richness and topic-level information richness pose different impact on review usefulness. At the word level, this study reveals that longer reviews are generally perceived as more useful than shorter ones in the eyes of review readers. This is in accordance with Mudambi and Schuff's (2010) proposition as well as findings reported in multiple studies (e.g., Liu & Park, 2015; Yang et al., 2017). At the topic level, this study exhibits that reviews discussing more hotel-related features are found to be less useful than those covering less features. This is contrary to what this study postulates, and it can be explained by two possible reasons.

First, since leisure travelers are primary readers of online hotel reviews (Ady & Quadri-Felitti, 2015) and they often spend limited amount of time in the hotel during their vacation (except those staying in all-inclusive resort hotels), reviews covering ample and diversified hotel-related features tend to be unhelpful to them because some features discussed in the content are not of interest and relevance to them. Given that leisure travelers usually use fundamental facilities and services during their stay, reviews with detailed descriptions about fewer but core features (e.g., room cleanliness, breakfast quality) of the discussed hotels are considered as more helpful for them to understand whether the discussed hotels deserve to be chosen. The overwhelming cognitive effort needed for analyzing broad reviews is another possible reason explaining this contrasting finding. In theory, reviews covering various features of the discussed hotel can better help readers visualize the discussed property and specificize the experience. Yet, in practice, the act of reading broad reviewers requires readers to spend extra cognitive effort to comprehend its content and then facilitate the imagination (Orús, Gurrea & Flavián, 2016). Since readers now tend to spend limited amount of time to read and understand the content of reviews (Ady & Quadri-Felitti, 2015), the overwhelming cognitive effort needed for comprehending broad reviews might therefore induce readers to perceive this type of review as unhelpful.

Concordant to what this study proposed, this study empirically validates that perceived usefulness of online hotel reviews can be enhanced by including consumer-generated photos. In their previous study on blog articles, Lin et al. (2012) report that the presence of pictures in blog articles can enhance its credibility because pictures can reduce the uncertainty associated with online anonymity and provide tangible cues for substantiating the textual content. This study confirms and complements Lin et al.'s (2012) work by demonstrating that the inclusion of photo/s in reviews can further enhance their usefulness. While this study coins the significance of photo availability on hotel review usefulness, the current study reveals that providing more photos in a review cannot significantly improve the usefulness level of that review. As Yang et al. (2017) reports incongruent findings in their study on online restaurant reviews, this study calls for further research to confirm whether volume of photo/s in a review has a positive or negative impact on receivers' perceived usefulness.

Pertinent to those style-related characteristics, readability appears to have positive impact on review usefulness. This coincides with previous research (e.g., Korfiatis et al., 2012; Liu & Park, 2015) and provides additional evidence to the notion that highly helpful reviews contain more readable text than reviews that are less helpful. To another two characteristics, the empirical results of this study shows that both document-level and sentence-level linguistic styles are insignificant predictors of review usefulness. Reviews using functional language are not perceived as more useful than those using emotional language. Similarly, reviews using comparative or/and suggestive sentences are not perceived as more useful than those using descriptive sentences only. The possible reason for this result is that readers use linguistic styles as peripheral but not central cues due to information overload. As customers can now easily obtain online reviews from various portals for quality assessment and alternative evaluation, searching and reading multiple reviews before booking and purchasing is becoming a norm for customers (Ady & Quadri-Felitti, 2015). Given that a plethora of reviews are available but customers have limited information processing limit, they may thus utilize simple cues (i.e., readability) rather than those specifics (i.e., document- and sentence-level linguistic styles) in judging review usefulness. This indirectly explains why review readability is a significant factor affecting review usefulness.

Regarding those source-related characteristics, alike what this study postulated, reviewer reputation is proven to have a positive impact on receivers' perceived usefulness of online hotel reviews. Yet, in contrast to the commonly accepted notion that expertise enhances message credibility and persuasiveness (Belch & Belch 2011), one interesting finding of this study is that reviews contributed by reviewers with higher expertise are less likely to be perceived as helpful. The suspicious validity of expertise in the online context is one possible reason explaining this result. Willemsen, Neijens and Bronner (2012) propose and empirically verify that reviewers' self-presentations as experts make readers doubt the trustworthiness of their review content. As discussed in the literature review section, consumers often determine online reviewers' expertise based on the number of reviews they contribute in the past due to the absence of an



objective measure in the online community context. In TripAdvisor.com, a contributor's expertise level is also determined based on the volume and diversity of reviews they contributed to the portal (TripAdvisor, 2017b). Given that this form of reviewer expertise is not recognized by other members in the community but proclaimed by reviewers themselves, the expertise of these "self-proclaimed" experts is not convincing and readers are thus skeptical about the trustworthiness and usefulness of reviews contributed by those "self-proclaimed" experts.

## 6.2 Implications

From the theoretical standpoint, the current study contributes new knowledge to the growing stream of research on online reviews in two ways. First, this study is one of the first studies attempting to combine content-, style- and source-related characteristics into one model for predicting receivers' perceived usefulness of online hotel reviews. A plethora of prior studies have proven the significance of content-related and source-related characteristics (e.g., identity disclosure and reviewer expertise). This study complements those published works by validating the significant role of style-related characteristics in predicting review usefulness. Another research void, which is the paucity of research examining determinants affecting perceived usefulness of online hotel reviews, is also redressed by this study. To the best of the author's knowledge, this study is one of the limited works which purports to develop a comprehensive review usefulness prediction model suited for online hotel reviews. In spite of the fact that some characteristics are not empirically proven to be significant predictors of review usefulness, this study explicates the main and interactive effect of review content, review style and review source on readers' perceived usefulness of online hotel reviews. It therefore provides scholars with a radical solution to the question of "what makes a useful online hotel review".

Second, the empirical findings of this study also shed some lights to future studies on the topic of online review usefulness prediction. As exhibited in Table 15, day lapsed (representing the number of days a review has been available on the portal) is found to have a positive relationship with review usefulness in the current study. Considering that all reviews are not always equally visible to readers (Hu & Chen, 2016) and early published reviews tend to get more helpful votes (Fang et al., 2016; Racherla & Fiske, 2012), the impact of review visibility (e.g., day lapsed) has to be controlled accordingly otherwise the predictive accuracy will be hampered. At the content level, this study is the first one which investigates the individual impact of topic-level information richness (i.e., review breadth) and word-level information richness (i.e., review depth) on review usefulness. Since the empirical results show that review breadth and review depth pose differential impact on review usefulness, future research is advised to follow the approach of this study in order to accurately measure the individual impact derived from these two levels of information richness.

Besides contributing new knowledge to the literature, the research findings also provide hoteliers and other industry practitioners with practical clues in online review management. First, this study provides actionable tips for hoteliers in detecting useful reviews on TripAdvisor.com. As useful reviews are favored by readers and readers may pay more attention to the information and suggestions in those useful reviews, hoteliers need to quickly identify and analyze the content discussed in those useful reviews. If those useful reviews are negatively valanced (i.e., complaints), hoteliers should provide adequate response to the writers and rectify those problematic areas in a timely manner. Second, the findings of this study provide hoteliers with clues for guiding their customers in writing useful reviews. Hu and Chen (2016) suggest that the presence of useful reviews cannot only help review sites by gaining more traffic but also benefit product or service providers by having a fairer assessment on the discussed subject. Considering the significance of helpful reviews, an improving understanding about the characteristics of useful reviews can provide practitioners with clues for guiding their customers in writing useful reviews. Drawing on the analysis of over 1,900 reviews, this study successfully verify reviews which are likely to be perceived as helpful mostly: (1) discuss fewer aspects or features of the discussed hotels, (2) contain more text, (3) highly readable, (4) include photo/s (but not many) and (5) written by non-expert but reputable writers. Specifically, if hoteliers desire to have more helpful reviews on TripAdvisor.com, they should recommend their customers to provide detailed descriptions about several (but not many) features or service they experienced in the review content. They should also encourage their customers to attach one to two photos with their reviewers and proofread their text before submitting. Hoteliers are also advised to invite customers who are reputable members in TripAdvisor.com to contribute a review.

### **6.3 Limitations and future research**

Despite the significant contribution of the research findings, this study has some limitations which may restrict the extent to which the findings can be generalized. First, the results of this study are based on reviews published on TripAdvisor.com. Readers should generalize the findings to other consumer review sites (e.g, Yelp.com, Epinions.com and Qunar.com) with caution. Future research should include reviews from diversified consumer review sites for model testing in order to overcome this limitation. Second, this study used around two thousands English language hotel reviews to investigate the main and interactive impact of review content, review style and review source on receivers' perceived review usefulness. Although reviews on hotels in five different cities were included and a systematic method was used to collect a set of representative review samples (see section 4.1.1), the inclusion of small review samples (versus the 465 million reviews available in TripAdvisor.com) and the exclusion of reviews written in other languages (e.g., Chinese, German and Russian) for analysis limit the generalizability of the research findings.

Alike the suggestions given by studies on the similar topic, a natural extension of this study is to expand the size and source of review samples for model testing. Future research may attempt to test a model using reviews from two sources and compare the findings in a single study. The results may assist researchers and practitioners in understanding if readers' assessment of online review usefulness is site-dependent. Considering that the model developed in this model can explain around 10 percent of the variance of review usefulness, future research may consider adding property-related (e.g., star rating and brand affiliation) and other variables (e.g., review visibility, reader-writer similarity) in the prediction model in order to improve the understanding of "what makes a useful online hotel review". Last but not least, as highlighted in the conclusion of Racherla and Friske's (2012) study, using the number/s of helpful vote awarded to a review as the measure of review usefulness may be subject to under-reporting bias because the helpful vote count cannot capture the evaluation of review lurkers (i.e., those readers who read but not participate in voting). To redress this, future researchers should conduct primary research (e.g., experimental design) to investigate the impact of various characteristics on review usefulness.

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## STUDY 3: PREDICTING USEFULNESS OF ONLINE HOTEL REVIEWS: AN EXPERIMENTAL STUDY

### Abstract

With more tourism-related online review portals emerge, the usefulness of online reviews has been gradually becoming a matter of concern since the abundance of online reviews increase cognitive costs for travelers to process and judge review usefulness. Considering the pivotal role of readers' perceived usefulness of online reviews on readers' subsequent behavioral responses as well as the ultimate success of businesses' viral marketing strategy, this study aims to examine the impact of content-, style-, and source-related characteristics on readers' perceived usefulness and adoption intention of online hotel reviews. Drawing on the findings from a 2 x 2 x 2 x 2 between-subject experiment with 1,140 online hotel review readers, readers are found to rate perceived review content quality at a higher level when reviews are written using functional language. Review depth is found to have a positive impact on review content quality while no main effect is evident for review breadth. Regarding the impact of source-related characteristics on reviewer credibility, reviewer reputation is found to have a positive impact on reviewer credibility. Yet, the main effect of reviewer expertise as well as the moderating effect of perceptual homophily are not empirically proven. In line with Sussman and Siegal's (2003) Information Adoption Model, the results from the structural equation modelling show that both review content quality and reviewer credibility have a positive impact on review usefulness, and this may in turn positively affect readers' review adoption intention. Being one of the first studies using the experimental design approach to examine the impact of content-, style- and source-related characteristics on readers' perceived review usefulness and adoption intention, this study does not only enrich the theoretical understanding about the antecedents and consequences of review usefulness but also provide practitioners in the field with clues for improving their viral marketing efficacy.

### Keywords

Online reviews; review helpfulness; experiment; review content; review style; review source.

## 1 INTRODUCTION

Online reviews, as a new form of electronic word-of-mouth (eWOM), have been gradually becoming an indispensable information source for consumers. According to a survey by Salesforce (2016) with thousands of adults residing in the United States, 69% of respondents read online product reviews before purchasing a consumer goods. Barclays' (2016) latest report also reveals that consumers in the United Kingdom are increasingly reliant on online reviews to inform their brand selections and purchase decisions. Considering the high-priced, high-involvement and intangible nature of tourism products and services, it is no longer a secret that travelers collect online reviews early in the travel decision making process in order to minimize the risk of making a poor decision (Filieri & McLeay, 2014). PhoCusWright (2013) reports that the proportions of global travelers referencing online reviews before choosing a hotel and an attraction are as high as 77% and 44%, respectively. The consumer research by TrustYou (Ady & Quadri-Felitti, 2015) also shows that 95% of travelers read online hotel reviews before making their booking decisions. Around one third of leisure travelers in their study even claim that online reviews is one of the most critical factors for their decisions on hotel selection. In light of the increasing importance of online reviews on travelers' decision, scholarly attention towards various eWOM-related issues, such as factors motivating travelers to share reviews online (Munar & Jacobsen, 2014; Wu & Pearce, 2016), factors affecting travelers' intention to use online reviews for travel planning (Ayeh, Au & Law, 2013; Filieri & McLeay, 2014) and impact of online reviews on travelers' trip planning behavior (Sparks & Browning, 2011; Vermeulen & Seegers, 2009), have been increasing over the past few years.

Undoubtedly, the advent of online hotel reviews attenuates the negative effect derived from information asymmetry since travelers now have more information for assessing hotel quality and making choices. Yet, the sheer quantity of online reviews increases cognitive costs for travelers to process and judge the usefulness of various reviews. Sussman and Siegal (2003) posit that realizing receivers' perceived information usefulness is of importance because it is a fundamental predictor of their adoption predisposition. Since usefulness represents the instrumental value of the information, numerous studies corroborate that receivers will not consider adopting the information unless it is perceived as useful in performing their tasks (Casaló, Flavián & Guinalú, 2011; Cheung, Lee & Rabjohn, 2008). To identify reviews with high diagnostic value for consumers in making better purchase decision, the question of "what makes a useful online review" has been extensively researched in various contexts (e.g., Huang, Chen, Yen & Tran, 2015; Korfiatis, García-Bariocanal & Sánchez-Alonso, 2012; Li, Huang, Tan & Wei, 2013; Mudambi & Schuff, 2010; Pan & Zhang, 2011; Sen & Lerman, 2007).

In the tourism and hospitality fields, the question of "what makes a useful online review" has also attracted considerable attention from scholars given that online tourism reviews are continuously growing in both impact and size. Though much effort has been devoted to examine

determinants affecting perceived usefulness of online tourism reviews, extant studies primarily concern online attraction reviews or online restaurant reviews (e.g., Fang, Ye, Kucukusta & Law, 2016; Liu & Park, 2015; Park & Nicolau, 2015; Racherla & Friske, 2012). In spite of the fact that travelers often reference online reviews before choosing a hotel and online hotel reviews are ubiquitous on consumer review sites and online travel agencies' websites (e.g., 28% of reviews and opinions about Vienna on TripAdvisor.com are related to hotels), knowledge about the question of "what makes a useful online hotel review?" remains scarce and thereby warrants greater investigation.

In addition to the limited attention paid to online hotel reviews, previous researchers are found to explore the topic in a uniform fashion. Among all studies examining the question of "what makes a useful online review", a majority of them employ the approach of analyzing archival data retrieved from consumer review sites for validating how proposed antecedents influence the count of helpful votes (e.g., Amazon.com – Huang et al., 2015; Yelp.com - Racherla & Friske, 2012; TripAdvisor.com – Fang et al., 2016). On the contrary, primary research using attitudinal data from review readers is surprisingly scant. Pan and Zhang (2011, p. 610) note that helpful votes on review portals may contain systematic bias because advertisers can "plant" negative reviews on rival's products. Racherla and Friske (2012) also state that helpful votes may not an optimal surrogate of receiver's perceived usefulness due to the inability of capturing abstaining behavior. To redress this limitation, Pan and Zhang (2011) conclude their study by advising future researchers to investigate review usefulness in controlled environments. In the conclusion section of their study, Schindler and Bickart (2012) also highlight that experimental design shall be employed in future research on this topic since it can examine the causal relationship between review characteristics and review usefulness. While experimental designs are widely accepted as useful for generalizing theoretical effects of variables (Highhouse, 2009) and several calls for primary research were made to explore review usefulness, progress on this front can at best be characterized as gradual.

Besides the above two, the paucity of scholarly attention towards the impact of review style and particularly review linguistic style on receivers' assessment of review usefulness is another research void that is not adequately redressed in extant studies. In the context of online reviews, reviewers' opinions are often presented in written text and supplemented by ratings or/and other multi-media elements. Given that the content of online reviews is primarily textual-based while content and style in reviews are inherently inseparable, the way a review is written and the type of linguistic style used in review writing appears to have certain influence on receiver's perception towards the quality and usefulness of review content. Theories in social psychology have long posited that conversation style plays a pivotal role in shaping the impact of information contained in reviews (Gallois, 1994; Ireland & Pennebaker, 2010). Recently, researchers in the marketing field test and verify that choice of linguistic style has a substantial influence on

readers' post-reading affect and behavior (Kronrod & Danziger, 2012; Ludwig, de Ruyter, Friedman, Brügggen, Wetzels & Pfann, 2013). Though review linguistic style is proven to pose some impact on receivers' consequential behavior, its impact on receivers' perceived usefulness remains unclear.

Noticing the research voids identified above, this study aims to complement the growing stream of research on online reviews by investigating "how content-, style- and source-related characteristics individually and interactively affect readers' perceived review usefulness and adoption intention" based on a between-subject experiment. Hovland (1948, p. 371) states that social communication is "the process by which an individual transmit stimuli to modify the behavior of other individuals". Given that online reviews are one type of social communications working within a framework of "who says what in which form with what effect on the audience", from the theoretical standpoint, both review source (i.e., who says), review content (i.e., says what) and review style (i.e., which form) should be considered to explain the variation in receivers' evaluations of review usefulness and adoption intention (i.e., what effect on the audience). To provide an answer to this research question, a conceptual framework is proposed based upon Sussman and Siegal's (2003) theory of information adoption. Specifically, this study focuses on five review-related characteristics (i.e., review breadth, review depth, review linguistic style, reviewer expertise and reviewer reputation) which are identified based on a comprehensive review of literature. Based on the findings from a 2 x 2 x 2 x 2 x 2 between-subject experiment with online hotel review readers, this study contributes to the literature by exposing the antecedents and consequences of review usefulness.

The remaining sections of this study are organized as follows. Section 2 is an overview section that summarizes the methodological approaches used as well as the determinants of readers' perceived usefulness of online reviews discussed in previous research. After revising the literature, the conceptual framework and research hypotheses are introduced in Section 3, and followed by the presentation of details pertinent to the experiment conducted in this study (see Section 4). Findings from the experiment are then shown and discussed thoroughly (see Section 5), before presenting the conclusions, limitations and suggestions for future research.

## 2 PERCEIVED USEFULNESS OF ONLINE REVIEWS

Defined as “the degree to which a person believes that using a system would enhance his or her job performance” in Davis’ (1989, p. 320) Technology Acceptance Model (TAM), perceived usefulness is widely recognized as one of the two determinants which has a direct and positive on one’s attitude toward using a system and thereby their intention to use a system. Although the TAM and the concept of perceived usefulness are firstly introduced for explaining consumers’ adoption of information systems, Sussman and Siegal (2003) adapt the model to the domain of information transfer and confirm that TAM’s assertion can predict consumers’ information adoption behavior. According to the Information Adoption Model (IAM) developed in their seminal paper, Sussman and Siegal (2003) suggest that an individual’s perception of the usefulness of received advice is consequential in determining his/her adoption intention. Defined as the extent to which a receiver perceives a received advice to be useful in performing his or her tasks (Pan & Zhang, 2011), an individual’s perceived usefulness (or helpfulness) of an advice is influenced by its content quality and its source credibility. Content quality refers to the extent to which readers view the content of an advice as convincing or valid, while source credibility represents the extent to which readers view the provider as a credible source.

Along with the increasing number of reviews available online, the challenge of becoming difficult to identify useful or helpful information in this abundance of available sources provides a momentum for scholars and practitioners to examine perceived usefulness of online reviews. Indeed, thanks to the emergence of Internet technology in general and social media in particular, consumers now have more avenues to share personal knowledge, experience and opinions of travel and hospitality products and services. TripAdvisor.com recently announces that their portal documents more than 465 million reviews, covering over six million accommodations, restaurants and attractions (TripAdvisor, 2017). Yelp.com now provides more than 121 million consumer advices on multiple types of businesses (Yelp, 2017). From the receiver’s perspective, the proliferation of online reviews reduces their search cost since they can now easily obtain information for quality assessment and alternative evaluation. However, the abundance of online reviews increase reader’s cognitive loads because individuals generally have a limited capability to process a substantial amount of information in a given period of time (Frías, Rodriguez & Castañeda, 2008). Since receivers are incapable of analyzing all reviews available online, adding to their preference of adopting selective processing pattern (Gottschalk & Mafael, 2017), many researchers have endeavored to identify the characteristics of reviews which are perceived as more useful than others in the eyes of receivers.

Table 16 presents a summary of studies exploring determinants of readers’ perceived usefulness of online reviews. As indicated in Table 16, studies using panel data analysis are dominant and most studies primarily concern reviews for tangible products (e.g., Baek, Ahn & Choi, 2013; Forman, Ghose & Wiesenfeld, 2008; Korfiatis et al., 2012; Mudambi & Schuff, 2010; Weathers,

Swain & Grover, 2015). Harnessing the Tobit regression on 1,587 reviews from Amazon.com across six tangible products, Mudambi and Schuff (2010) find that reviews with extreme ratings are less helpful than those with moderating ratings. Using archival data from Amazon.com, Pan and Zhang (2011) report that review valence and review length have positive effects on helpfulness of product reviews but the effects are contingent upon the type of reviewed product (i.e., experiential vs. utilitarian product). Panel data analysis is also often used among studies focusing on reviews for intangible service (e.g., Fang et al., 2016; Park & Nicolau, 2015; Yang, Shin, Joun & Koo, 2017). Racherla and Friske (2012) propose a model examining how message factors (e.g., review elaborateness) and messenger factors (e.g., identity disclosure) influence usefulness of online reviews on three types of services. Using 3,000 reviews collected from Yelp.com as data source, the researchers report that reviews provided by reputable and expert reviewers are generally perceived as more useful. Liu and Park (2015) recently analyzed 5,090 reviews on Yelp.com in order to identify factors affecting perceived usefulness of online restaurant reviews. The findings derived from Tobit regression reveal that review readability and reader perceived enjoyment are significant determinants of readers' perception of review usefulness.

Several studies have attempted to investigate the impact of review-related characteristics on reader's perceived usefulness using experiments or questionnaire surveys. But still, primary research on this topic remains nebulous. Li et al. (2013) conduct an experimental study with an aim of unveiling how authorship (i.e., expert- or consumer-written) and content abstractness (i.e., concrete or abstract) of mobile phone and laptop computer reviews affect reader's review helpfulness. With the help of 127 working professionals, they report that consumers perceive customer-written product reviews as more helpful than those written by experts. In the same study, the researchers also report that a concrete review is rated as more helpful than an abstract review. Casaló, Flavián, Guinalú and Ekinci's (2015) study is one of the few cases which explore usefulness of reviews for tourism services using experiment. Based on the results from two experiments, they report that negative online reviews are perceived to be more useful than positive reviews, particularly for high risk-averse travelers. Casaló et al. (2015) also note that high risk-averse travelers will find positive online reviews more useful if the reviews are written by experts or include product pictures and brand names.

A diversified set of review-related characteristics has been examined in prior studies. As shown in Table 16, one stream of research has solely focused on content-related characteristics (e.g., Korfiatis et al., 2012; Mudambi & Schuff, 2010; Sen & Lerman, 2007). Sen and Lerman's (2007) study is an example of this stream, and that study attempts to examine the existence of negativity effect in consumer reviews on the web. Based on the results from two experiments on six tangible products, the researchers find negative reviews more useful than positive ones on average but product type (i.e., utilitarian or hedonic) would moderate the effect of review valence on review usefulness. Another example of this stream is Schindler and Bickart (2012), and they focus on stylistic factors of online reviews. Two interesting results are reported in Schindler and

Bickart's (2012) study. First, the length of a review is positively related to its perceived value. Second, reviews with a higher proportion of product-descriptive statements are more helpful for readers in decision making. Besides solely exploring the influence of content-related characteristics, another stream of studies incorporates both content- and source-related characteristics in the examination of review usefulness (e.g., Huang et al.; Salehi-Esfahani, Ravichandran, Israeli & Bolden, 2016; Weathers, Swain & Grover, 2015). As noted earlier, Racherla and Friske (2012) propose and test a model examining how message factors (e.g., review elaborateness) and messenger factors (e.g., identity disclosure) influence review usefulness based on reviews collected from Yelp.com. By integrating both quantitative aspect of review (e.g., word count) and qualitative aspects of reviewers (e.g., reviewer experience and reviewer impact), Huang et al. (2015) report that reviewer's cumulative helpfulness is a significant predictor of review helpfulness. Word count is a significant predictor of review helpfulness only when the length of a review is shorter than the average one.



TABLE 16. LIST OF SELECTED STUDIES EXPLORING FACTORS AFFECTING PERCEIVED USEFULNESS OF ONLINE REVIEWS

Author/s (Year)	Review product	Methodology (Data source)	Review characteristics <sup>a</sup>	Key findings
Sen and Lerman (2007)	10 tangible products (e.g., CDs, cell phones, PDAs)	Experiment (132 MBA students)	(C) Review valence	Readers perceive negative reviews as more helpful when hedonic products are evaluated. Yet, readers perceive positive reviews as more helpful when utilitarian products are evaluated.
Forman, Ghose and Wiesenfeld (2008)	Books	Analytical modelling (175,714 reviews from Amazon.com)	(C) Review equivocality (SO) Identity disclosure	Readers rate reviews containing self-descriptive information as more helpful than anonymous reviews. However, readers are less responsive to reviewer disclosure of identity-descriptive information when reviews are unequivocal than when reviews are equivocal.
Mudambi and Schuff (2010)	6 tangible products (e.g., MP3 players, PC video games and laser printers)	Analytical modelling (1,587 reviews from Amazon.com)	(C) Review extremity (C) Review length	Reviews with moderate ratings are more helpful than those with extreme ratings for experience goods but not for search goods. Review length has a greater positive effect on the helpfulness of review for search goods than for experience goods.
Pan and Zhang (2011)	6 tangible products (e.g., CDs, video games and computer softwares)	Analytical modelling (41,405 reviews from Amazon.com)	(C) Review valence (C) Review length (C) Review volume (SO) Reviewer innovativeness	Both review valence and review length have positive effects on review helpfulness, but the product type moderates these effects. Expressed reviewer innovativeness and perceived review helpfulness have an inverted-U-shaped relationship.
Korfiatis, García-Bariocanal and Sánchez-Alonso (2012)	Books	Analytical modelling (37,221 reviews from Amazon UK)	(C) Review rating (ST) Review readability	Review helpfulness is positively affected by its rating. Highly helpful reviews contain more readable text than those that are less helpful.

Racherla and Friske (2012)	Furniture stores, restaurants, and beauty & spas	Analytical modelling (3,000 reviews from Yelp.com)	(C) Review extremity (C) Review elaborateness (SO) Identity disclosure (SO) Reviewer expertise (SO) Reviewer reputation	Review extremity has a partially significant impact on review usefulness. Also, reviewer expertise and reputation are positively correlated with the perceived usefulness of reviews.
Schindler and Bickart (2012)	Books, and automobiles	Experiment (42 business school students)	(C) Valence of evaluative statements (C) Subject of descriptive statements (C) Proportion of statement (C) Number of statement	A review is more likely to be rated as valuable if it has a greater number of statements, a greater proportion of positive evaluative statements, a greater proportion of reviewer-descriptive statements, or a greater use of negative style characteristics.
Baek, Ahn and Choi (2013)	28 types of products (e.g., clothing, jewellery, and sports & outdoors)	Analytical modelling (75,226 reviews from Amazon.com)	(C) Rating inconsistency (C) Word count (C) Negative word percentage (SO) Reviewer ranking (SO) Reviewer real name	Review helpfulness becomes higher if the review rating is congruent with product average rating. A top-ranked reviewer's review generally has a higher level of review usefulness.
Li, Huang, Tan and Wei (2013)	Mobile phone, and laptop computer	Experiment (127 working professionals)	(C) Content abstractness (SO) Review authorship	Readers perceive customer-written product review as more helpful than those written by experts. Moreover, a concrete review is rated as more helpful than an abstract one.
Casaló, Flavián, Guinalú and Ekinici (2015)	Hotels	Experiment (257 customers of a Spanish online travel agency)	(C) Review valence (C) Presence of graphical content (SO) Reviewer expertise	To readers, negative reviews are perceived as more useful than positive reviews. However, positive reviews are more useful when performed by expert reviewers than non-expert reviewers. Besides, the inclusion of a picture of a travel product affect the perceived usefulness of a positive review to a greater extent when the travel product brand name is unknown.
Filieri (2015)	Accommodations, and restaurants	Questionnaire survey (354 online consumer review users)	(C) Information quality (C) Information quantity (C) Customer ratings (SO) Source credibility	Readers' perceived information diagnosticity is primarily influenced by the quality of information, cus-

				<p>customer ratings and overall rankings. Source credibility, however, has a limited impact on their perception of information diagnosticity.</p>
Huang, Chen, Yen and Tran (2015)	6 tangible products (e.g., CD, cameras, printers)	Analytical modelling (2,209 reviews from Amazon.com)	(C) Word count (SO) Reviewer experience (SO) Reviewer impact (SO) Cumulative helpfulness	Word count is a significant predictor of review usefulness when the review is shorter than average. For top reviewers, their cumulative helpfulness is a significant predictor of review helpfulness.
Liu and Park (2015)	Restaurants	Analytical modelling (5,090 reviews from Yelp.com)	(C) Review rating (C) Review elaborateness (ST) Review readability (SO) Reviewer expertise (SO) Reviewer reputation (SO) Identity disclosure	Reviewer reputation and identity disclosure have a significant impact on review usefulness. The level of review usefulness would also be higher if it has higher star rating, more words, easy and enjoyable to read from the reader's point of view.
Park and Nicolau (2015)	Restaurants	Analytical modelling (5,090 reviews from Yelp.com)	(C) Review valence (C) Review elaborateness (ST) Review readability (SO) Reviewer expertise (SO) Reviewer reputation (SO) Identity disclosure	Readers perceive reviews with extreme ratings as more useful and enjoyable than those with moderate ratings. Reviews are rated as more useful if they are longer and written by expert or reputable reviewers.
Weathers, Swain and Grover (2015)	8 tangible products (e.g., books, vacuum cleaners, and DVD players)	Analytical modelling (8,327 reviews from Amazon.com)	(C) Review balance (SO) Reviewer claim of expertise	Balanced reviews (with both positive and negative information) are perceived as more helpful by readers. Claiming expertise by citing direct experience or experience of others has a positive effect on review helpfulness.
Agnihotri and Bhattacharya (2016)	4 types of products (e.g., phone, camera)	Analytical modelling (1,608 reviews from Amazon.com)	(C) Review rating (ST) Review readability (ST) Review sentimental tone (SO) Reviewer experience (SO) Reviewer identity	Review readability and review sentimental tone follow curvilinear relationships with review helpfulness. When a review is written by an experienced reviewer, a higher percentage of consumers find the review helpful even though it is too easy to comprehend.

Fang, Ye, Kucukusta and Law (2016)	Attractions	Analytical modelling (41,061 reviews from TripAdvisor.com)	(C) Review rating (C) Review length (ST) Review readability (SO) Reviewer rating distance (SO) Reviewer rating distribution (SO) Reviewer experience	Reviews with higher level of readability and extreme sentiment generally have more helpful votes. Reviewers who stress the positive sides of the reviewed subject and have positive skewness (in terms of ratings) would receive more helpful votes.
Lee and Choeh (2016)	15 types of products (e.g., toy, music, DVD)	Analytical modelling (28,699 reviews from Amazon.com)	(C) Review depth (C) Review rating extremity (SO) Reviewer rank (SO) Identity disclosure	Reviewer reputation and review depth positively affect the helpfulness of an online product review. Review rating extremity and review depth are more positively related to helpfulness of reviews on search goods than on experience goods.
Salehi-Esfahani, Ravichandran, Israeli and Bolden (2016)	Restaurants	Experiment (302 students from a university in Ohio)	(C) Review extremeness (SO) Source credibility	Review extremity and source credibility are positively related to perceived information usefulness.
Yang, Shin, Joun and Koo (2017)	Hotels	Analytical modelling (1,158 reviews from TripAdvisor.com)	(C) Review rating (C) Review length (C) Review photo (SO) Reviewer location (SO) Reviewer level (SO) Reviewer helpful vote	Review rating and reviewer helpful vote attributes are the most important heuristics affecting review helpfulness. Review length, review photo and reviewer level are positively associated with review helpfulness but at a lesser extent.

**Note:** <sup>a</sup> (C) represents content-related characteristic; (SO) represents source-related characteristic; (ST) represents style-related characteristics.

## 3 RESEARCH MODEL AND HYPOTHESES

### 3.1 Content-related characteristics

#### 3.1.1 Review breadth

Defined as the number of product features covered by a review (Dong, Schaal, O'Mahony, McCarthy & Smyth, 2013), review breadth is indicative of the comprehensiveness of the review content (Bronner & de Hoog, 2011). Iacobucci and Ostrom (1993) suggests that a service offering can be conceptualized as combining a core component and other relational components. For instance, accommodation service can conceptually be broken down into a core component of a guestroom with bed/s together with other relational components like the provision of turn-down service and Internet access service. Since multiple components are involved in a service offering, travelers often assess and describe multiple components in their reviews. In a study on ratings and content of reviews on Expedia.com, Stringam and Gerdes (2010) report that the components mentioned by reviewers in their textual comments include but not limited to bed (e.g., sheet, pillow), bathroom (e.g., sink, shower), cleanliness (e.g., dirt and stain) and staff. The text mining study by Berezina, Bilgihan, Cobanoglu and Okumus (2016) also confirm that contributors of hotel reviews usually mention multiple features in their reviews (e.g., place of business, room, members and furnishing).

Qazi and colleagues (2016) argue and confirm that the number of features (or concepts) discussed in a consumer review is a key variable affecting its usefulness and persuasiveness. Indeed, given that the major reason why readers search for online reviews is to lower the risk of making a poor decision (Filieri & McLeay, 2014), reviews with greater scope is expected to be perceived as more convincing because they can better help readers assess various attributes of a service offering and thereby making informed purchase decisions. On the other hand, since a consumer review is theoretically an argument made by a reviewer to either persuade or dissuade other consumers from buying a product or service, the number of features described in a review is a proxy reflecting the richness of information that reviewer can offer to support his/her stance. Schwenk (1986) suggests that the persuasiveness of one's argument is positively associated with the comprehensiveness of information he or she can provide. Following Schwenk's (1986) notion, this study hypothesizes that:

***H1.** Hotel reviews with greater scope (as measured by the number/s of hotel-related feature/s discussed in reviews) are perceived to have a higher level of review content quality than those with lesser scope.*

### 3.1.2 Review depth

Referring to the amount of information available in a review, review depth (also known as review elaborateness or review length) is another content-related characteristic that may influence readers' thought on its persuasiveness and usefulness. The myth of "the longer review the better" is widely acknowledged among information seekers, and this myth is formed because of two reasons. First, given that longer reviews generally comprise more product descriptions as well as specifics about how and where the product is used in various contexts, longer product reviews are often found to be useful because their rich information can help readers reduce product quality uncertainty and allow them to picture themselves buying and using the product (Pan & Zhang, 2011). Second, review length signals the involvement of review providers (Racherla & Friske, 2012). As the providers of long reviews are usually more enthusiastic due to their very satisfactory or dissatisfactory experience with the subject under review, they may possess greater knowledge and are thus more likely to explicate all aspects pertinent to their usage experience in detail.

Several studies have investigated the relationship between review depth and review usefulness. Mudambi and Schuff's (2010) study empirically demonstrates that the length of reviews has a positive effect on the helpfulness of the review. The subsequent study by Pan and Zhang (2011) also reveals that review length has a positive effect on review helpfulness, but the product type moderates these effects. Daft and Lengel's (1986) uncertainty reduction theory posits that reviews with elaborate information tend to be more persuasive and useful than those with less information, since they can better help alleviate readers' uncertainty about product quality. Drawing on Daft and Lengel's (1986) contention as well as the findings from prior studies, the following hypothesis is postulated:

***H2.** Hotel reviews with greater amount of information (as measured by the number/s of word/s included in reviews) are perceived to have a higher level of review content quality than those with lesser amount of information.*

## 3.2 Style-related characteristics

### 3.2.1 Review linguistic style

Linguistic style used by the review writer is one of the style-related cues readers use in assessing value of review content (Gottschalk & Mafael, 2017; Li et al., 2013). Different from traditional word-of-mouth in the offline context, written texts are the primary medium providers of online reviews can use to describe their experience and express opinions on products or service in the

review portals. As the language and writing style in review writing may influence readers' interpretation of review content and even inference, it is essential to examine how review linguistic style affects readers' perception of persuasiveness and usefulness of review content.

Typically, review providers use either functionally-oriented language (hereinafter to be referred as functional language) or emotionally-oriented language (hereinafter to be referred as emotional language) in review writing (Noone & McGuire, 2013). Reviews using functional language would describe an experience in a descriptive and rational fashion (e.g., "*the guest room is very spacious*"). Reviews using emotional language would describe an experience in an affect-rich manner because writers would use metaphors, hyperboles and other idiomatic expressions to convey an additional connotation or reflect their emotions (e.g., "*the size of the guestroom makes me feel like royalty*"). According to Burgoon's (1995) language expectancy theory, emotional language is often used by individuals in intimate social relationships since it conveys high levels of affect intensity. On the contrary, functional language conveys rationality and formality. Its sense of straightforwardness make it more appropriate to be used in conversations among unfamiliar individuals. Burgoon's (1995) assertion garners some support from other researchers. Pan and Zhang (2011) state that reviews with many emotional statements may introduce idiosyncratic noises and therefore undermining their overall usefulness in informing readers about the quality of the reviewed product. Wu, Shen, Fan and Mattila (2017) recently examine and report that consumers exhibit less favorable attitudes and lower reservation intention after reading a emotional (versus functional) review compiled by an unknown individual.

Compared to emotional language, reviews using functional language tend to be more convincing since information are described in a factual-like and objective manner. Besides, readers require relatively less cognitive effort in interpreting the content in reviews using functional language. Based on these justifications, this study hypothesizes that:

**H3.** *Hotel reviews using functional language are perceived to have a higher level of review content quality than those using emotional language.*

### **3.3 Source-related characteristics**

#### **3.3.1 Reviewer expertise**

Being one of the two antecedents affecting credibility of an information source (Hovland, Janis & Kelley, 1953), classic literature on source effects generally establish that opinions by experts are more persuasive than non-expert (Petty, Cacioppo & Goldman, 1981). Bristor (1990, p. 73) state that expert's opinions are perceived as more credible and persuasive because "receivers have little motivation to check the veracity of the source's assertions by retrieving and rehears-

ing their own thoughts". Bansal and Voyer (2000) however argue that consumers are more inclined to seek advices from expert sources as experts often have greater knowledge about the reviewed topic and awareness about different alternatives available in the market.

Defined as the extent to which the information provider is perceived having knowledge or skill in the subject area of the message, receivers typically evaluate one's expertise based on his/her degree of knowledge, experience, skills or position of leadership (Hovland et al., 1953). In the online community, the objective measure to verify one's expertise in the area does not always exist. Due to the absence of objective measure, consumers generally assess the expertise of reviewers on the basis of their past behavior such as the number of the reviews written before and then form impression towards the reviewers (Dou, Walden, Lee & Lee, 2012). Although this practice is widely used in most online communities, many researchers criticize the validity of expertise in the online setting owing to the absence of identity verification mechanism in most online communities (Cheung et al., 2008; Dellarocas, 2006).

Though the validity of expertise in the online setting is difficult to be verified, the findings from academic research generally agree that recommendations from expert reviewers in the online community often provide more diagnostic and valuable information to readers in making better purchase decisions (Li et al., 2013; Park & Nicolau, 2015; Racherla & Riske, 2012; Yang & Mai, 2010). To verify the relationship between reviewer expertise and reviewer credibility in the online hotel review context, the following hypothesis is postulated:

**H4.** *Hotel reviews from providers with higher level of expertise (as measured by the number/s of review/s that providers contributed) are perceived to have a higher level of reviewer credibility than those from providers with lower level of expertise.*

### **3.3.2 Reviewer reputation**

Defined as the extent to which receivers believe a communicator is honest and concerned about others (Jarvenpaa, Tractinsky & Vitale, 2000), reputation is known to be another potential factor affecting how readers perceive the review providers as a credible source or not (Racherla & Friske, 2012). Guéguen and Jacob (2002) find that reputation of information sources creates higher compliance. Cialdini (2001) complies and notes that reputation effect is attributed to the phenomenon of social validation. In most reputation mechanisms adopted by consumer review sites, a reviewer's reputation is determined by the nomination or accreditation made by other members in the same community. Since one's reputation is recognized and validated by all members with the same interest, it is thus comprehensible why members in the opinion-sharing community often attend to the reviews contributed by more reputable reviewers (Ku, Wei & Hsiao, 2012).



Joshi, Sarker and Sarker (2007) suggest that recipients perceive content shared a less reputable source to be less persuasive and credibility. As source reputation and source credibility are theoretically relevant, a number of studies have examined the relationship between source reputation and source credibility. Xu (2014) conjectures and verifies that reputation cues generated by the computer system can induce a high level of consumer trust toward the source. Specifically, large number of trusted members would lead to more affective trust than small number of trusted members. Shan's (2016) experimental study also indicates that reviewers' reputation generated by a peer-rating system has positive influences on receivers' perceived trustworthiness and expertise. As previous studies generally demonstrate that source reputation determines readers' credibility judgement, the fifth hypothesis presumes that:

*H5. Hotel reviews from providers with higher level of reputation (as measured by the number/s of contributed review/s with helpful vote/s that providers received) are perceived to have a higher level of reviewer credibility than those from providers with lower level of reputation.*

### **3.3.3 Perceptual homophily**

Referring to the degree to which message providers and receivers are similar with respect to demographic (e.g., education level and social status) and/or psychographic characteristics (e.g., beliefs and values), homophily is widely recognized as a vital factor affecting how readers perceive providers as a credible source (Ayeh et al., 2013; Wang, Walther, Pingree & Hawkins, 2008). As introduced by Lazarsfeld and Merton (1954), the principle of homophily purports that human communication is more likely to occur when a provider and a receiver are alike. This notion is similar to Laumann's (1966) "like-me principle" which posits that people tend to trust and interact with others who are like themselves. Since homophilous individuals generally share similar values, perceptions, needs and wants than heterophilous counterparts, homophilous individuals are more likely to generate personally relevant and trustworthy product information (Aune & Kikuchi, 1993).

A plethora of researchers provide support for the applicability of homophily in the context of interpersonal communication. Brown and Reingen (1987) demonstrate that offline communication is more likely to be induced among homophilous individuals (in terms of age, sex and social status) than heterophilous individuals. Wang et al. (2008) also confirm that homophily drives both credibility and evaluation of online health information. In turn, evaluation of health information positively influences the likelihood to act on advice. In a study on travelers' intention to use consumer-generated media for travel planning, Ayeh et al. (2013) find and report that people evaluate the trustworthiness of eWOM sources more favorably if they perceive some level of congruence between their own interests and review contributors' interests.

Traditionally, the notion of homophily mainly describes similarity in terms of demographic characteristics (e.g., Gilly, Graham, Wolfinbarger & Yale, 1998). But since most of the demographic cues are lacking in the online setting, as suggested by Brown, Broderick and Lee (2007), recent conceptualizations of homophily refer more to shared interest and shared mind-set (i.e., perceptual homophily). Besides, though classic literature suggests that homophily is a direct antecedent affecting source credibility (e.g., Rogers & Bhowmik, 1970), Asada and Ko (2016) posit and demonstrate that homophily is more likely to moderate the impact of source-related characteristics on reader's credibility judgment. To illustrate, if a reader read two reviews which are written by reviewer A (who is a reputable/expert reviewer) and reviewer B (who is a reputable/expert reviewer and shares similar travel experience and preferences with the reader) individually, the reader is more likely to rate reviewer B as more credible due to the multiplicative function of reputation/expertise and homophily. In contrast, if a reader read two reviews by reviewer A (who is a reputable/expert reviewer) and reviewer B (who is a reputable/expert reviewer but shares dissimilar travel experience and preferences) individually, the reader is expected to rate reviewer A as more credible since the difference in interests and values might cause cognitive dissonance and thereby attenuate the credibility of reviewer A as well as his/her shared content. To verify the moderating effect of homophily in the online review setting, this study presumes that:

*H6. Perceptual homophily would moderate the impact of reviewer expertise and reviewer reputation on reviewer credibility – (6a.) The impact of reviewer expertise on reviewer credibility is stronger (weaker) when perceptual homophily is high (low); (6b.) The impact of reviewer reputation on reviewer credibility is stronger (weaker) when perceptual homophily is high (low).*

### **3.4 Review content quality, reviewer credibility, review usefulness and review adoption**

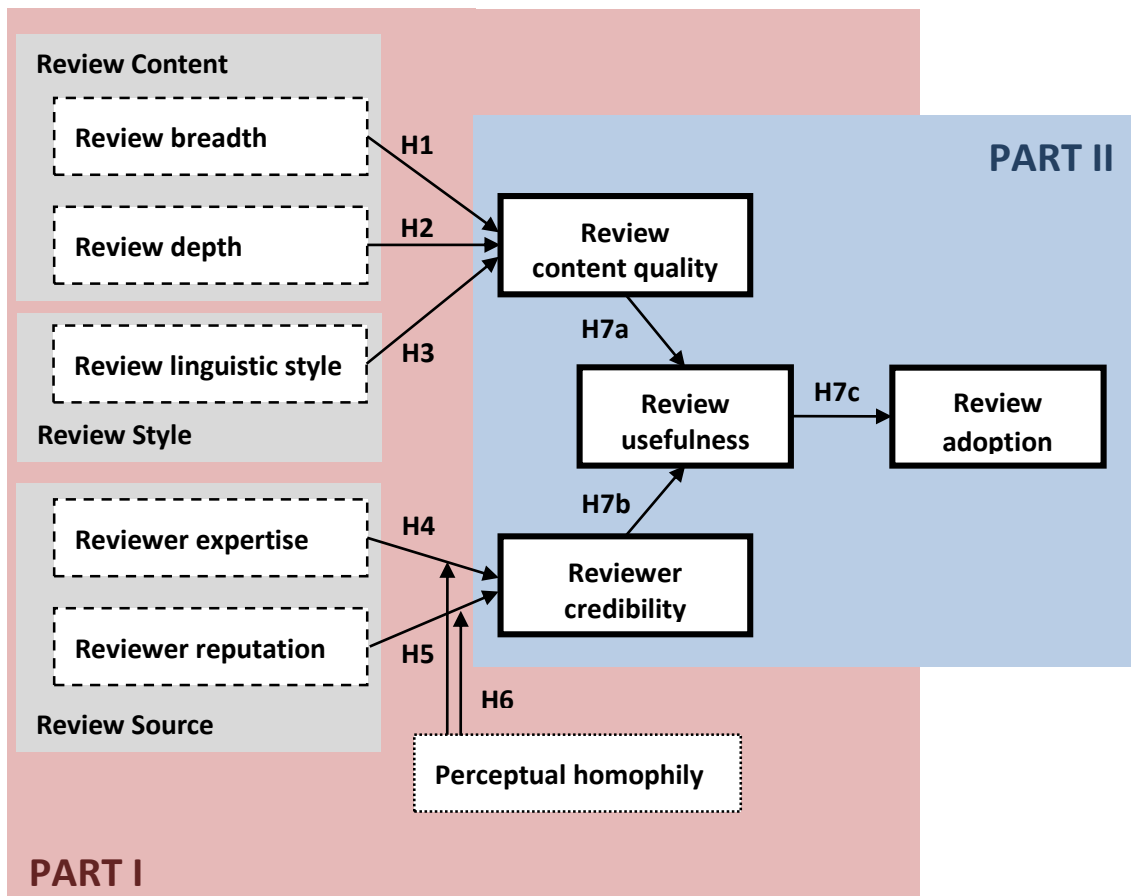
Adapted from Davis' (1989) TAM as well as Petty and Cacioppo's (1986) Elaboration Likelihood Model (ELM), Sussman and Siegal's (2003) IAM is formulated to explicate the internalization phase in which individuals accept information from external sources to enhance their knowledge or improve their decision making. Following TAM's notion that people form intentions to adopt a behavior or technology based on their beliefs about the consequences of adoption, the theorems of IAM are twofold: (1) an individual's intention toward adopting an advice or information is conditioned by his/her perceived usefulness of that advice or information; (2) argument quality and source credibility would directly affect receiver's perceived helpfulness of that advice or information.

Since it was developed in 2003, Sussman and Siegal's (2003) IAM have been extensively applied in various contexts. Numerous studies have also empirically verified the interrelationship among

information quality, source credibility, information usefulness and information adoption (e.g., Ayeh et al., 2013; Baek et al., 2013; Casalo, Flavián & Guinalú, 2011; Cheung et al., 2008; Filieri & McLeay, 2014; Filieri, 2015). Considering the proven robustness of IAM, the final three hypotheses of the conceptual framework (see Figure 4) follow the theorem of IAM and postulate that:

**H7.** (a) Review content quality has a positive impact on review usefulness; (b) Reviewer credibility has a positive impact on review usefulness; (c) Review usefulness has a positive impact on review adoption.

FIGURE 4. CONCEPTUAL FRAMEWORK OF STUDY 3



Notes: [---] represents the independent (manipulated) variables; [---] represents the moderator; [ ] represents the dependent (measuring) variables.

## 4 METHODOLOGY

To recap, the primary objective of this study is to provide an answer to the research question of “how content-, style- and source-related characteristics individually and interactively affect readers’ perceived review usefulness and adoption intention”. To attain this and test the hypotheses discussed in the previous section, a 2 x 2 x 2 x 2 x 2 between-subject experiment was conducted. In the following sub-sections, details pertinent to participants, procedures, stimulation material (with manipulation of independent variables), dependent variables and moderators, manipulation check, and data collection methods are going to be explicated.

### 4.1 Participants

The target population of the current study is all potential readers of online hotel reviews. The research subjects were recruited from a representative panel of Internet users from Qualtrics, an international research software and market research company. Since a total of 32 scenarios are included in this study (details about the scenario will be discussed in the sub-section 4.3) and each scenario needs an optimal number of 30 observations for validation (Lynn & Lynn, 2003), a minimum of 960 participants is therefore needed as valid samples.

The data collection was conducted in late-July 2017, a total of 1,525 members from the Qualtrics panel participated in the online experiment. Participants were randomly and equally assigned to one of the 32 treatment conditions in order to reduce the impact of extraneous variables that may have existed in the sample structure. After excluding those invalid cases (e.g., with substantial missing data; unreasonably completed the experiment within 30 seconds), 1,140 valid responses were received. Table 17 exhibit the number of participants in each of the 32 conditions.

**TABLE 17. NUMBER OF PARTICIPANTS IN EACH TREATMENT CONDITION**

<b>Review breadth</b>	<b>Review depth</b>	<b>Review linguistic style</b>	<b>Reviewer expertise</b>	<b>Reviewer reputation</b>	<b>Observations</b>
High	High	Functional	High	High	40
High	High	Functional	High	Low	33
High	High	Functional	Low	High	35
High	High	Functional	Low	Low	35
High	High	Emotional	High	High	36
High	High	Emotional	High	Low	35
High	High	Emotional	Low	High	37
High	High	Emotional	Low	Low	34

High	Low	Functional	High	High	33
High	Low	Functional	High	Low	36
High	Low	Functional	Low	High	33
High	Low	Functional	Low	Low	35
High	Low	Emotional	High	High	35
High	Low	Emotional	High	Low	36
High	Low	Emotional	Low	High	41
High	Low	Emotional	Low	Low	33
Low	High	Functional	High	High	35
Low	High	Functional	High	Low	36
Low	High	Functional	Low	High	34
Low	High	Functional	Low	Low	36
Low	High	Emotional	High	High	36
Low	High	Emotional	High	Low	36
Low	High	Emotional	Low	High	35
Low	High	Emotional	Low	Low	34
Low	Low	Functional	High	High	35
Low	Low	Functional	High	Low	31
Low	Low	Functional	Low	High	41
Low	Low	Functional	Low	Low	36
Low	Low	Emotional	High	High	37
Low	Low	Emotional	High	Low	35
Low	Low	Emotional	Low	High	39
Low	Low	Emotional	Low	Low	37
<b>Total</b>					<b>1,140</b>

## 4.2 Procedures

All participants accessed to an online questionnaire built on Qualtrics. Before commencing the main survey, participants firstly read details about the research background. Participant's eligibility to participate in the survey was then checked via answering two questions, which are "Have you ever participated in this survey before? [Yes/No]" and "Will you read any online hotel review in your upcoming trip-planning process? [Yes/No]" The first question is designed to exclude those who have participated in the study, because prior experience to the experiment or survey questions may affect the validity of their responses. The second question is designed to check if participants are potential readers of online hotel reviews, the target population of this study.

After confirming their eligibility, participants then read the hypothetical scenario of the study which is "Imagine that you are looking for a hotel at a city you plan to visit next year. When you

*search the information online, you visit a hotel review portal and find the following review.*" Prior studies suggest that participants' prior experience and knowledge about destinations, brands and source platforms may affect their judgment and responses (Chatterjee, 2001; Dou et al., 2012; Vermeulen & Seegers, 2009). To avoid potential bias and control the impact of external variables (e.g., brand familiarity, platform knowledge and platform experience), the names of destination, hotel and platform were not specified in the scenario.

Participants then read a piece of fictitious review on a hotel (details about the review will be discussed in the sub-section 4.3). Participants were then asked to answer a series of questions relating to review content quality, reviewer credibility, perceptual homophily, review usefulness and review adoption (details about the questions will be discussed in the sub-section 4.4). Afterwards, another six questions for manipulation check were asked (details about the questions will be discussed in the sub-section 4.5). To evaluate the perceived realism of the scenario, subjects were asked to answer two questions, which are "*The situation described in the scenario is realistic [1: Strongly disagree - 7: Strongly agree]*" and "*It is easy for you to imagine yourself in the scenario [1: Strongly disagree - 7: Strongly agree]*". In the last part of the survey, participants were asked to indicate their gender, age, level of reliance on online reviews before making a hotel booking and number of online reviews they read before making a hotel booking.

### **4.3 Stimulation material and manipulation of independent variable**

The stimulation material of this study is a set of fictitious hotel reviews to accommodate the manipulation of the selected independent variables. To control the impact of external variables, all aspects of the reviews (e.g., reviewer's profile photo, posted date and headline) remain identical apart from the manipulated variables.

Each manipulated variable has two levels. Review breadth is measured by the number/s of hotel-related feature/s discussed in reviews. To demonstrate an obvious difference between the two levels, reviews with greater scope discuss three features (i.e., guestroom, location and staff service) while reviews with lesser scope discuss one feature only (i.e., guestroom). These features are selected because they are the most frequently mentioned features in online hotel reviews (Berezina et al., 2016; Magnini, Crotts & Zehrer, 2011). Review depth is measured by the number/s of word/s included in reviews. Duverger (2013) found that customers generally write no more than 41 words per review. To create an evident difference, reviews with greater amount of information have around 100 words whereas those with lesser amount of information have around 30 words. Regarding the review linguistic style, wordings in reviews using functional language are more descriptive and factual-like (e.g., "*the guestroom is spacious*"). On the contrary, reviews using emotional language primarily comprise hyperboles and idiomatic

expressions (e.g., *“the guestroom is bigger than those in a palace”*). Appendix I shows the list of review text used in the stimulation material.

Reviewer expertise is measured by the number/s of review/s which providers contributed in the past. To providers with higher level of expertise, their profile has an “expert reviewer” badge and it indicates that they contribute 40 reviews before. The profile of providers with lower level of expertise does not have an “expert reviewer” badge and it indicates that they contribute 4 reviews before. Regarding the last variable, reviewer reputation is measured by the number/s of contributed review/z with helpful vote/s that providers received before. To those reputable reviewers, all reviews they contributed are indicated as helpful views and a “reputable reviewer” badge is also shown in their profile. To those non-reputable reviewers, only one-fourth of reviews they contributed are rated as helpful reviews and no “reputable reviewer” badge is presented in their profile. Considering that five manipulated variables are included in this study and each variable has two levels, there are a total of 32 combinations.

To simulate the realistic conditions, the content of the reviews were adapted from authentic reviews posted on consumer review sites. Two senior academics and three graduate students were invited to review the stimulation material to ensure its validity. Appendix II exhibits four sample reviews used in the experiment.

#### **4.4 Dependent variables and moderator**

Four dependent variables and one moderator are measured on the basis of well-validated statements which are extracted from prior studies. Review adoption was measured based on three statements adapted from Tseng and Wang (2016). The seven-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree) was used as a response scale, and the Cronbach’s alpha value of this variable is 0.948. Review usefulness was measured drawing on three statements adapted from Qiu, Pang and Lim’s (2012) as well as Sussmen and Siegal’s (2003) studies. The seven-point semantic differential scale was used and its alpha value is 0.966.

Harnessing the seven-point semantic differential scale as a response scale, review content quality was measured based on four statements adapted from Cheung, Luo, Sia and Cheng’s (2009) study while reviewer credibility was measured based on four statements from Sussman and Siegal’s (2003) study. The alpha values of review content quality and reviewer credibility are 0.908 and 0.903, respectively. Perceptual homophily, the moderator of expertise and reputation on reviewer credibility, was measured based on four statements from Lee and Watkins’ (2016) study using the 7-point Likert scale (1: Strongly disagree; 7: Strongly agree). The Cronbach’s alpha value of perceptual homophily is 0.955. Table 18 lists all measurement items and Cronbach’s alpha of all latent variables.

TABLE 18. LIST OF VARIABLES AND MEASUREMENT ITEMS IN STUDY 3

Variable / Measurement item	Alpha
<b>Review content quality</b> (Source: Cheung, Luo, Sia & Cheng, 2009) The content in this review is (1: <i>Incomplete</i> – 7: <i>Complete</i> ). The content in this review is (1: <i>Inconsistent</i> – 7: <i>Consistent</i> ). The content in this review is (1: <i>Not convincing</i> – 7: <i>Convincing</i> ). The content in this review is (1: <i>Not persuasive</i> – 7: <i>Persuasive</i> ).	0.908
<b>Reviewer credibility</b> (Source: Sussman & Siegal, 2003) The writer of this review is (1: <i>Not knowledgeable</i> – 7: <i>Knowledgeable</i> ). The writer of this review is (1: <i>Not an expert</i> – 7: <i>An expert</i> ). The writer of this review is (1: <i>Not trustworthy</i> – 7: <i>Trustworthy</i> ). The writer of this review is (1: <i>Not reliable</i> – 7: <i>Reliable</i> ).	0.903
<b>Review usefulness</b> (Source: Qiu, Pang & Lim, 2012; Sussmen & Siegal, 2003) Overall, this review is (1: <i>Not valuable at all</i> – 7: <i>Very valuable</i> ). Overall, this review is (1: <i>Not useful at all</i> – 7: <i>Very useful</i> ). Overall, this review is (1: <i>Not helpful at all</i> – 7: <i>Very helpful</i> ).	0.966
<b>Review adoption</b> (Source: Tseng & Wang, 2016) When you decide which hotel you would stay, you would consider the information and suggestions made by this review. <sup>a</sup> When you decide which hotel you would stay, you would adopt the information and suggestions made by this review. <sup>a</sup> When you decide which hotel you would stay, you would follow the suggestions made by this review. <sup>a</sup>	0.948
<b>Perceptual homophily</b> (Source: Lee & Watkins, 2016) The writer of this review thinks like you. <sup>a</sup> The writer of this review is similar to you. <sup>a</sup> The writer of this review is like you. <sup>a</sup> The writer of this review shares your values. <sup>a</sup>	0.955

**Note:** <sup>a</sup> 7-point Likert scale (1: Strongly disagree – 7: Strongly agree) was used as a response scale.

#### 4.5 Manipulation check

The five manipulated variables were checked with participants using multiple items. First, review breadth was checked by asking participants to rate their level of agreement with the statement “Based on the number of features it covers, the comprehensiveness of information available in this review is high. [1: Strongly disagree – 7: Strongly agree]”. Another statement, which is “Based on the number of words it includes, the amount of information available in this review is high. [1: Strongly disagree – 7: Strongly agree]”, was asked to check the manipulation of review depth. Two statements were used to check the manipulation of review linguistic style. The first one is “The writer of this review described his/her experience using descriptive words only. [1:



*Strongly disagree – 7: Strongly agree]*” and the second one is *“The writer of this review described his/her experience using metaphors and idiomatic expressions [1: Strongly disagree – 7: Strongly agree]”*. The checking of reviewer expertise and reputation was based on two questions. The first question is *“Based on the number of reviews he/she contributed before, the expertise of the writer of this review is high [1: Strongly disagree – 7: Strongly agree].”*, and the second one is *“Based on the ratio of his/her contributed reviews with helpful vote, the reputation of the writer of this review is high [1: Strongly disagree – 7: Strongly agree]”*.

## 4.6 Data collection

Before administering the main survey, the survey instrument was reviewed by three graduate students and a senior academic major in electronic marketing to ensure the accuracy and face validity. A pre-test was also conducted in mid-July 2017 with 88 undergraduate students prior to the main survey. The tasks included in the pre-test included assigning participants to various conditions, soliciting feedback on clarity of the task and the stimulation materials, as well as examining the strength of manipulations. Besides making some amendment in wordings, participants generally agreed that the task and stimulation materials are clear.

The pre-test results verified the strength of almost all manipulations (see Table 19). The outcome of insignificant difference between the average ratings on the statement *“The writer of this review described his/her experience using descriptive words only”* given by readers reading reviews using functional language and those reading reviews using emotional language is deemed to be understandable. The primary reason is that both groups of reviews include some sentences written in descriptive manner (see Appendix I). But still, the significant difference between the average ratings on the statement *“The writer described his/her experience using metaphors and idiomatic expressions”* given by readers reading reviews using functional language and those reading reviews using emotional language ( $t = -5.374$ ,  $p < 0.001$ ;  $Mean_{EMO} = 5.28$ ;  $Mean_{FUN} = 3.40$ ) confirms that the design effectively creates a successful manipulation.

Regarding the implementation plan of the main survey, as noted earlier, participants were recruited through the Qualtrics panel. In late-July 2017, Qualtrics assisted in forwarding the link to the online questionnaire (URL: [https://survey.eu.qualtrics.com/jfe/form/SV\\_dch0ZrSH-vMdzQnX](https://survey.eu.qualtrics.com/jfe/form/SV_dch0ZrSH-vMdzQnX)) to the recruited participants. For those who agreed to participate, they accessed and completed the questionnaire via the Qualtrics’ portal. A total of 1,525 Qualtrics panel members participated in the online experiment, and 385 invalid cases (e.g., with substantial missing data; unreasonably completed the experiment within 30 seconds) were discarded. Among those 1,140 valid responses, 52.3% were female and 47.7% were male. Most were aged 26-35 ( $n = 367$ , 32.2%) and followed by 36-45 ( $n = 233$ , 20.4%). According to their response to the statement *“Before making a hotel booking, you rely on online reviews ... [1: Not at all – 7: Very much]”*, the

participants of this study tend to rely on online reviews before making a hotel booking (mean = 5.00, SD = 1.023). On average, they read approximately ten reviews (mean = 10.85; SD = 12.116) before making a hotel booking. The demographic profile of all participants was shown in Appendix III.

TABLE 19. MANIPULATION CHECKS FOR THE PRE-TEST

Variable	Level	n	Mean	SD	t	p-value
<b>DV: The comprehensiveness of information available in this review is high</b>						
Review breadth	High	44	5.16	1.446	-3.166	< 0.001
	Low	44	4.11	1.646		
<b>DV: The amount of information available in this review is high</b>						
Review depth	High	44	5.27	1.468	-5.202	< 0.001
	Low	44	3.50	1.719		
<b>DV: The writer described his/her experience using descriptive words only.</b>						
Review linguistic style	Functional	48	4.90	1.462	1.625	0.108
	Emotional	40	4.35	1.688		
<b>DV: The writer described his/her experience using metaphors and idiomatic expressions.</b>						
Review linguistic style	Functional	48	3.40	1.594	-5.374	< 0.001
	Emotional	40	5.28	1.679		
<b>DV: The expertise of the writer of this review is high.</b>						
Reviewer expertise	High	47	5.56	1.501	-4.994	< 0.001
	Low	41	3.87	1.650		
<b>DV: The reputation of the writer of this review is high.</b>						
Reviewer reputation	High	45	5.36	1.654	-4.191	< 0.001
	Low	43	3.91	1.586		

## 5 FINDINGS AND DISCUSSIONS

### 5.1 Manipulation check and perceived realism

Prior to the main analysis, several ANOVA tests were firstly conducted using IBM SPSS 24 in order to investigate whether the manipulations of independent variables are successful as well as to identify the existence of confounding effects. As depicted in Table 20, the 2 (review breadth: high or low) x 2 (review depth: high or low) ANOVA test shows that review breadth has a main effect on the breadth manipulation check item ( $F = 102.919$ ,  $p < 0.001$ ,  $\omega^2 = 0.042$ ) and the mean value is significantly higher in the high breadth group versus the low breadth group ( $M_{\text{HIGH-BREADTH}} = 5.300$ ;  $M_{\text{LOW-BREADTH}} = 4.368$ ). Though there is potential for review depth to confound the manipulation check of review breadth, it is deemed that confounding is not a concern because the effect size of review depth is low and comparatively smaller than that of manipulated variable. To the impact on the depth manipulation check item, another 2 x 2 ANOVA test result shows that review depth has a main effect on the depth manipulation ( $F = 167.404$ ,  $p < 0.001$ ,  $\omega^2 = 0.068$ ;  $M_{\text{HIGH-DEPTH}} = 5.479$ ;  $M_{\text{LOW-DEPTH}} = 4.261$ ) and no confounding effect is identified.

Alike the pre-test result, there is no significant difference between the average ratings on *“The writer of this review described his/her experience using descriptive words only”* given by readers reading reviews using functional language and those reading reviews using emotional language ( $F = 0.562$ ,  $p = 0.453$ ;  $M_{\text{FUNCTIONAL}} = 4.858$ ;  $M_{\text{EMOTIONAL}} = 4.789$ ). Yet, the manipulation can still be considered as successful in view of the significant difference between the average ratings on the statement *“The writer described his/her experience using metaphors and idiomatic expressions”* given by readers reading reviews using functional language and those reading reviews using emotional language ( $F = 118.720$ ,  $p < 0.001$ ;  $\omega^2 = 0.040$ ;  $M_{\text{FUNCTIONAL}} = 3.830$ ;  $M_{\text{EMOTIONAL}} = 4.917$ ). With regards to the manipulation of reviewer expertise and reputation, the ANOVA test results exhibit that reviewer expertise has a main impact on the expertise manipulation check item ( $F = 9.758$ ,  $p < 0.01$ ,  $\omega^2 = 0.004$ ;  $M_{\text{HIGH-EXPERTISE}} = 4.819$ ;  $M_{\text{LOW-EXPERTISE}} = 4.520$ ). Reviewer reputation is also found to have a main influence on the reputation manipulation check item ( $F = 16.846$ ,  $p < 0.001$ ,  $\omega^2 = 0.007$ ;  $M_{\text{HIGH-REPUTATION}} = 4.963$ ;  $M_{\text{LOW-REPUTATION}} = 4.583$ ). Potential confounding effect is identified but they are not a concern because the effect sizes of manipulated variables are higher than those of confounding variables.

Regarding the perceived realism of the scenario, the findings of the one-sample t-test show that participants largely agreed *“The situation described in the scenario is realistic”* ( $t = 26.881$ ,  $p < 0.001$ ;  $M = 5.28$ ,  $SD = 1.612$ ). Another one-sample t-test result also reveals that the description and review were easy for participants to imagine themselves in the scenario ( $t = 26.326$ ,  $p < 0.001$ ;  $M = 5.25$ ,  $SD = 1.608$ ).

TABLE 20. MANIPULATION CHECKS IN THE MAIN SURVEY

Variable	Level	n	Mean	SD	F	p-value	$\omega^2$ <sup>a</sup>
<b>DV: The comprehensiveness of information available in this review is high</b>							
Review breadth (manipulation)	High	567	5.300	0.065	102.919	< 0.001	0.042
	Low	573	4.368	0.065			
Review depth (confounding)	High	567	5.057	0.065	23.597	< 0.05	0.009
	Low	573	4.611	0.065			
<b>DV: The amount of information available in this review is high</b>							
Review depth (manipulation)	High	567	5.479	0.067	167.404	< 0.001	0.068
	Low	573	4.261	0.066			
Review breadth (confounding)	High	567	4.939	0.067	2.107	0.147	0.001
	Low	573	4.802	0.066			
<b>DV: The writer described his/her experience using descriptive words only.</b>							
Review linguistic style	Functional	576	4.858	0.064	0.562	0.453	0.001
	Emotional	564	4.789	0.065			
<b>DV: The writer described his/her experience using metaphors and idiomatic expressions.</b>							
Review linguistic style	Functional	576	3.830	0.070	118.720	< 0.001	0.040
	Emotional	564	4.917	0.071			
<b>DV: The expertise of the writer of this review is high.</b>							
Reviewer expertise (manipulation)	High	565	4.819	0.068	9.758	< 0.01	0.004
	Low	575	4.520	0.067			
Reviewer reputation (confounding)	High	582	4.786	0.067	5.838	< 0.05	0.002
	Low	558	4.554	0.068			
<b>DV: The reputation of the writer of this review is high.</b>							
Reviewer reputation (manipulation)	High	582	4.963	0.065	16.846	< 0.001	0.007
	Low	558	4.583	0.066			
Reviewer expertise (confounding)	High	565	4.935	0.066	12.296	< 0.001	0.005
	Low	575	4.611	0.065			

Note: <sup>a</sup>  $\omega^2$  (omega squared) represents the effect size.

## 5.2 Hypothesis testing (Part I)

### 5.2.1 Review content quality

To examine the impact of content- and style-related characteristics on review content quality (i.e., H1-H3), a 2 (review breadth: high or low) x 2 (review depth: high or low) x 2 (review linguistic style: functional or emotional) ANOVA test was conducted. According to Fields (2009), this analytical approach is deemed to be appropriate since all three required conditions are fulfilled: (1) there are three independent variables (i.e., review breadth; review depth; review linguistic

style); (2) there is only one dependent variable (i.e., review content quality); (3) some independent variables use the same participants whereas others use different participants.

ANOVA test results show that no main effect is evident for review breadth ( $F = 2.299$ ,  $p = 0.130$ ). This represents that the perceived content quality of hotel reviews with greater scope is not significantly higher than those with lesser scope ( $M_{\text{HIGH-BREADTH}} = 5.656$ ,  $SD = 0.055$ ;  $M_{\text{LOW-BREADTH}} = 5.539$ ,  $SD = 0.054$ ). Two possible reasons can partially explain this contrasting result. As noted in section 4.3, reviews with higher breadth discuss three features (including guestroom, location and staff service) while reviews with lower breadth discuss guestroom only. Since guestroom is the core offering of hotels (Berezina et al., 2016; O'Connor, 2010) and hotel-staying guests often spend most of the time in their guestrooms, the description of guestroom is of utmost importance to reviewer readers. Given that the importance of guestroom related information is potentially higher than that of location and staff service, the provision of description about hotel location and staff service may thus not significantly induce reader to rate review content quality at a higher level. Another possible explanation for this finding is that the review text shown in both high breadth and low breadth groups are of equal level of readability. As expounded in Korfiatis et al. (2012) and Krishnamoorthy (2015), readability of review content is an important linguistic characteristic affecting readers' perception and assessment of review content quality. Given that Flesch Reading Ease indices of the review text shown in both groups range from 57 to 83.9 (i.e., the content is comprehensible by 13- to 15-year-old students; Flesch, 1951), the equal level of readability may thus induce readers to give similar review content quality ratings to both high breadth and low breadth groups.

Though H1 is not supported in this study, a significant main effect of review depth on review content quality is identified ( $F = 103.033$ ,  $p < 0.001$ ,  $\omega^2 = 0.022$ ). Alike what H2 postulates, readers' ratings of review content quality are higher when longer reviews are shown ( $M_{\text{HIGH-DEPTH}} = 5.988$ ,  $SD = 0.055$ ) than when shorter reviews are shown ( $M_{\text{LOW-DEPTH}} = 5.206$ ,  $SD = 0.054$ ). H2 is supported, denoting that hotel reviews with greater amount of text are perceived to have a higher level of review content quality than the counterpart with lesser amount of text. This also provides empirical evidence to Huang et al.'s (2015) proposition that the increase in word count would increase both quantity and quality of information. Review linguistic style is also found to have a significant main effect on review content quality ( $F = 10.541$ ,  $p < 0.01$ ,  $\omega^2 = 0.002$ ), but its effect is not as strong as review depth. Specifically, readers rate perceived review content quality at a higher level when reviews are written using functional language ( $M_{\text{FUNCTIONAL}} = 5.722$ ,  $SD = 0.054$ ) than when reviews are written using emotional language ( $M_{\text{EMOTIONAL}} = 5.472$ ,  $SD = 0.055$ ). This result does not only empirically support H3, but also demonstrate that the inclusion of hyperboles and idiomatic expressions in the review text may undermine its content quality.

### 5.2.2 Reviewer credibility

The influence of source-related characteristics on reviewer credibility (i.e., H4-H6) was examined based on another 2 (reviewer expertise: high or low) x 2 (reviewer reputation: high or low) x 2 (perceptual homophily: homophilous or heterophilous) ANOVA test. As expounded in section 4.4, the variable of perceptual homophily was not manipulated but measured directly in this study. Hence, the task of classifying participants into homophilous and heterophilous source drawing on participants' ratings on those homophily-related items has to be conducted before the ANOVA test. In order to identify a representative composite measure of perceptual homophily, following Hair, Black, Babin and Anderson (2010), the factor score (which is computed based on factor loadings of all measurement items under the variable of perceptual homophily) of each participant's perceptual homophily was firstly computed using the exploratory factor analysis. K-Means cluster analysis was then used to classify the participants into either homophilous source group (n = 685) or heterophilous source group (n = 455) according to their corresponding factor scores. To verify the accuracy of the classification result, an independent-sample t-test was conducted and the result showed that homophilous source group's averaged factor score is significantly higher than heterophilous source group's one ( $t = -49.693$ ,  $p < 0.001$ ;  $Mean_{HOMOPHILOUS} = 0.674$ ,  $Mean_{HETEROPHILOUS} = -1.015$ ).

The ANOVA test results show that H4 is not supported because no main effect is evident for reviewer expertise ( $F = 1.862$ ,  $p = 0.173$ ). This is contrary to the findings presented in previous studies (e.g., Park & Nicolau, 2015; Yang & Mai, 2010) and this might be attributed to dubious validity of expertise in consumer review sites. Considering that the antecedents used to determine source credibility (e.g., expertise and similarity) do not always exist in the online content, Hudson and Thal (2013) note that eWOM receivers encounter greater difficulty in judging the credibility of the source of reviews. Due to the absence of an objective measure in the online community context, Brown et al. (2007) suggest that the expertise of a reviewer on a review site are often drawn from what he/she discloses in the profile (e.g., contributed 30 hotel reviews before) and review content (e.g., *"I have stayed in dozens of 5-star hotels around the world ..."*). Although this practice is commonly used in consumer review sites like Amazon.com and TripAdvisor.com, this type of expertise is self-declared and no governance mechanism is in place to verify its legitimacy (Willemsen, Neijens & Bronner, 2012). Since the expertise of these "self-declared" experts is not recognized by administrators or other members in the community, this type of expertise is considered as dubious and the increment in reviewer expertise (via contributing more reviews to the portal or community) is therefore not manifested to improve readers' perception of reviewer credibility.

While reviewer expertise was proven to have no main impact on reviewer credibility, there is a significant main effect of reviewer reputation on reviewer credibility ( $F = 3.831$ ,  $p < 0.1$ ,  $\omega^2 = 0.0006$ ). In spite of the small effect size, the post hoc test reveals that readers rate reviewer

credibility at a higher level when reviews are written by highly reputable members ( $M_{\text{HIGH-REPUTATION}} = 5.018$ ,  $SD = 0.043$ ). In contrast, readers rated reviewer credibility at a relatively lower level when reviews were compiled by reviewers with lower reputation ( $M_{\text{LOW-REPUTATION}} = 4.898$ ,  $SD = 0.044$ ). H6 postulates that the impact of reviewer expertise and reviewer reputation on reviewer credibility is stronger (weaker) when perceptual homophily is high (low). Different from what H6a posits, the interaction effect between reviewer expertise and perceptual homophily on reviewer credibility is not empirically supported ( $F = 0.088$ ,  $p = 0.767$ ). As shown in Figure 5, the slope of line for homophilous source group is similar to that for heterophilous source group. Table 21 also exhibits that the extent of increase in reviewer credibility (from low expertise group to high expertise group) is largely similar regardless of readers' rating on perceptual homophily. Similarly, there is a non-significant interaction effect between reviewer reputation and perceptual homophily on reviewer credibility ( $F = 0.003$ ,  $p < 0.959$ ). Figure 6 and Table 21 show that the impact of reviewer reputation on reviewer credibility is not contingent upon readers' perceptual homophily level (i.e., H6b is not supported).

TABLE 21. TWO-WAY INTERACTION EFFECT ON REVIEWER CREDIBILITY

Variable	Perceptual homophily			
	Homophilous group <sup>a</sup>		Heterophilous group <sup>a</sup>	
<b>Reviewer expertise</b>				
High	5.770	(0.055)	5.667	(0.055)
Low	4.230	(0.069)	4.165	(0.066)
Mean diff. (High versus low)	+1.540	-	+1.502	-
<b>Reviewer reputation</b>				
High	5.780	(0.054)	4.256	(0.067)
Low	5.657	(0.056)	4.139	(0.068)
Mean diff. (High versus low)	+0.123	-	+0.117	-

**Note:** <sup>a</sup> Numbers reported in the cells are mean values; Numbers reported in the parentheses are standard errors.

FIGURE 5. INTERACTION EFFECT BETWEEN REVIEWER EXPERTISE AND PERCEPTUAL HOMOPHILY ON REVIEWER CREDIBILITY

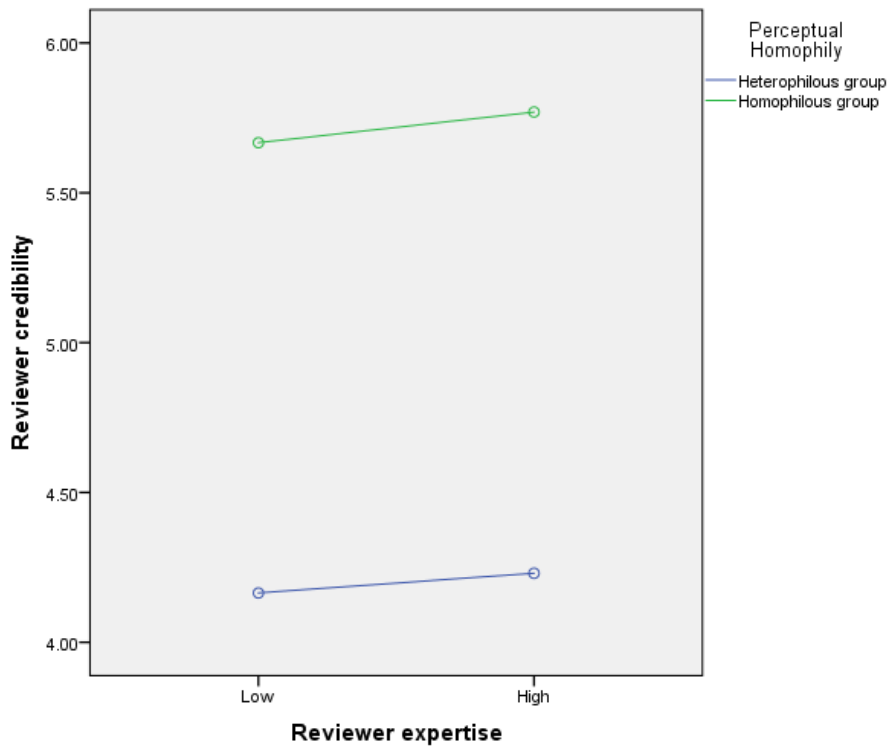
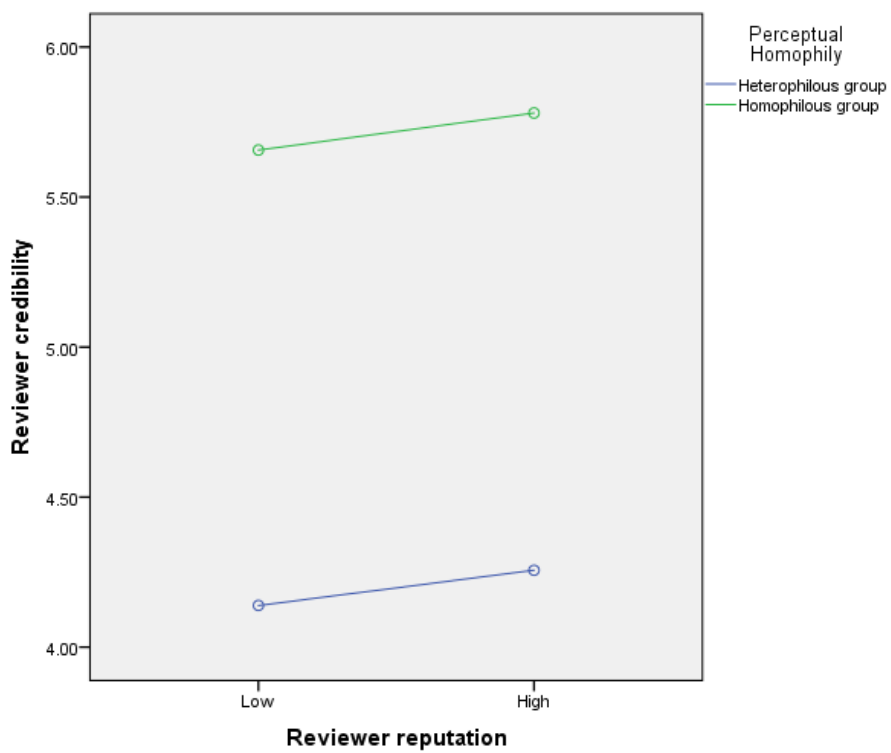


FIGURE 6. INTERACTION EFFECT BETWEEN REVIEWER REPUTATION AND PERCEPTUAL HOMOPHILY ON REVIEWER CREDIBILITY





### 5.3 Hypothesis testing (Part II)

To test and understand the interrelationship among review content quality, reviewer credibility, review usefulness and review adoption, a structural equation modeling has been conducted. Following the two-step approach recommended by Gerbing and Anderson (1988), the confirmatory factor analysis (CFA) with Mplus was firstly conducted to assess the validity of the measurement model as well as all latent constructs. Mplus was chosen since this tool can deal with non-parametric and skewed data (Wang & Wang, 2012).

Table 22, the results of the CFA, showed that convergent validity is achieved as the standardized loadings of all items were greater than the common cut-off value of 0.70 and statistically significant ( $p < 0.001$ ). The averaged variance extracted (AVE) values are all higher than the recommended cut-off value of 0.50 (Fornell & Larcker, 1981), suggesting that more than half of the variance observed are accounted for the hypothesized constructs. The composite reliability values of all latent constructs are higher than 0.70, indicating the internal consistency of the items in assessing the corresponding constructs (Hair et al., 2010). Discriminant validity was assessed by comparing the average variance extracted for all latent constructs as well as the corresponding squared correlation coefficient (Fornell & Larcker, 1981). Drawing on the figures shown in Table 23, the constructs do not share more variance with another construct in the model than the ones they are intended to. The script and output of confirmatory factor analysis using Mplus are presented in Appendix IV.

**TABLE 22. CONFIRMATORY FACTOR ANALYSIS RESULTS**

<b>Dimension / Measurement item</b>	<b>Loadings</b>	<b>CR<sup>b</sup></b>	<b>AVE<sup>c</sup></b>
<b>Review content quality</b>		0.907	0.713
The content in this review is (1: <i>Incomplete</i> – 7: <i>Complete</i> ).	0.768		
The content in this review is (1: <i>Inconsistent</i> – 7: <i>Consistent</i> ).	0.711		
The content in this review is (1: <i>Not convincing</i> – 7: <i>Convincing</i> ).	0.937		
The content in this review is (1: <i>Not persuasive</i> – 7: <i>Persuasive</i> ).	0.938		
<b>Reviewer credibility</b>		0.908	0.714
The writer of this review is (1: <i>Not knowledgeable</i> – 7: <i>Knowledgeable</i> ).	0.810		
The writer of this review is (1: <i>Not an expert</i> – 7: <i>An expert</i> ).	0.715		
The writer of this review is (1: <i>Not trustworthy</i> – 7: <i>Trustworthy</i> ).	0.919		
The writer of this review is (1: <i>Not reliable</i> – 7: <i>Reliable</i> ).	0.919		
<b>Review usefulness</b>		0.952	0.868
Overall, this review is (1: <i>Not valuable at all</i> – 7: <i>Very valuable</i> ).	0.913		
Overall, this review is (1: <i>Not useful at all</i> – 7: <i>Very useful</i> ).	0.949		

Overall, this review is (1: <i>Not helpful at all</i> – 7: <i>Very helpful</i> ).	0.932		
<b>Review adoption</b>		0.915	0.782
When you decide which hotel you would stay, you would consider the information and suggestions made by this review. <sup>a</sup>	0.789		
When you decide which hotel you would stay, you would adopt the information and suggestions made by this review. <sup>a</sup>	0.929		
When you decide which hotel you would stay, you would follow the suggestions made by this review. <sup>a</sup>	0.928		

**Note:**  $\chi^2$  test of model fit = 731.021,  $df = 71$ ,  $p < 0.001$ ; Root Mean Square Error of Approximation = 0.090; Comparative fit index = 0.922; Tucker-Lewis fit index = 0.900;  $N = 1,140$ .

<sup>a</sup> 7-point Likert scale (1: Strongly disagree – 7: Strongly agree) was used as a response scale;

<sup>b</sup> CR represents composite reliability;

<sup>c</sup> AVE represents averaged variance extracted.

**TABLE 23. TEST OF DISCRIMINANT VALIDITY**

Variables	Squared correlation coefficient <sup>a</sup>			
	1	2	3	4
<b>1. Review content quality</b>	1.000			
<b>2. Reviewer credibility</b>	0.709 **	1.000		
<b>3. Review usefulness</b>	0.554 **	0.566 **	1.000	
<b>4. Review adoption</b>	0.709 **	0.707 **	0.729 **	1.000
<b>Averaged variance extracted</b>	0.713	0.714	0.868	0.782

**Note:** \*\*\* represents  $p < 0.01$ .

After confirming the satisfactory validity and reliability of the measurement model, the parameters of the latent variables were then estimated using covariance-based structural equation modelling. The Comparative Fit index and the Tucker-Lewis index of the estimated model are 0.889 and 0.862, respectively. Both are close to the cut-off value of 0.90 suggested by Hu and Bentler (1995). Though the incremental fit index and absolute fit index exhibit that the data fit the model well, the value of Root Mean Square Error of Approximation (RMSEA) is slightly higher than the cut-off value suggested by MacCallum, Browne and Sugawara (1996) (Actual: 0.106; Recommended: below 0.08). This implies that the estimated model fits the sample used for estimation but not for the population.

The model estimation results show that review content quality has a positive impact on review usefulness ( $\beta = 0.568$ ,  $p < 0.001$ ), suggesting that H7a is supported. Reviewer credibility is also found to have a positive and slightly greater impact on review usefulness ( $\beta = 0.591$ ,  $p < 0.001$ ) than review content quality. The R-square value of review usefulness is 0.672, denoting that

67.2% of variance in review usefulness can be explained by these two constructs. Regarding the relationship between review usefulness and review adoption, the result shows that H7c is supported and review usefulness has a positive impact on review adoption ( $\beta = 0.757$ ,  $p < 0.001$ ). This suggests that if readers reference hotel reviews which are highly useful, they are more likely to consider and follow their suggestions when they decide which hotel they would stay. The script and output of the structural equation modeling using Mplus are presented in Appendix V. Table 24 presents a summary of research hypotheses and their testing outcomes

**TABLE 24. SUMMARY OF HYPOTHESES TESTING OUTCOMES**

<b>Hypothesis</b>	<b>Outcome</b>
<b>H1.</b> Hotel reviews with greater scope are perceived to have a higher level of review content quality than those with lesser scope	Not supported
<b>H2.</b> Hotel reviews with greater amount of information are perceived to have a higher level of review content quality than those with lesser amount	Supported
<b>H3.</b> Hotel reviews using functional language are perceived to have a higher level of review content quality than those using emotional language	Supported
<b>H4.</b> Hotel reviews from providers with higher level of expertise are perceived to have a higher level of reviewer credibility than those from providers with lower level of expertise	Not supported
<b>H5.</b> Hotel reviews from providers with higher level of reputation are perceived to have a higher level of reviewer credibility than those from providers with lower level of reputation	Supported
<b>H6a.</b> The impact of reviewer expertise on reviewer credibility is stronger (weaker) when perceptual homophily is high (low)	Not supported
<b>H6b.</b> The impact of reviewer reputation on reviewer credibility is stronger (weaker) when perceptual homophily is high (low)	Not Supported
<b>H7a.</b> Review content quality has a positive impact on review usefulness	Supported
<b>H7b.</b> Reviewer credibility has a positive impact on review usefulness	Supported
<b>H7c.</b> Review usefulness has a positive impact on review adoption	Supported

## 5.4 Exploratory analysis using graphical modeling

As shown in Figure 4 (see page 126) as well as sections 5.2 to 5.3, the conceptual framework of this study was tested based on two separate analyses (i.e., ANOVA tests and structural equation modeling). In order to test the proposed model holistically as well as to explore the existence of potential relations among the variables, an additional analysis was conducted using graphical

modeling (GM) – a multivariate data analysis approach that uses graphs to express the conditional dependence structure among variables (Edwards, 2000).

Using a graph-based representation as the foundation for exhibiting the relations among variables, Haughton, Kamis and Scholten (2006) describes that the existence of a directed edge between nodes in the directed graph represents there is a causal relationship between those nodes. Kim and Lee (2008) claim that GM is similar to and somehow outperform structural equation model in two aspects. First, structural equation modeling is used to formulate a theory-driven model based on temporal ordering of variables. GM however requires no variable order, and it searches through all possible classes of models that fit best. Second, the relationships among the constructs in structural equation modeling must be directed, while the relationships among the constructs in GM can be undirected or/and directed. In other words, GM can potentially provide more understanding of multiple equivalent models (Kim & Lee, 2008).

Unlike Kim and Lee's (2008) study, a chain graph model (i.e., a graph with both undirectional edges and directional arrows) was firstly established as the start model because a conceptual framework was formulated (see Figure 4) and the directions of relationships among the variables were known. According to Edwards (2000), fitting a chain graph model requires the grouping of variables into blocks in order to define the directionality. Following the conceptual framework, four blocks were created and the manipulated variables (e.g., review breadth, reviewer expertise) were assigned into block one. Review content quality and reviewer credibility were assigned to block two, while review usefulness and review adoption were grouped into block three and four, respectively. Direction of arrows were determined following the research hypotheses. In other words, all variables in block one pointed to variables in block two and et cetera. Undirected interactions within each block are permitted in order to explore the existence of potential relations among the variables in the same block. Figure 7 and Appendix VI show the start model.

FIGURE 7. START MODEL

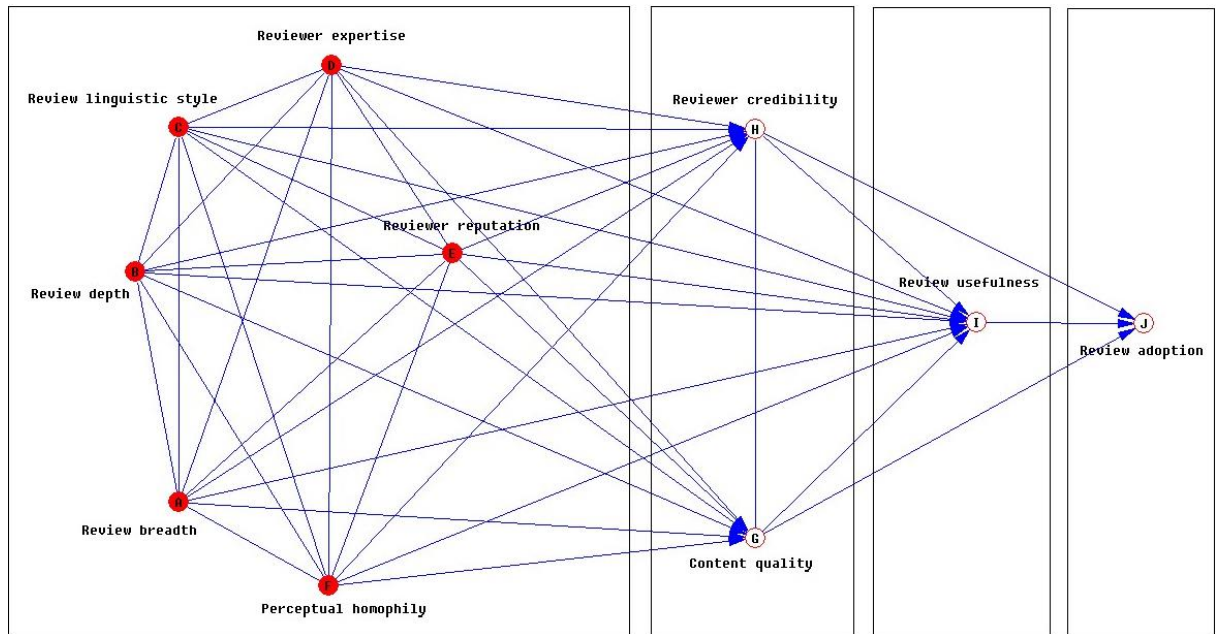
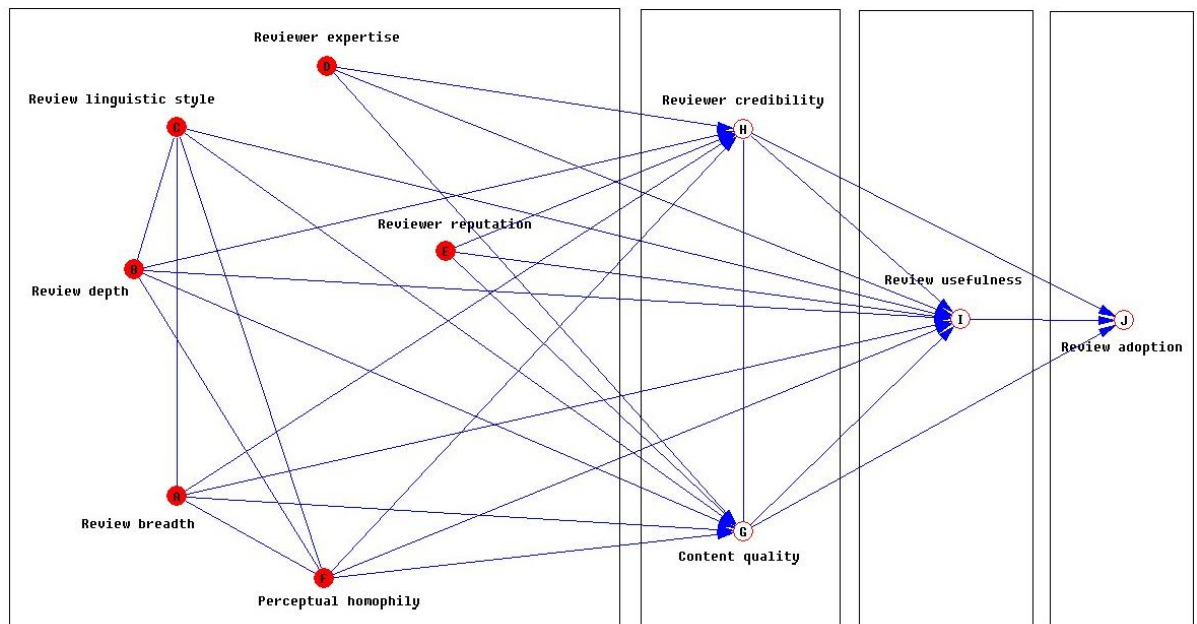


FIGURE 8. BEST FITTING MODEL



Backward elimination method was employed to govern the fitting process. Based on the chi-square test result (with the critical p-value set to 0.05), the edge with the highest p-value was removed from the current model at each step. After removing the edge, the revised model was then re-tested until all edges' significance values were below 0.05. In this study, the model spec-

ification and testing were conducted using MIM (Mixed Interaction Modeling), a software system created by David Edwards. Figure 8 and Appendix VII show the best fitting model ( $-2 \times \text{Log-likelihood} = 19,312.9496$ ,  $df = 315$ ,  $p < 0.001$ ). The script and output of GM results using MIM are presented in Appendix VIII.

The arrows pointed from block 2 to blocks 3 and 4 (of Figure 8) exhibit two insightful information relating to the interrelationship among those continuous variables (i.e., review content quality, reviewer credibility, review usefulness and review adoption). First, concordant to H7a and H7b, the GM results show that review content quality (coeff. = 0.0572) and reviewer credibility (coeff. = 0.418) have direct and positive impacts on review usefulness (see Table 25). H7c is also supported given that review usefulness is found to have a positive and substantial impact on review adoption (coeff. = 0.744). These provide additional evidence to the structural equation modeling results reported in section 5.3. In addition to validating the hypotheses postulated in this study, the GM results also unveil that both review content quality (coeff. = 0.089) and reviewer credibility (coeff. = 0.138) have direct and positive influences on review adoption. Although the parameter estimates of these two variables are not as high as that of review usefulness, the results suggest that review content quality and reviewer credibility have both direct and indirect impact (via review usefulness) on readers' review adoption predisposition.

**TABLE 25. PARAMETER ESTIMATES OF REVIEW USEFULNESS AND REVIEW ADOPTION**

Variable	Parameter estimates <sup>b</sup>
<b>DV: Review usefulness (J) <sup>a</sup></b>	
Constant	0.082
Review content quality (G) <sup>a</sup>	0.572
Reviewer credibility (H) <sup>a</sup>	0.418
<b>DV: Review adoption (J) <sup>a</sup></b>	
Constant	-0.081
Review content quality (G) <sup>a</sup>	0.089
Reviewer credibility (H) <sup>a</sup>	0.138
Review usefulness (I) <sup>a</sup>	0.744

**Note:**

<sup>a</sup> Symbol can be referred to Figure 8.

<sup>b</sup> In GM, the parameter estimates represent regression coefficient for continuous variables.

The best fitting model (i.e., Figure 8) from GM shows the existence of arrows pointed from all variables in block 1 to review content quality in block 2. This suggests that all six review-related variables are significant factors affecting review content quality. With the exception of "review linguistic style", five out of six review-related variables are also found to have some influence

on reviewer credibility. In addition, a set of arrows pointed from all six variables in block 1 to review usefulness (in block 3) are identified. In other words, review-related variables exert some direct influence on review usefulness as well. Table 25 summarizes the parameter estimates (which are mean scores of dependent variables in graphical modeling) of review content quality, reviewer credibility as well as review usefulness. Through observing the changes of parameter estimates when independent variables alter from one level to another level (e.g., review depth changes from the low level to the high level group), a number of main and interaction effects are identified.

First, the main effect of perceptual homophily on all dependent variables is evident. As shown in the “CON” and “USE” columns of Table 25, reviews from homophilous source (i.e., high in “PH” column) were perceived to have a higher level of content quality, reviewer credibility and usefulness. By contrast, reviews from heterophilous source (i.e., low in “PH” column) were largely considered as having a lower level of content quality, reviewer credibility and usefulness. Ruef, Alrich and Carter (2003) note that similarity between communicators predispose them toward greater levels of understanding than dissimilar individuals. In social psychology, numerous researchers argue and verify that similarities can create a sense of association between communicators. This sense of association may then lead to the enhancement of positive perceptions to the communicators as well as their shared content (Guéguen & Martin, 2009; Jones, Pelham, Carvallo & Mirenberg, 2004). Naylor, Lamberton and Norton (2011) recently test and report that consumers are more likely to be persuaded to visit a resort after reading positive reviews posted by reviewers with similar tastes. Although this study does not directly support Naylor et al.’s (2011) notion that reviews from homophilous source are more persuasive, the current findings extend the literature by demonstrating the main and positive impact of perceptual homophily on review content quality, reviewer credibility as well as review usefulness.

**TABLE 26. PARAMETER ESTIMATES OF REVIEW CONTENT QUALITY, REVIEWER CREDIBILITY AND REVIEW USEFULNESS**

Independent variables <sup>a</sup>						Dependent variables <sup>a c</sup>		
RB	RD	RLS <sup>b</sup>	RE	RR	PH	CON	CRE	USE
Low	High	FUN	Low	Low	High	6.740 (1)	5.882 (7)	6.505 (2)
Low	High	EMO	High	High	High	6.685 (2)	6.019 (2)	6.429 (4)
Low	High	FUN	Low	High	High	6.519 (3)	5.997 (4)	6.466 (3)
High	High	EMO	High	High	High	6.490 (4)	6.080 (1)	6.507 (1)
Low	High	EMO	Low	Low	High	6.479 (5)	5.633	6.039
High	High	FUN	High	Low	High	6.472 (6)	5.801 (10)	6.417 (5)
High	High	FUN	Low	High	High	6.455 (7)	5.695	6.361 (9)
High	High	EMO	Low	High	High	6.440 (8)	5.681	6.182
Low	High	FUN	High	Low	High	6.405 (9)	5.831 (8)	6.348 (10)

Low	High	EMO	Low	High	High	6.403 (10)	5.949 (5)	6.380 (6)
Low	Low	EMO	High	High	High	6.400	6.010 (3)	6.287
High	High	FUN	Low	Low	High	6.357	5.661	6.370 (7)
Low	High	FUN	High	High	High	6.352	5.762	6.312
High	Low	EMO	Low	High	High	6.325	5.816 (9)	6.366 (8)
High	High	FUN	High	High	High	6.286	5.946 (6)	6.345
High	High	EMO	Low	Low	High	6.278	5.611	6.082
High	Low	EMO	Low	Low	High	6.271	5.722	6.110
High	High	EMO	High	Low	High	6.263	5.681	6.032
Low	Low	FUN	High	Low	High	6.224	5.560	5.884
High	Low	FUN	High	High	High	6.159	5.764	6.004
Low	High	EMO	High	Low	High	6.083	5.683	6.186
Low	Low	EMO	Low	High	High	6.077	5.592	6.085
Low	Low	EMO	Low	Low	High	6.036	5.632	5.956
High	Low	FUN	High	Low	High	6.022	5.673	6.068
Low	Low	EMO	High	Low	High	6.019	5.451	5.904
High	Low	EMO	High	High	High	5.967	5.647	6.014
High	Low	FUN	Low	Low	High	5.961	5.492	5.977
High	Low	FUN	Low	High	High	5.943	5.572	5.969
Low	Low	FUN	High	High	High	5.900	5.618	5.833
High	High	FUN	High	Low	Low	5.844	5.156	5.792
Low	Low	FUN	Low	High	High	5.726	5.303	5.705
High	Low	EMO	High	Low	High	5.672	5.454	5.914
Low	Low	FUN	Low	Low	High	5.661	5.391	5.756
Low	High	FUN	High	Low	Low	5.643	4.847	5.095
High	High	FUN	High	High	Low	5.625	5.225	5.536
High	High	EMO	High	Low	Low	5.442	4.942	5.231
Low	High	EMO	High	High	Low	5.250	4.445	4.710
High	Low	FUN	Low	High	Low	5.250	4.600	4.930
Low	High	FUN	High	High	Low	5.000	4.323	5.053
High	High	FUN	Low	Low	Low	5.000	4.591	4.162
Low	High	FUN	Low	High	Low	4.938	4.529	5.601
High	High	EMO	High	High	Low	4.883	4.663	4.372
Low	High	FUN	Low	Low	Low	4.861	4.064	4.342
Low	High	EMO	High	Low	Low	4.854	4.006	4.378
High	Low	FUN	High	High	Low	4.846	4.415	4.724
High	Low	EMO	High	High	Low	4.792	4.380	4.210
High	Low	EMO	Low	Low	Low	4.750	4.323	4.442
High	High	EMO	Low	High	Low	4.732	4.427	4.436
High	High	EMO	Low	Low	Low	4.706	4.409	3.988
Low	High	EMO	Low	High	Low	4.688	4.345	4.512
High	Low	EMO	High	Low	Low	4.587	4.002	4.099
Low	Low	EMO	Low	High	Low	4.583	4.116	4.254



High	Low	FUN	High	Low	Low	4.481	3.939	4.323
High	High	FUN	Low	High	Low	4.438	4.192	3.598
High	Low	FUN	Low	Low	Low	4.375	4.201	4.159
Low	High	EMO	Low	Low	Low	4.333	3.889	3.380
Low	Low	FUN	Low	Low	Low	4.315	3.958	4.131
Low	Low	FUN	Low	High	Low	4.292	3.917	4.238
Low	Low	EMO	Low	Low	Low	4.200	3.881	4.310
High	Low	EMO	Low	High	Low	4.141	3.711	3.735
Low	Low	EMO	High	Low	Low	4.042	3.654	3.539
Low	Low	FUN	High	High	Low	3.971	4.103	3.882
Low	Low	EMO	High	High	Low	3.900	3.892	3.414
Low	Low	FUN	High	Low	Low	3.828	3.576	3.479

**Note:**

<sup>a</sup> RB represents review breadth; RD represents review depth; RLS represents review linguistic style; RE represents reviewer expertise; RR represents reviewer reputation; CON represents review content quality; CRE represents reviewer credibility; USE represents review usefulness.

<sup>b</sup> FUN represents functional language; EMO represents emotional language.

<sup>c</sup> Numbers reported in the parentheses show the rank of top ten values (1: Highest; 2: Second highest).

The interaction effect with three variables, including review breadth, review depth and reviewer expertise, on review content quality and review usefulness was observed. Specifically, when readers' perceptual homophily level is controlled at the low level, reviewer expertise would moderate the impact of review depth and review breadth on review content quality and review usefulness. As shown in Table 27, when short and narrow reviews were presented, readers' ratings on review content quality and review usefulness were higher (lower) if reviews were written by non-expert (expert) reviewers. However, when long and broad reviews were presented, readers' ratings on review content quality and review usefulness were lower (higher) if reviews were written by non-expert (expert) reviewers.

Bansal and Voyer (2000) as well as Pornpitakpan (2004) commonly agree that people are inclined to solicit advice from experts rather than from non-experts because experts are assumed to possess the knowledge and ability to provide extensive information. Since this commonly accepted notion leads readers to presume that expert reviewers are more likely provide more and broader information in their reviews, the act of contributing short and narrow reviews by expert reviewers is considered as norm-breaking or unacceptable and thereby being perceived negatively by review readers. In contrast, given that non-expert reviewers are not postulated to have ample knowledge about the discuss object, readers are tolerant when they evaluate content quality and usefulness of reviews provided by non-expert reviewers. Hence, even though non-expert reviewers did not offer comprehensive information in their reviews, readers still rated the review content quality and usefulness at an acceptable level.

**TABLE 27. INTERACTION EFFECT OF REVIEW BREADTH, REVIEW DEPTH AND REVIEWER EXPERTISE ON REVIEW CONTENT QUALITY AND REVIEW USEFULNESS**

Independent variables <sup>a</sup>						Dependent variables <sup>a</sup>		
RB	RD	RLS <sup>b</sup>	RE	RR	PH	CON	CRE	USE
Low	Low	FUN	High	Low	Low	3.828	3.576	3.479
Low	Low	FUN	High	High	Low	3.971	4.103	3.882
Low	Low	EMO	High	Low	Low	4.042	3.654	3.539
Low	Low	EMO	High	High	Low	3.900	3.892	3.414
Low	Low	FUN	Low	Low	Low	4.315	3.958	4.131
Low	Low	FUN	Low	High	Low	4.292	3.917	4.238
Low	Low	EMO	Low	Low	Low	4.200	3.881	4.310
Low	Low	EMO	Low	High	Low	4.583	4.116	4.254
High	High	FUN	Low	Low	Low	5.000	4.591	4.162
High	High	FUN	Low	High	Low	4.438	4.192	3.598
High	High	EMO	Low	Low	Low	4.706	4.409	3.988
High	High	EMO	Low	High	Low	4.732	4.427	4.436
High	High	FUN	High	Low	Low	5.844	5.156	5.792
High	High	FUN	High	High	Low	5.625	5.225	5.536
High	High	EMO	High	Low	Low	5.442	4.942	5.231
High	High	EMO	High	High	Low	4.883	4.663	4.372

**Note:**

<sup>a</sup> RB represents review breadth; RD represents review depth; RLS represents review linguistic style; RE represents reviewer expertise; RR represents reviewer reputation; CON represents review content quality; CRE represents reviewer credibility; USE represents review usefulness.

<sup>b</sup> FUN represents functional language; EMO represents emotional language.

Besides the abovementioned interaction effect, the GM results also showed there is an interaction effect between review linguistic style and perceptual homophily on reviewer credibility, when long and broad reviews were presented (see Table 28). To those long and broad reviews contributed by homophilous source, the choice of linguistic style did not significantly influence how readers perceived reviewer credibility (mean difference ranged from 0.014 to -0.134). Yet, if those long and broad reviews were contributed by reviewers with dissimilar interests or values, the choice of linguistic style posed substantial impact on how readers perceived reviewer credibility (mean difference ranged from 0.164 to 0.562). In particular, readers gave a higher reviewer credibility rating to reviews using functional language at a higher level than those using emotional language. As highlighted in section 3.2.1, Burgoon's (1995) language expectancy theory asserts that emotional language is more appropriate to be used by individuals with similar interests or with intimate social relationships while functional language is the conversational norm used among strangers or unfamiliar individuals. Given that the inappropriate use of linguistic style in review writing would discount the persuasiveness of review content as well as

the credence of its contributor (Jensen, Averbek, Zhang & Wright, 2013), it is therefore comprehensible why readers gave a higher reviewer credibility rating to reviews using functional language when they were compiled by dissimilar reviewers.

**TABLE 28. INTERACTION EFFECT OF REVIEW LINGUISTIC STYLE AND PERCEPTUAL HOMOPHILY ON REVIEWER CREDIBILITY**

Independent variables <sup>a</sup>						Dependent variables <sup>a</sup>	
RB	RD	RLS <sup>b</sup>	RE	RR	PH	CRE	Mean diff. (FUN vs. EMO)
High	High	FUN	High	High	High	5.946	Diff. = - 0.134
High	High	EMO	High	High	High	6.080	
High	High	FUN	High	Low	High	5.801	Diff. = 0.120
High	High	EMO	High	Low	High	5.681	
High	High	FUN	Low	High	High	5.695	Diff. = 0.014
High	High	EMO	Low	High	High	5.681	
High	High	FUN	Low	Low	High	5.661	Diff. = 0.050
High	High	EMO	Low	Low	High	5.611	
High	High	FUN	High	High	Low	5.225	Diff. = 0.562
High	High	EMO	High	High	Low	4.663	
High	High	FUN	High	Low	Low	5.156	Diff. = 0.216
High	High	EMO	High	Low	Low	4.942	
High	High	FUN	Low	Low	Low	4.591	Diff. = 0.164
High	High	EMO	Low	High	Low	4.427	
High	High	FUN	Low	High	Low	4.192	Diff. = - 0.217
High	High	EMO	Low	Low	Low	4.409	

**Note:**

<sup>a</sup> RB represents review breadth; RD represents review depth; RLS represents review linguistic style; RE represents reviewer expertise; RR represents reviewer reputation; CRE represents reviewer credibility.

<sup>b</sup> FUN represents functional language; EMO represents emotional language.

Regarding the impact on review usefulness, the interaction effect by review breadth and reviewer expertise is observed when readers' perceptual homophily level is controlled at the low level. As shown in Table 29, the change in review breadth (e.g., from low level to high level) only created negligible changes on review usefulness if those reviews were contributed by non-expert reviewers. But if those reviews were written by expert reviewers, the change in review breadth induced a comparatively stronger impact on review usefulness. Similarly, review depth and reviewer expertise have an interaction effect on review usefulness when readers' perceptual homophily level is controlled at the low level. Table 30 exhibits that the impact of review

depth on review usefulness was limited if those reviews were contributed by non-expert reviewers. However, the impact of review depth on review usefulness was comparatively stronger if those reviews were contributed by expert reviewers.

Daft and Lengel's (1986) uncertainty reduction theory posit that reviews with elaborate information tend to be more persuasive and useful than those with less information. Hovland and colleagues' (1953) source credibility theory has also long proven that reviews written by expert reviewers are rated as more persuasive and useful. Since both information richness and reviewer expertise are key determinants affecting the persuasiveness and usefulness of a message, the enhancement of both reviewer expertise and information richness may therefore create the multiplicative impact on the increment in review usefulness. To the best of the author's knowledge, the individual impact of information richness and reviewer expertise on review usefulness have been extensively investigated in prior studies (e.g., Liu & Park, 2015; Mudambi & Schuff, 2010; Racherla & Friske, 2012; Willemsen, Neijens, Bronner & de Ridder, 2011). However, this study represents the first time that an interaction effect of these two factors on review usefulness is identified and discussed. Subsequent researchers are highly recommend to validate this multiplicative impact on review usefulness in future research.

**TABLE 29. INTERACTION EFFECT OF REVIEW BREADTH AND REVIEW EXPERTISE ON REVIEW USEFULNESS**

Independent variables <sup>a</sup>						Dependent variables <sup>a</sup>	
RB	RD	RLS <sup>b</sup>	RE	RR	PH	USE	Mean diff. (High RB vs. Low RB)
High	High	EMO	Low	High	Low	4.436	Diff. = - 0.076
Low	High	EMO	Low	High	Low	4.512	
High	High	FUN	Low	High	Low	3.598	Diff. = - 2.003
Low	High	FUN	Low	High	Low	5.601	
High	Low	EMO	Low	High	Low	3.735	Diff. = - 0.519
Low	Low	EMO	Low	High	Low	4.254	
High	Low	FUN	Low	High	Low	4.930	Diff. = 0.692
Low	Low	FUN	Low	High	Low	4.238	
High	High	EMO	Low	Low	Low	3.988	Diff. = 0.608
Low	High	EMO	Low	Low	Low	3.380	
High	High	FUN	Low	Low	Low	4.162	Diff. = - 0.180
Low	High	FUN	Low	Low	Low	4.342	
High	Low	EMO	Low	Low	Low	4.442	Diff. = 0.132
Low	Low	EMO	Low	Low	Low	4.310	
High	Low	FUN	Low	Low	Low	4.159	Diff. = 0.028
Low	Low	FUN	Low	Low	Low	4.131	
High	High	EMO	High	High	Low	4.372	Diff. = - 0.338
Low	High	EMO	High	High	Low	4.710	
High	High	FUN	High	High	Low	5.536	Diff. = 0.483

Low	High	FUN	High	High	Low	5.053	
High	Low	EMO	High	High	Low	4.210	Diff. = 0.796
Low	Low	EMO	High	High	Low	3.414	
High	Low	FUN	High	High	Low	4.724	Diff. = 0.842
Low	Low	FUN	High	High	Low	3.882	
High	High	EMO	High	Low	Low	5.231	Diff. = 0.853
Low	High	EMO	High	Low	Low	4.378	
High	High	FUN	High	Low	Low	5.792	Diff. = 0.697
Low	High	FUN	High	Low	Low	5.095	
High	Low	EMO	High	Low	Low	4.099	Diff. = 0.560
Low	Low	EMO	High	Low	Low	3.539	
High	Low	FUN	High	Low	Low	4.323	Diff. = 0.844
Low	Low	FUN	High	Low	Low	3.479	

**Note:**

<sup>a</sup> RB represents review breadth; RD represents review depth; RLS represents review linguistic style; RE represents reviewer expertise; RR represents reviewer reputation; USE represents review usefulness.

<sup>b</sup> FUN represents functional language; EMO represents emotional language.

**TABLE 30. INTERACTION EFFECT OF REVIEW DEPTH AND REVIEW EXPERTISE ON REVIEW USEFULNESS**

Independent variables <sup>a</sup>						Dependent variables <sup>a</sup>	
RB	RD	RLS <sup>b</sup>	RE	RR	PH	USE	Mean diff. (High RD vs. Low RD)
High	High	EMO	Low	High	Low	4.436	Diff. = 0.701
High	Low	EMO	Low	High	Low	3.735	
Low	High	EMO	Low	High	Low	4.512	Diff. = 0.258
Low	Low	EMO	Low	High	Low	4.254	
High	High	FUN	Low	High	Low	3.598	Diff. = - 1.332
High	Low	FUN	Low	High	Low	4.930	
Low	High	FUN	Low	High	Low	5.601	Diff. = 1.363
Low	Low	FUN	Low	High	Low	4.238	
High	High	EMO	Low	Low	Low	3.988	Diff. = - 0.454
High	Low	EMO	Low	Low	Low	4.442	
Low	High	EMO	Low	Low	Low	3.380	Diff. = - 0.930
Low	Low	EMO	Low	Low	Low	4.310	
High	High	FUN	Low	Low	Low	4.162	Diff. = 0.003
High	Low	FUN	Low	Low	Low	4.159	
Low	High	FUN	Low	Low	Low	4.342	Diff. = 0.211
Low	Low	FUN	Low	Low	Low	4.131	
High	High	EMO	High	High	Low	4.372	Diff. = 0.162
High	Low	EMO	High	High	Low	4.210	
Low	High	EMO	High	High	Low	4.710	Diff. = 1.296
Low	Low	EMO	High	High	Low	3.414	
High	High	FUN	High	High	Low	5.536	Diff. = 0.812

High	Low	FUN	High	High	Low	4.724	
Low	High	FUN	High	High	Low	5.053	Diff. = 1.171
Low	Low	FUN	High	High	Low	3.882	
High	High	EMO	High	Low	Low	5.231	Diff. = 1.132
High	Low	EMO	High	Low	Low	4.099	
Low	High	EMO	High	Low	Low	4.378	Diff. = 0.839
Low	Low	EMO	High	Low	Low	3.539	
High	High	FUN	High	Low	Low	5.792	Diff. = 1.469
High	Low	FUN	High	Low	Low	4.323	
Low	High	FUN	High	Low	Low	5.095	Diff. = 1.616
Low	Low	FUN	High	Low	Low	3.479	

**Note:**

<sup>a</sup> RB represents review breadth; RD represents review depth; RLS represents review linguistic style; RE represents reviewer expertise; RR represents reviewer reputation; USE represents review usefulness.

<sup>b</sup> FUN represents functional language; EMO represents emotional language.

## 6 IMPLICATIONS AND CONCLUSIONS

### 6.1 Theoretical implications

As evidenced by the exponential increase in review volume, it cannot be denied that travelers are becoming more comfortable in posting reviews. Considering that the volume of online reviews is increased exponentially, it is of utmost importance to understand the potential factors affecting the diagnostic value of online reviews. Using a 2 x 2 x 2 x 2 x 2 between-subject experimental design, this study experimentally tests and demonstrates how the six selected characteristics influence readers' perceived review usefulness, and how those in turn influence their adoption intention.

The theoretical contribution of the current study is twofold. From the topical point of view, although some characteristics included in the conceptual framework (e.g., review depth and reviewer expertise) have been examined in prior studies, this study appears to be one of the first attempts to combine content-, style- and source-related characteristics in predicting readers' perceived review usefulness and adoption intention in one study. Particularly, this study is the first one which incorporates review linguistic style and perceptual homophily in the prediction of online review usefulness. Since readers read both review content and reviewer profile when they reference online reviews, adding to the fact that content and style in reviews are inherently inseparable (Ludwig et al., 2013), both content-, style- and source-related characteristics should be included in one model in order to thoroughly understand how they affect receivers' perceived usefulness of online hotel reviews. Through validating the significant roles of review breadth, review depth, review linguistic style, reviewer expertise, reviewer reputation, and perceptual homophily in predicting review usefulness. This study provide academics and practitioners with extensive knowledge about "what makes a useful online hotel review?"

From the methodological point of view, the application of a new methodology (i.e., experiment) to investigate usefulness of online reviews is deemed to be another theoretical contribution of this work. As noted in the introduction section, a majority of existing studies employ the approach of analyzing archival data for validating the impact of antecedents on the count of helpful votes (e.g., Fang et al., 2016; Liu & Park, 2015; Racherla & Friske, 2012; Yang et al., 2017). Since the count of helpful vote cannot reflect the evaluations of readers who read but did not vote (Racherla & Friske, 2012), the use of experimental design and specifically direct measure of review usefulness (i.e., readers' rating on review usefulness related items after reading a review) can redress the under-reporting bias. Hence, this study opens a new venue for the examination of "what makes a useful online review" and provides evidence to triangulate the results generated from panel data analysis. Apart from the adoption of experiment design, the current study

also demonstrates the functionality of graphical modeling in the exploitation of potential structure among studied variables. Although this approach has been widely used in consumer research (e.g., Kim, Christiansen, Feinberg & Choi, 2005), medical research (e.g., Clelia & Biffi, 2004), soil science research (e.g., Cohen, Shepherd & Walsh, 2005) and others, it has never been applied in any study in the tourism field. As exhibited in the current study, graphical modeling is capable of analyzing and discovering potential structures based on unstructured information. It is deemed to be useful in tourist behavior research since diversified factors can potentially influence tourists' information processing, decision making and post-purchase evaluation.

## 6.2 Practical implications

In addition to the contribution to the knowledge and theory, the managerial implications are also significant. First, the current research findings equip hoteliers with knowledge about how to identify useful reviews from the sheer quantity of reviews existing in various consumer review sites. On one hand, since readers may pay more attention to the information and suggestions in those useful reviews, the identification and analysis of the content of these useful reviews can effectively help hoteliers acquire insights about what customers like and dislike their property from those useful reviews. On the other hand, since useful reviews have a higher level of diagnostic value which can help consumers make a better purchase decision, hoteliers may consider placing those useful reviews next to their offerings (e.g., list of rooms types after indicating the check-in and check-out date) or/and attaching them with their promotional emails.

Second, the research findings provide online travel agencies (e.g., Hotels.com and Expedia.com) and travel-related review sites (e.g., TripAdvisor.com and Yelp.com) with some clues to develop a practical filter for sorting useful reviews from all reviews they received. Unlike Amazon.com which can sort and present a batch of "Top customer reviews" based on some criteria (e.g., recency, length of content, verified purchase), most of online travel agencies and travel-related consumer review sites do not offer this function for their website visitors. As noted earlier, the large number of online reviews poses a potential threat of information overload for information seekers (Malhotra, 1982). To shorten website visitors' time to identify those useful reviews, operators can establish a filter for sorting and listing useful reviews drawing on the findings presented in this study (i.e., long reviews written by reputable members using functional language). Ideally, this filter or function can improve user experience with the site, increase visitors' satisfaction and even engagement with the site.

Last but not the least, the current study provides a practical guideline for interested parties (including hoteliers, operators of online travel agencies and travel related review sites) to acquire more useful reviews to their sites. Since the research findings show that longer reviews written



in functional language are perceived as more useful to reviewer readers, hoteliers should encourage or even incentivize their customers to provide detailed information about their stays with their hotel in a descriptive manner. Hoteliers should kindly advise those reputable members (i.e., those receiving many helpful votes before) to contribute a review.

### 6.3 Limitations and future research

Alike other research studies, this study is subject to some limitations which may limit its generalizability. First, with reference to participants' response to the statement "*Before making a hotel booking, you rely on online reviews ... [1: Not at all – 7: Very much]*" (mean = 5.00, SD = 1.023), the participants of this study tend to rely on online reviews before making a hotel booking. Even though this study includes a representative panel of Internet users (in terms of demographic profiles), subsequent researchers should cautiously generalize the findings to those travelers who do not highly rely on online reviews. Second, given that only one piece of review was shown to the participant but travelers often read multiple reviews before making a booking (see Appendix III), the volume and conformity of reviews were not investigated in this study so that different results may be shown when multiple reviews are presented to the experimenters. To redress this, future research should present multiple reviews in the stimulation materials in order to make it similar to the real-life situation. Moreover, the names of hotel brands or/and review platforms can also be specified in the scenario in order to examine the consistency in responses. The present research includes and tests how those five selected characteristics affect readers' perceived usefulness of online hotel reviews based on a between-subject experiment. But given that all characteristics included in this study are in the form of text, another direction for future research is to explore the impact of pictorial elements (e.g., presence of photo/s in a review, reviewers' profile pictures) on readers' assessment on review usefulness. Following the cliché of "a picture is worth a thousand words", future research may thus investigate whether text-photo form of reviews are perceived to be more useful than those without a photo/photos.

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## APPENDIX


### Appendix I. Review text used in the stimulation material

Review breadth	Review depth	Review style	Review text
High	High	Emotional	<p>Recently stayed here for two nights, and we were treated like royalty from start to finish. Fabulous location that no hotel can compare - a stone's throw away from the central train station; steps away from major attractions and restaurants.</p> <p>The guestroom is bigger than in a palace, and soooooo comfortable. Bed is like heaven and perfect for rejuvenation. Good sound-proofing - we are completely shielded from the outside noise once the door is closed.</p> <p>This hotel is the epitome of excellent guest service. All staff at this hotel are friendly and helpful, and they will pamper you throughout your stay. Can't recommend this place highly enough!</p>
High	High	Functional	<p>Recently stayed here for two nights, and our experience was simply wonderful. The hotel is in a good location – right next to the central train station and all major attractions and restaurants are just a few minutes away.</p> <p>The guestroom is very spacious and comfortable. Bed is also comfortable, which is perfect after a long day of sightseeing. The sound-proofing is good as we heard no noise from the street, staff or other guests during the night.</p> <p>The customer service is excellent. All staff at this hotel are friendly and helpful, and they do their best to make your stay a wonderful experience. Highly recommend this hotel to anyone.</p>
High	Low	Emotional	<p>Great location - a stone's throw away from central train station. Room is bigger than in a palace with veryyyyyyyy comfortable bed. Lost for words as to their impeccable service. Highly recommended!</p>
High	Low	Functional	<p>The location of this hotel is great. It is situated right next to the central train station. The room is very spacious with a comfortable bed. The customer service is great. Highly recommended!</p>


Low	High	Emotional	<p>Recently stayed in this hotel for two nights, and we were treated like royalty from start to finish. The room we stayed in had an amazing city view that blows our minds. The room is bigger than in a palace. It is spacious enough for 5+ people to chill after dinner.</p> <p>The room is so clean you could eat off the floor. The sound-proofing is good. We are completely shielded from the outside noise once the door is closed. Bed is like heaven which makes me wanna buy one for my own house. I can't recommend this place highly enough and would definitely stay here again.</p>
Low	High	Functional	<p>Recently stayed in this hotel for two nights, and our experience was simply wonderful. The room we stayed in had an amazing view of the city. The room is bigger than what we expected. It is spacious enough to accommodate a family of four.</p> <p>The room is clean and tidy. The housekeeping has done an excellent job daily. The sound-proofing is good as we heard no noise from the street, staff or other guests in the night. Bed is very comfortable, which is perfect for us after a long day of sightseeing. I highly recommend this hotel to anyone. Will stay here when I return.</p>
Low	Low	Emotional	<p>The guestroom is bigger than in a palace, and completely shielded from the outside noise. Bed is super comfy. The free toiletries are a MASTERSTROKE. Highly recommended!</p>
Low	Low	Function	<p>The guestroom is spacious enough, and its sound-proofing is good. Bed is very comfortable, and the bathroom has all toiletries (which are free of charge). Highly recommended!</p>

## Appendix II. Sample reviews used in the experiment


**Sample 1** (High review breadth; High review depth; Emotional language; High reviewer expertise; High reviewer reputation)




**TGK**




**40** reviews were contributed by TGK



**40 / 40** reviews contributed by TGK received helpful vote(s)



**Expert Reviewer**  
30+ reviews were contributed



**Reputable Reviewer**  
80%+ reviews were helpful

### Live like King and Queen !!!


Posted 18 June 2017

Recently stayed here for two nights, and we were treated like royalty from start to finish. Fabulous location that no hotel can compare - a stone's throw away from the central train station; steps away from major attractions and restaurants.


The guestroom is bigger than in a palace, and soooooo comfortable. Bed is like heaven and perfect for rejuvenation. Good sound-proofing - we are completely shielded from the outside noise once the door is closed.

This hotel is the epitome of excellent guest service. All staff at this hotel are friendly and helpful, and they will pamper you throughout your stay. Can't recommend this place highly enough!


**Sample 2** (High review breadth; High review depth; Functional language; Low reviewer expertise; High reviewer reputation)




**TGK**



**4** reviews were contributed by TGK



**4 / 4** reviews contributed by TGK received helpful vote(s)



**Reputable Reviewer**  
80%+ reviews were helpful

### Excellent experience

Posted 18 June 2017

Recently stayed here for two nights, and our experience was simply wonderful. The hotel is in a good location – right next to the central train station and all major attractions and restaurants are just a few minutes away.

The guestroom is very spacious and comfortable. Bed is also comfortable, which is perfect after a long day of sightseeing. The sound-proofing is good as we heard no noise from the street, staff or other guests during the night.

The customer service is excellent. All staff at this hotel are friendly and helpful, and they do their best to make your stay a wonderful experience. Highly recommend this hotel to anyone.

**Sample 3** (High review breadth; Low review depth; Emotional language; High reviewer expertise; Low reviewer reputation)



TGK



40 reviews were contributed by TGK



10 / 40 reviews contributed by TGK received helpful vote(s)



### Live like King and Queen !!!

Posted 18 June 2017

Great location - a stone's throw away from central train station. Room is bigger than in a palace with veryyyyyyyy comfortable bed. Lost for words as to their impeccable service. Highly recommended!

**Sample 4** (Low review breadth; Low review depth; Functional language; Low reviewer expertise; Low reviewer reputation)



TGK



4 reviews were contributed by TGK



1 / 4 reviews contributed by TGK received helpful vote(s)

### Great Place

Posted 18 June 2017

The guestroom is spacious enough, and its sound-proofing is good. Bed is very comfortable, and the bathroom has all toiletries (which are free of charge). Highly recommended!

### Appendix III. Demographic profile of all participants

Variable / Sub-group	Freq.	Percent
<b>Gender</b>		
Male	544	47.7%
Female	596	52.3%
<b>Age group</b>		
18 – 25	179	15.7%
26 – 35	367	32.2%
36 – 45	233	20.4%
46 – 55	174	15.3%
56 – 65	123	10.8%
66 or above	64	5.6%
<b>Before making a hotel booking, you rely on online reviews ...</b>		
1: Not at all	9	0.8%
2	15	1.3%
3	70	6.1%
4	206	18.1%
5	412	36.1%
6	428	37.5%
7: Very much	0	0%
<b>Before making a hotel booking, the number of reviews you read is approximately ...</b>		
1 – 5	497	43.6%
6 – 10	368	32.3%
11 – 15	105	9.2%
16 – 20	80	7.0%
21 – 25	23	2.0%
26 – 30	19	1.7%
31 – 35	6	0.5%
36 – 40	10	0.9%
41 or above	32	2.8%

## Appendix IV. Script and output of confirmatory factor analysis using Mplus

### INPUT INSTRUCTIONS

#### TITLE:

Study 3 - Review Usefulness

#### DATA:

FILE IS Study3\_dataset2.dat;  
LISTWISE = ON;

#### VARIABLE:

NAMES = C1-C4 R1-R4 U1-U3 A1-A3;  
USEV = C1-C4 R1-R4 U1-U3 A1-A3;

#### ANALYSIS:

ESTIMATOR = MLR;  
TYPE = GENERAL;  
INFORMATION = EXPECTED;

#### MODEL:

CONTENT BY C1 C2 C3 C4; ! Review Content Quality;  
CREDIBILITY BY R1 R2 R3 R4; ! Reviewer Credibility;  
USEFULNESS BY U1 U2 U3; ! Reviewer usefulness;  
ADOPTION BY A1 A2 A3; ! Reviewer adoption;

#### OUTPUT:

STDYX TECH1 TECH4 STDYX MOD;

INPUT READING TERMINATED NORMALLY

Study 3 - Review Usefulness

### SUMMARY OF ANALYSIS

Number of groups	1
Number of observations	1140
Number of dependent variables	14
Number of independent variables	0
Number of continuous latent variables	4

### Observed dependent variables

#### Continuous

C1	C2	C3	C4	R1	R2
R3	R4	U1	U2	U3	A1

A2 A3

Continuous latent variables

CONTENT CREDIBIL USEFULNE ADOPTION

Estimator	MLR	
Information matrix	EXPECTED	
Maximum number of iterations		1000
Convergence criterion	0.500D-04	
Maximum number of steepest descent iterations		20

Input data file(s)

Study3\_dataset2.dat

Input data format FREE

THE MODEL ESTIMATION TERMINATED NORMALLY

MODEL FIT INFORMATION

Number of Free Parameters 48

Loglikelihood

H0 Value	-21259.814
H0 Scaling Correction Factor	1.8207
for MLR	
H1 Value	-20583.459
H1 Scaling Correction Factor	1.8384
for MLR	

Information Criteria

Akaike (AIC)	42615.628
Bayesian (BIC)	42857.489
Sample-Size Adjusted BIC	42705.027
( $n^* = (n + 2) / 24$ )	

Chi-Square Test of Model Fit

Value	731.021*
Degrees of Freedom	71
P-Value	0.0000
Scaling Correction Factor	1.8504
for MLR	

\* The chi-square value for MLM, MLMV, MLR, ULSMV, WLSM and WLSMV cannot be used for chi-square difference testing in the regular way. MLM, MLR and WLSM chi-square difference testing is described on the Mplus website. MLMV, WLSMV, and ULSMV difference testing is done using the DIFFTEST option.

## RMSEA (Root Mean Square Error Of Approximation)

Estimate	0.090
90 Percent C.I.	0.084 0.096
Probability RMSEA <= .05	0.000

## CFI/TLI

CFI	0.922
TLI	0.900

## Chi-Square Test of Model Fit for the Baseline Model

Value	8567.655
Degrees of Freedom	91
P-Value	0.0000

## SRMR (Standardized Root Mean Square Residual)

Value	0.050
-------	-------

## MODEL RESULTS

	Estimate	S.E.	Two-Tailed Est./S.E.	P-Value
<b>CONTENT BY</b>				
C1	1.000	0.000	999.000	999.000
C2	0.856	0.033	25.562	0.000
C3	1.316	0.052	25.088	0.000
C4	1.310	0.051	25.855	0.000
<b>CREDIBIL BY</b>				
R1	1.000	0.000	999.000	999.000
R2	0.983	0.038	25.749	0.000
R3	1.130	0.040	28.278	0.000
R4	1.176	0.039	30.052	0.000
<b>USEFULNE BY</b>				
U1	1.000	0.000	999.000	999.000
U2	1.033	0.018	57.749	0.000
U3	1.017	0.019	54.404	0.000
<b>ADOPTION BY</b>				
A1	1.000	0.000	999.000	999.000
A2	1.076	0.036	29.761	0.000
A3	1.111	0.035	31.554	0.000
<b>CREDIBIL WITH CONTENT</b>				
	1.091	0.080	13.705	0.000



USEFULNE WITH				
CONTENT	1.320	0.084	15.745	0.000
CREDIBILIT	1.288	0.078	16.550	0.000

ADOPTION WITH				
CONTENT	1.336	0.081	16.588	0.000
CREDIBILIT	1.244	0.071	17.502	0.000
USEFULNESS	1.690	0.096	17.642	0.000

## Intercepts

C1	5.682	0.045	127.165	0.000
C2	5.871	0.041	141.986	0.000
C3	5.450	0.048	113.017	0.000
C4	5.381	0.048	112.314	0.000
R1	5.523	0.041	135.081	0.000
R2	4.606	0.046	101.090	0.000
R3	5.145	0.041	126.220	0.000
R4	5.176	0.042	122.000	0.000
U1	4.746	0.050	95.509	0.000
U2	4.597	0.049	93.083	0.000
U3	4.518	0.050	91.163	0.000
A1	4.789	0.048	98.749	0.000
A2	5.400	0.044	121.773	0.000
A3	5.401	0.046	117.886	0.000

## Variances

CONTENT	1.342	0.108	12.427	0.000
CREDIBILIT	1.251	0.088	14.295	0.000
USEFULNESS	2.349	0.111	21.223	0.000
ADOPTION	1.670	0.103	16.183	0.000

## Residual Variances

C1	0.934	0.073	12.714	0.000
C2	0.965	0.076	12.714	0.000
C3	0.326	0.031	10.417	0.000
C4	0.313	0.036	8.655	0.000
R1	0.654	0.046	14.275	0.000
R2	1.157	0.081	14.359	0.000
R3	0.295	0.028	10.435	0.000
R4	0.320	0.042	7.683	0.000
U1	0.467	0.050	9.346	0.000
U2	0.274	0.039	7.040	0.000
U3	0.370	0.040	9.183	0.000
A1	1.011	0.065	15.558	0.000
A2	0.308	0.039	7.944	0.000
A3	0.333	0.039	8.542	0.000

## STANDARDIZED MODEL RESULTS

## STDYX Standardization

	Estimate	S.E.	Two-Tailed Est./S.E.	P-Value
<b>CONTENT BY</b>				
C1	0.768	0.020	38.499	0.000
C2	0.711	0.022	31.771	0.000
C3	0.937	0.007	143.953	0.000
C4	0.938	0.008	120.929	0.000
<b>CREDIBIL BY</b>				
R1	0.810	0.015	52.319	0.000
R2	0.715	0.022	32.769	0.000
R3	0.919	0.009	107.334	0.000
R4	0.919	0.011	82.669	0.000
<b>USEFULNE BY</b>				
U1	0.913	0.010	90.654	0.000
U2	0.949	0.007	127.362	0.000
U3	0.932	0.008	118.104	0.000
<b>ADOPTION BY</b>				
A1	0.789	0.016	50.094	0.000
A2	0.929	0.010	95.682	0.000
A3	0.928	0.009	106.914	0.000
<b>CREDIBIL WITH</b>				
CONTENT	0.842	0.014	59.747	0.000
<b>USEFULNE WITH</b>				
CONTENT	0.744	0.018	40.867	0.000
CREDIBILIT	0.752	0.020	37.992	0.000
<b>ADOPTION WITH</b>				
CONTENT	0.892	0.013	69.869	0.000
CREDIBILIT	0.861	0.014	61.648	0.000
USEFULNESS	0.854	0.012	69.096	0.000
<b>Intercepts</b>				
C1	3.766	0.116	32.399	0.000
C2	4.205	0.141	29.835	0.000
C3	3.347	0.098	34.164	0.000
C4	3.326	0.093	35.725	0.000
R1	4.001	0.111	36.166	0.000
R2	2.994	0.073	40.808	0.000
R3	3.738	0.094	39.784	0.000
R4	3.613	0.093	38.717	0.000
U1	2.829	0.070	40.667	0.000
U2	2.757	0.064	42.881	0.000
U3	2.700	0.062	43.450	0.000
A1	2.925	0.070	42.029	0.000
A2	3.607	0.109	33.150	0.000

A3            3.491    0.105    33.261    0.000

Variiances

CONTENT	1.000	0.000	999.000	999.000
CREDIBILIT	1.000	0.000	999.000	999.000
USEFULNESS	1.000	0.000	999.000	999.000
ADOPTION	1.000	0.000	999.000	999.000

Residual Variiances

C1	0.410	0.031	13.403	0.000
C2	0.495	0.032	15.582	0.000
C3	0.123	0.012	10.079	0.000
C4	0.120	0.015	8.229	0.000
R1	0.343	0.025	13.673	0.000
R2	0.489	0.031	15.662	0.000
R3	0.156	0.016	9.900	0.000
R4	0.156	0.020	7.640	0.000
U1	0.166	0.018	9.012	0.000
U2	0.099	0.014	6.966	0.000
U3	0.132	0.015	8.980	0.000
A1	0.377	0.025	15.168	0.000
A2	0.137	0.018	7.614	0.000
A3	0.139	0.016	8.631	0.000

R-SQUARE

Variable	Observed Estimate	Two-Tailed		
		S.E.	Est./S.E.	P-Value
C1	0.590	0.031	19.249	0.000
C2	0.505	0.032	15.886	0.000
C3	0.877	0.012	71.977	0.000
C4	0.880	0.015	60.464	0.000
R1	0.657	0.025	26.160	0.000
R2	0.511	0.031	16.385	0.000
R3	0.844	0.016	53.667	0.000
R4	0.844	0.020	41.334	0.000
U1	0.834	0.018	45.327	0.000
U2	0.901	0.014	63.681	0.000
U3	0.868	0.015	59.052	0.000
A1	0.623	0.025	25.047	0.000
A2	0.863	0.018	47.841	0.000
A3	0.861	0.016	53.457	0.000

QUALITY OF NUMERICAL RESULTS

Condition Number for the Information Matrix            0.864E-03  
 (ratio of smallest to largest eigenvalue)

MODEL MODIFICATION INDICES

NOTE: Modification indices for direct effects of observed dependent variables regressed on covariates may not be included. To include these, request MODINDICES (ALL).

Minimum M.I. value for printing the modification index 10.000

M.I. E.P.C. Std E.P.C. StdYX E.P.C.

#### BY Statements

CONTENT BY R1	97.822	0.676	0.783	0.567
CONTENT BY R3	17.661	-0.257	-0.297	-0.216
CONTENT BY R4	15.483	-0.250	-0.290	-0.202
CONTENT BY U1	33.530	0.267	0.309	0.184
CREDIBIL BY U1	11.366	0.165	0.185	0.110
USEFULNE BY R1	20.505	0.176	0.269	0.195
USEFULNE BY R2	14.226	0.186	0.285	0.185
USEFULNE BY A1	276.648	1.052	1.613	0.985
USEFULNE BY A2	27.322	-0.248	-0.379	-0.253
USEFULNE BY A3	40.322	-0.311	-0.476	-0.308
ADOPTION BY R1	57.738	0.508	0.657	0.476
ADOPTION BY R3	12.040	-0.213	-0.275	-0.200
ADOPTION BY R4	17.895	-0.270	-0.349	-0.244
ADOPTION BY U1	25.835	0.293	0.378	0.226

#### WITH Statements

C2 WITH C1	55.234	0.305	0.305	0.321
C3 WITH C1	11.320	-0.106	-0.106	-0.193
C4 WITH C3	32.761	0.217	0.217	0.679
R1 WITH C1	44.431	0.230	0.230	0.294
R1 WITH C2	12.615	0.123	0.123	0.155
R2 WITH R1	36.748	0.237	0.237	0.273
R3 WITH C1	12.352	-0.093	-0.093	-0.176
R3 WITH R1	41.460	-0.170	-0.170	-0.388
R4 WITH R1	31.119	-0.154	-0.154	-0.336
R4 WITH R2	12.135	-0.115	-0.115	-0.189
R4 WITH R3	161.020	0.372	0.372	1.209
U3 WITH U2	21.670	0.177	0.177	0.557
A1 WITH R2	11.753	0.160	0.160	0.148
A1 WITH U2	28.165	0.150	0.150	0.284
A1 WITH U3	15.561	0.119	0.119	0.195
A2 WITH C4	10.041	-0.060	-0.060	-0.194
A2 WITH U2	11.773	-0.062	-0.062	-0.214
A2 WITH A1	36.496	-0.186	-0.186	-0.333
A3 WITH A1	33.777	-0.185	-0.185	-0.319
A3 WITH A2	138.050	0.398	0.398	1.245

#### TECHNICAL 1 OUTPUT

##### PARAMETER SPECIFICATION

NU		C1	C2	C3	C4	R1	
1		1	2	3	4	5	

NU		R2	R3	R4	U1	U2	
1		6	7	8	9	10	

NU		U3	A1	A2	A3	
1		11	12	13	14	

LAMBDA				
	CONTENT	CREDIBIL	USEFULNE	ADOPTION
C1	0	0	0	0
C2	15	0	0	0
C3	16	0	0	0
C4	17	0	0	0
R1	0	0	0	0
R2	0	18	0	0
R3	0	19	0	0
R4	0	20	0	0
U1	0	0	0	0
U2	0	0	21	0
U3	0	0	22	0
A1	0	0	0	0
A2	0	0	0	23
A3	0	0	0	24

THETA					
	C1	C2	C3	C4	R1
C1	25				
C2	0	26			
C3	0	0	27		
C4	0	0	0	28	
R1	0	0	0	0	29
R2	0	0	0	0	0
R3	0	0	0	0	0
R4	0	0	0	0	0
U1	0	0	0	0	0
U2	0	0	0	0	0
U3	0	0	0	0	0
A1	0	0	0	0	0
A2	0	0	0	0	0
A3	0	0	0	0	0

THETA

	R2	R3	R4	U1	U2
R2	30				
R3	0	31			
R4	0	0	32		
U1	0	0	0	33	
U2	0	0	0	0	34
U3	0	0	0	0	0
A1	0	0	0	0	0
A2	0	0	0	0	0
A3	0	0	0	0	0

THETA

	U3	A1	A2	A3
U3	35			
A1	0	36		
A2	0	0	37	
A3	0	0	0	38

ALPHA

	CONTENT	CREDIBIL	USEFULNE	ADOPTION
1	0	0	0	0

BETA

	CONTENT	CREDIBIL	USEFULNE	ADOPTION
CONTENT	0	0	0	0
CREDIBIL	0	0	0	0
USEFULNE	0	0	0	0
ADOPTION	0	0	0	0

PSI

	CONTENT	CREDIBIL	USEFULNE	ADOPTION
CONTENT	39			
CREDIBIL	40	41		
USEFULNE	42	43	44	
ADOPTION	45	46	47	48

STARTING VALUES

NU

	C1	C2	C3	C4	R1
1	5.682	5.871	5.450	5.381	5.523

NU

	R2	R3	R4	U1	U2
--	----	----	----	----	----

1	4.606	5.145	5.176	4.746	4.597
---	-------	-------	-------	-------	-------

NU

	U3	A1	A2	A3
--	----	----	----	----

1	4.518	4.789	5.400	5.401
---	-------	-------	-------	-------

LAMBDA

	CONTENT	CREDIBIL	USEFULNE	ADOPTION
--	---------	----------	----------	----------

C1	1.000	0.000	0.000	0.000
C2	0.861	0.000	0.000	0.000
C3	1.221	0.000	0.000	0.000
C4	1.225	0.000	0.000	0.000
R1	0.000	1.000	0.000	0.000
R2	0.000	0.995	0.000	0.000
R3	0.000	1.112	0.000	0.000
R4	0.000	1.156	0.000	0.000
U1	0.000	0.000	1.000	0.000
U2	0.000	0.000	1.052	0.000
U3	0.000	0.000	1.030	0.000
A1	0.000	0.000	0.000	1.000
A2	0.000	0.000	0.000	1.170
A3	0.000	0.000	0.000	1.210

THETA

	C1	C2	C3	C4	R1
--	----	----	----	----	----

C1	1.138				
C2	0.000	0.975			
C3	0.000	0.000	1.326		
C4	0.000	0.000	0.000	1.308	
R1	0.000	0.000	0.000	0.000	0.953
R2	0.000	0.000	0.000	0.000	0.000
R3	0.000	0.000	0.000	0.000	0.000
R4	0.000	0.000	0.000	0.000	0.000
U1	0.000	0.000	0.000	0.000	0.000
U2	0.000	0.000	0.000	0.000	0.000
U3	0.000	0.000	0.000	0.000	0.000
A1	0.000	0.000	0.000	0.000	0.000
A2	0.000	0.000	0.000	0.000	0.000
A3	0.000	0.000	0.000	0.000	0.000

THETA

	R2	R3	R4	U1	U2
--	----	----	----	----	----

R2	1.183				
R3	0.000	0.947			
R4	0.000	0.000	1.026		
U1	0.000	0.000	0.000	1.408	
U2	0.000	0.000	0.000	0.000	1.390

U3	0.000	0.000	0.000	0.000	0.000
A1	0.000	0.000	0.000	0.000	0.000
A2	0.000	0.000	0.000	0.000	0.000
A3	0.000	0.000	0.000	0.000	0.000

THETA

	U3	A1	A2	A3
U3	1.400			
A1	0.000	1.340		
A2	0.000	0.000	1.121	
A3	0.000	0.000	0.000	1.196

ALPHA

	CONTENT	CREDIBIL	USEFULNE	ADOPTION
1	0.000	0.000	0.000	0.000

BETA

	CONTENT	CREDIBIL	USEFULNE	ADOPTION
CONTENT	0.000	0.000	0.000	0.000
CREDIBIL	0.000	0.000	0.000	0.000
USEFULNE	0.000	0.000	0.000	0.000
ADOPTION	0.000	0.000	0.000	0.000

PSI

	CONTENT	CREDIBIL	USEFULNE	ADOPTION
CONTENT	0.050			
CREDIBIL	0.000	0.050		
USEFULNE	0.000	0.000	0.050	
ADOPTION	0.000	0.000	0.000	0.050

TECHNICAL 4 OUTPUT

ESTIMATES DERIVED FROM THE MODEL

ESTIMATED MEANS FOR THE LATENT VARIABLES

	CONTENT	CREDIBIL	USEFULNE	ADOPTION
1	0.000	0.000	0.000	0.000

S.E. FOR ESTIMATED MEANS FOR THE LATENT VARIABLES

	CONTENT	CREDIBIL	USEFULNE	ADOPTION
1	0.000	0.000	0.000	0.000

EST./S.E. FOR ESTIMATED MEANS FOR THE LATENT VARIABLES

	CONTENT	CREDIBIL	USEFULNE	ADOPTION



1 0.000 0.000 0.000 0.000

TWO-TAILED P-VALUE FOR ESTIMATED MEANS FOR THE LATENT VARIABLES

CONTENT CREDIBIL USEFULNE ADOPTION

1 1.000 1.000 1.000 1.000

ESTIMATED COVARIANCE MATRIX FOR THE LATENT VARIABLES

CONTENT CREDIBIL USEFULNE ADOPTION

CONTENT	1.342			
CREDIBIL	1.091	1.251		
USEFULNE	1.320	1.288	2.349	
ADOPTION	1.336	1.244	1.690	1.670

S.E. FOR ESTIMATED COVARIANCE MATRIX FOR THE LATENT VARIABLES

CONTENT CREDIBIL USEFULNE ADOPTION

CONTENT	0.108			
CREDIBIL	0.080	0.088		
USEFULNE	0.084	0.078	0.111	
ADOPTION	0.081	0.071	0.096	0.103

EST./S.E. FOR ESTIMATED COVARIANCE MATRIX FOR THE LATENT VARIABLES

CONTENT CREDIBIL USEFULNE ADOPTION

CONTENT	12.427			
CREDIBIL	13.705	14.295		
USEFULNE	15.745	16.550	21.223	
ADOPTION	16.588	17.502	17.642	16.183

TWO-TAILED P-VALUE FOR ESTIMATED COVARIANCE MATRIX FOR THE LATENT VARIABLES

CONTENT CREDIBIL USEFULNE ADOPTION

CONTENT	0.000			
CREDIBIL	0.000	0.000		
USEFULNE	0.000	0.000	0.000	
ADOPTION	0.000	0.000	0.000	0.000

ESTIMATED CORRELATION MATRIX FOR THE LATENT VARIABLES

CONTENT CREDIBIL USEFULNE ADOPTION

CONTENT	1.000			
CREDIBIL	0.842	1.000		
USEFULNE	0.744	0.752	1.000	
ADOPTION	0.842	0.841	0.854	1.000

S.E. FOR ESTIMATED CORRELATION MATRIX FOR THE LATENT VARIABLES

CONTENT CREDIBIL USEFULNE ADOPTION

CONTENT 0.000

CREDIBIL	0.014	0.000		
USEFULNE	0.018	0.020	0.000	
ADOPTION	0.013	0.014	0.012	0.000

EST./S.E. FOR ESTIMATED CORRELATION MATRIX FOR THE LATENT VARIABLES

	CONTENT	CREDIBIL	USEFULNE	ADOPTION
CONTENT	999.000			
CREDIBIL	59.747	999.000		
USEFULNE	40.867	37.992	999.000	
ADOPTION	69.869	61.648	69.096	999.000

TWO-TAILED P-VALUE FOR ESTIMATED CORRELATION MATRIX FOR THE LATENT VARIABLES

	CONTENT	CREDIBIL	USEFULNE	ADOPTION
CONTENT	0.000			
CREDIBIL	0.000	0.000		
USEFULNE	0.000	0.000	0.000	
ADOPTION	0.000	0.000	0.000	0.000

## Appendix V. Script and output of structural equation modelling using Mplus

### INPUT INSTRUCTIONS

#### TITLE:

Study 3 - Review Usefulness

#### DATA:

FILE IS Study3\_dataset2.dat;  
LISTWISE = ON;

#### VARIABLE:

NAMES = C1-C4 R1-R4 U1-U3 A1-A3;  
USEV = C1-C4 R1-R4 U1-U3 A1-A3;

#### ANALYSIS:

ESTIMATOR = MLR;  
TYPE = GENERAL;  
INFORMATION = EXPECTED;

#### MODEL:

CONTENT BY C1 C2 C3 C4; ! Review Content Quality;  
CREDIBILITY BY R1 R2 R3 R4; ! Reviewer Credibility;  
USEFULNESS BY U1 U2 U3; ! Reviewer usefulness;  
ADOPTION BY A1 A2 A3; ! Reviewer adoption;

USEFULNESS ON CONTENT;  
USEFULNESS ON CREDIBILITY;  
ADOPTION ON USEFULNESS;

#### OUTPUT:

STDYX TECH1 TECH4 STDYX MOD;

### INPUT READING TERMINATED NORMALLY

Study 3 - Review Usefulness

### SUMMARY OF ANALYSIS

Number of groups	1
Number of observations	1140
Number of dependent variables	14
Number of independent variables	0
Number of continuous latent variables	4

## Observed dependent variables

## Continuous

C1	C2	C3	C4	R1	R2
R3	R4	U1	U2	U3	A1
A2	A3				

## Continuous latent variables

CONTENT	CREDIBIL	USEFULNE	ADOPTION
---------	----------	----------	----------

Estimator	MLR
Information matrix	EXPECTED
Maximum number of iterations	1000
Convergence criterion	0.500D-04
Maximum number of steepest descent iterations	20

## Input data file(s)

Study3\_dataset2.dat

## Input data format FREE

THE MODEL ESTIMATION TERMINATED NORMALLY

## MODEL FIT INFORMATION

Number of Free Parameters	46
---------------------------	----

## Loglikelihood

H0 Value	-21544.564
H0 Scaling Correction Factor	1.7396
for MLR	
H1 Value	-20583.459
H1 Scaling Correction Factor	1.8384
for MLR	

## Information Criteria

Akaike (AIC)	43181.128
Bayesian (BIC)	43412.912
Sample-Size Adjusted BIC	43266.802
( $n^* = (n + 2) / 24$ )	

## Chi-Square Test of Model Fit

Value	1011.315*
Degrees of Freedom	73
P-Value	0.0000
Scaling Correction Factor	1.9007

for MLR

\* The chi-square value for MLM, MLMV, MLR, ULSMV, WLSM and WLSMV cannot be used for chi-square difference testing in the regular way. MLM, MLR and WLSM chi-square difference testing is described on the Mplus website. MLMV, WLSMV, and ULSMV difference testing is done using the DIFFTEST option.

RMSEA (Root Mean Square Error Of Approximation)

Estimate	0.106
90 Percent C.I.	0.100 0.112
Probability RMSEA <= .05	0.000

CFI/TLI

CFI	0.889
TLI	0.862

Chi-Square Test of Model Fit for the Baseline Model

Value	8567.655
Degrees of Freedom	91
P-Value	0.0000

SRMR (Standardized Root Mean Square Residual)

Value	0.079
-------	-------

MODEL RESULTS

	Estimate	S.E.	Two-Tailed Est./S.E.	P-Value
CONTENT BY				
C1	1.000	0.000	999.000	999.000
C2	0.860	0.034	25.273	0.000
C3	1.317	0.053	24.965	0.000
C4	1.315	0.051	25.546	0.000
CREDIBIL BY				
R1	1.000	0.000	999.000	999.000
R2	0.984	0.038	25.753	0.000
R3	1.131	0.040	28.410	0.000
R4	1.179	0.039	30.420	0.000
USEFULNE BY				
U1	1.000	0.000	999.000	999.000
U2	1.013	0.016	61.477	0.000
U3	1.000	0.018	57.130	0.000

ADOPTION BY

A1	1.000	0.000	999.000	999.000
A2	1.057	0.036	29.546	0.000
A3	1.089	0.035	30.929	0.000

## USEFULNE ON

CONTENT	0.568	0.067	8.470	0.000
CREDIBILIT	0.591	0.068	8.676	0.000

## ADOPTION ON

USEFULNESS	0.757	0.023	33.381	0.000
------------	-------	-------	--------	-------

## CREDIBIL WITH

CONTENT	1.087	0.079	13.684	0.000
---------	-------	-------	--------	-------

## Intercepts

C1	5.682	0.045	127.165	0.000
C2	5.871	0.041	141.986	0.000
C3	5.450	0.048	113.017	0.000
C4	5.381	0.048	112.314	0.000
R1	5.523	0.041	135.081	0.000
R2	4.606	0.046	101.090	0.000
R3	5.145	0.041	126.220	0.000
R4	5.176	0.042	122.000	0.000
U1	4.746	0.050	95.509	0.000
U2	4.597	0.049	93.083	0.000
U3	4.518	0.050	91.163	0.000
A1	4.789	0.048	98.749	0.000
A2	5.400	0.044	121.773	0.000
A3	5.401	0.046	117.886	0.000

## Variances

CONTENT	1.336	0.108	12.352	0.000
CREDIBILIT	1.249	0.087	14.323	0.000

## Residual Variances

C1	0.940	0.074	12.756	0.000
C2	0.962	0.076	12.733	0.000
C3	0.332	0.035	9.579	0.000
C4	0.305	0.036	8.594	0.000
R1	0.657	0.045	14.481	0.000
R2	1.157	0.080	14.404	0.000
R3	0.297	0.029	10.066	0.000
R4	0.316	0.041	7.713	0.000
U1	0.439	0.047	9.395	0.000
U2	0.339	0.038	8.880	0.000
U3	0.423	0.039	10.814	0.000
A1	0.963	0.063	15.181	0.000
A2	0.322	0.039	8.286	0.000
A3	0.357	0.046	7.834	0.000
USEFULNESS	0.780	0.059	13.216	0.000
ADOPTION	0.354	0.029	12.263	0.000

## STANDARDIZED MODEL RESULTS

## STDYX Standardization

	Estimate	S.E.	Two-Tailed Est./S.E.	P-Value
<b>CONTENT BY</b>				
C1	0.766	0.020	38.157	0.000
C2	0.712	0.022	31.931	0.000
C3	0.935	0.007	130.944	0.000
C4	0.940	0.008	123.661	0.000
<b>CREDIBIL BY</b>				
R1	0.810	0.015	52.725	0.000
R2	0.715	0.022	32.849	0.000
R3	0.918	0.009	103.525	0.000
R4	0.920	0.011	84.310	0.000
<b>USEFULNE BY</b>				
U1	0.919	0.009	98.341	0.000
U2	0.937	0.007	125.868	0.000
U3	0.921	0.008	118.146	0.000
<b>ADOPTION BY</b>				
A1	0.800	0.015	52.187	0.000
A2	0.925	0.010	94.367	0.000
A3	0.923	0.010	90.625	0.000
<b>USEFULNE ON</b>				
CONTENT	0.426	0.047	9.047	0.000
CREDIBILIT	0.428	0.047	9.019	0.000
<b>ADOPTION ON</b>				
USEFULNESS	0.891	0.010	89.337	0.000
<b>CREDIBIL WITH</b>				
CONTENT	0.842	0.014	59.448	0.000
<b>Intercepts</b>				
C1	3.766	0.116	32.398	0.000
C2	4.205	0.141	29.835	0.000
C3	3.347	0.098	34.164	0.000
C4	3.326	0.093	35.725	0.000
R1	4.001	0.111	36.166	0.000
R2	2.994	0.073	40.808	0.000
R3	3.738	0.094	39.784	0.000
R4	3.613	0.093	38.717	0.000
U1	2.829	0.070	40.668	0.000
U2	2.757	0.064	42.881	0.000
U3	2.700	0.062	43.450	0.000
A1	2.925	0.070	42.029	0.000

A2	3.607	0.109	33.150	0.000
A3	3.491	0.105	33.261	0.000

## Variances

CONTENT	1.000	0.000	999.000	999.000
CREDIBILIT	1.000	0.000	999.000	999.000

## Residual Variances

C1	0.413	0.031	13.425	0.000
C2	0.493	0.032	15.554	0.000
C3	0.125	0.013	9.375	0.000
C4	0.117	0.014	8.169	0.000
R1	0.345	0.025	13.865	0.000
R2	0.489	0.031	15.719	0.000
R3	0.157	0.016	9.610	0.000
R4	0.154	0.020	7.663	0.000
U1	0.156	0.017	9.075	0.000
U2	0.122	0.014	8.749	0.000
U3	0.151	0.014	10.513	0.000
A1	0.359	0.025	14.638	0.000
A2	0.144	0.018	7.913	0.000
A3	0.149	0.019	7.933	0.000
USEFULNESS	0.328	0.024	13.556	0.000
ADOPTION	0.206	0.018	11.614	0.000

## R-SQUARE

Observed Variable	Estimate	S.E.	Two-Tailed	
			Est./S.E.	P-Value
C1	0.587	0.031	19.078	0.000
C2	0.507	0.032	15.965	0.000
C3	0.875	0.013	65.472	0.000
C4	0.883	0.014	61.830	0.000
R1	0.655	0.025	26.362	0.000
R2	0.511	0.031	16.424	0.000
R3	0.843	0.016	51.762	0.000
R4	0.846	0.020	42.155	0.000
U1	0.844	0.017	49.170	0.000
U2	0.878	0.014	62.934	0.000
U3	0.849	0.014	59.073	0.000
A1	0.641	0.025	26.093	0.000
A2	0.856	0.018	47.183	0.000
A3	0.851	0.019	45.312	0.000

Latent Variable	Estimate	S.E.	Two-Tailed	
			Est./S.E.	P-Value
USEFULNE	0.672	0.024	27.765	0.000
ADOPTION	0.794	0.018	44.668	0.000



## QUALITY OF NUMERICAL RESULTS

Condition Number for the Information Matrix      0.269E-02  
(ratio of smallest to largest eigenvalue)

## MODEL MODIFICATION INDICES

NOTE: Modification indices for direct effects of observed dependent variables regressed on covariates may not be included. To include these, request MODINDICES (ALL).

Minimum M.I. value for printing the modification index    10.000

M.I.    E.P.C.   Std E.P.C.   StdYX   E.P.C.

## BY Statements

CONTENT BY R1	94.952	0.676	0.781	0.566
CONTENT BY R3	16.698	-0.253	-0.293	-0.213
CONTENT BY R4	15.606	-0.255	-0.295	-0.206
CONTENT BY U2	39.182	-0.299	-0.346	-0.208
CONTENT BY U3	47.399	-0.344	-0.398	-0.238
CONTENT BY A2	27.430	0.216	0.250	0.167
CONTENT BY A3	41.267	0.275	0.318	0.206
CREDIBIL BY U2	29.484	-0.272	-0.304	-0.183
CREDIBIL BY U3	16.438	-0.213	-0.237	-0.142
CREDIBIL BY A2	26.873	0.224	0.250	0.167
CREDIBIL BY A3	14.733	0.172	0.192	0.124
USEFULNE BY R1	26.481	0.220	0.339	0.245
USEFULNE BY R2	13.716	0.200	0.309	0.201
USEFULNE BY R3	10.580	-0.119	-0.184	-0.134
USEFULNE BY A1	298.025	1.384	2.133	1.303
USEFULNE BY A2	56.587	-0.584	-0.900	-0.601
USEFULNE BY A3	68.412	-0.660	-1.017	-0.657
ADOPTION BY R1	27.520	0.221	0.290	0.210
ADOPTION BY U2	36.489	-0.416	-0.546	-0.327
ADOPTION BY U3	22.260	-0.334	-0.438	-0.262

## ON/BY Statements

CONTENT ON ADOPTION / ADOPTION BY CONTENT	29.093	0.352	0.399	0.399
USEFULNE ON ADOPTION / ADOPTION BY USEFULNE	264.092	-1.684	-1.431	-1.431
ADOPTION ON CONTENT / CONTENT BY ADOPTION	245.304	0.752	0.663	0.663
ADOPTION ON CREDIBIL / CREDIBIL BY ADOPTION	185.254	0.685	0.584	0.584

## WITH Statements

C2    WITH C1	54.315	0.308	0.308	0.324
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C4	WITH C3	37.385	0.261	0.261	0.821
R1	WITH C1	44.321	0.235	0.235	0.299
R1	WITH C2	12.221	0.123	0.123	0.155
R2	WITH R1	36.397	0.240	0.240	0.276
R3	WITH C1	10.967	-0.089	-0.089	-0.169
R3	WITH R1	38.712	-0.170	-0.170	-0.385
R4	WITH R1	32.314	-0.161	-0.161	-0.355
R4	WITH R2	12.921	-0.121	-0.121	-0.201
R4	WITH R3	163.699	0.393	0.393	1.283
U3	WITH C3	10.289	-0.069	-0.069	-0.185
U3	WITH U2	96.166	0.290	0.290	0.766
A1	WITH U1	24.001	0.157	0.157	0.242
A1	WITH U2	49.602	0.209	0.209	0.366
A1	WITH U3	29.968	0.173	0.173	0.271
A2	WITH C3	14.795	0.078	0.078	0.238
A2	WITH U2	33.558	-0.120	-0.120	-0.362
A2	WITH A1	68.419	-0.300	-0.300	-0.538
A3	WITH C4	20.792	0.094	0.094	0.285
A3	WITH U2	13.725	-0.080	-0.080	-0.229
A3	WITH U3	27.194	-0.118	-0.118	-0.305
A3	WITH A1	56.583	-0.281	-0.281	-0.480
A3	WITH A2	298.020	0.746	0.746	2.201
ADOPTION WITH CONTENT		29.097	0.125	0.181	0.181
ADOPTION WITH USEFULNE		264.095	-0.597	-1.135	-1.135

## TECHNICAL 1 OUTPUT

## PARAMETER SPECIFICATION

NU					
	C1	C2	C3	C4	R1
1	1	2	3	4	5
NU					
	R2	R3	R4	U1	U2
1	6	7	8	9	10
NU					
	U3	A1	A2	A3	
1	11	12	13	14	
LAMBDA					
	CONTENT	CREDIBIL	USEFULNE	ADOPTION	
C1	0	0	0	0	
C2	15	0	0	0	
C3	16	0	0	0	
C4	17	0	0	0	
R1	0	0	0	0	

R2	0	18	0	0
R3	0	19	0	0
R4	0	20	0	0
U1	0	0	0	0
U2	0	0	21	0
U3	0	0	22	0
A1	0	0	0	0
A2	0	0	0	23
A3	0	0	0	24

THETA

	C1	C2	C3	C4	R1
C1	25				
C2	0	26			
C3	0	0	27		
C4	0	0	0	28	
R1	0	0	0	0	29
R2	0	0	0	0	0
R3	0	0	0	0	0
R4	0	0	0	0	0
U1	0	0	0	0	0
U2	0	0	0	0	0
U3	0	0	0	0	0
A1	0	0	0	0	0
A2	0	0	0	0	0
A3	0	0	0	0	0

THETA

	R2	R3	R4	U1	U2
R2	30				
R3	0	31			
R4	0	0	32		
U1	0	0	0	33	
U2	0	0	0	0	34
U3	0	0	0	0	0
A1	0	0	0	0	0
A2	0	0	0	0	0
A3	0	0	0	0	0

THETA

	U3	A1	A2	A3
U3	35			
A1	0	36		
A2	0	0	37	
A3	0	0	0	38

ALPHA

CONTENT	CREDIBIL	USEFULNE	ADOPTION
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---

1 0 0 0 0

BETA

	CONTENT	CREDIBIL	USEFULNE	ADOPTION
CONTENT	0	0	0	0
CREDIBIL	0	0	0	0
USEFULNE	39	40	0	0
ADOPTION	0	0	41	0

PSI

	CONTENT	CREDIBIL	USEFULNE	ADOPTION
CONTENT	42			
CREDIBIL	43	44		
USEFULNE	0	0	45	
ADOPTION	0	0	0	46

STARTING VALUES

NU

	C1	C2	C3	C4	R1
1	5.682	5.871	5.450	5.381	5.523

NU

	R2	R3	R4	U1	U2
1	4.606	5.145	5.176	4.746	4.597

NU

	U3	A1	A2	A3
1	4.518	4.789	5.400	5.401

LAMBDA

	CONTENT	CREDIBIL	USEFULNE	ADOPTION
C1	1.000	0.000	0.000	0.000
C2	0.861	0.000	0.000	0.000
C3	1.221	0.000	0.000	0.000
C4	1.225	0.000	0.000	0.000
R1	0.000	1.000	0.000	0.000
R2	0.000	0.995	0.000	0.000
R3	0.000	1.112	0.000	0.000
R4	0.000	1.156	0.000	0.000
U1	0.000	0.000	1.000	0.000
U2	0.000	0.000	1.052	0.000
U3	0.000	0.000	1.030	0.000
A1	0.000	0.000	0.000	1.000
A2	0.000	0.000	0.000	1.170
A3	0.000	0.000	0.000	1.210

THETA

	C1	C2	C3	C4	R1
C1	1.138				
C2	0.000	0.975			
C3	0.000	0.000	1.326		
C4	0.000	0.000	0.000	1.308	
R1	0.000	0.000	0.000	0.000	0.953
R2	0.000	0.000	0.000	0.000	0.000
R3	0.000	0.000	0.000	0.000	0.000
R4	0.000	0.000	0.000	0.000	0.000
U1	0.000	0.000	0.000	0.000	0.000
U2	0.000	0.000	0.000	0.000	0.000
U3	0.000	0.000	0.000	0.000	0.000
A1	0.000	0.000	0.000	0.000	0.000
A2	0.000	0.000	0.000	0.000	0.000
A3	0.000	0.000	0.000	0.000	0.000

THETA

	R2	R3	R4	U1	U2
R2	1.183				
R3	0.000	0.947			
R4	0.000	0.000	1.026		
U1	0.000	0.000	0.000	1.408	
U2	0.000	0.000	0.000	0.000	1.390
U3	0.000	0.000	0.000	0.000	0.000
A1	0.000	0.000	0.000	0.000	0.000
A2	0.000	0.000	0.000	0.000	0.000
A3	0.000	0.000	0.000	0.000	0.000

THETA

	U3	A1	A2	A3
U3	1.400			
A1	0.000	1.340		
A2	0.000	0.000	1.121	
A3	0.000	0.000	0.000	1.196

ALPHA

	CONTENT	CREDIBIL	USEFULNE	ADOPTION
1	0.000	0.000	0.000	0.000

BETA

	CONTENT	CREDIBIL	USEFULNE	ADOPTION
CONTENT	0.000	0.000	0.000	0.000
CREDIBIL	0.000	0.000	0.000	0.000
USEFULNE	0.000	0.000	0.000	0.000
ADOPTION	0.000	0.000	0.000	0.000

PSI

	CONTENT	CREDIBIL	USEFULNE	ADOPTION
CONTENT	0.050			
CREDIBIL	0.000	0.050		
USEFULNE	0.000	0.000	0.050	
ADOPTION	0.000	0.000	0.000	0.050

TECHNICAL 4 OUTPUT

ESTIMATES DERIVED FROM THE MODEL

ESTIMATED MEANS FOR THE LATENT VARIABLES

	CONTENT	CREDIBIL	USEFULNE	ADOPTION
1	0.000	0.000	0.000	0.000

S.E. FOR ESTIMATED MEANS FOR THE LATENT VARIABLES

	CONTENT	CREDIBIL	USEFULNE	ADOPTION
1	0.000	0.000	0.000	0.000

EST./S.E. FOR ESTIMATED MEANS FOR THE LATENT VARIABLES

	CONTENT	CREDIBIL	USEFULNE	ADOPTION
1	0.000	0.000	0.000	0.000

TWO-TAILED P-VALUE FOR ESTIMATED MEANS FOR THE LATENT VARIABLES

	CONTENT	CREDIBIL	USEFULNE	ADOPTION
1	1.000	1.000	1.000	1.000

ESTIMATED COVARIANCE MATRIX FOR THE LATENT VARIABLES

	CONTENT	CREDIBIL	USEFULNE	ADOPTION
CONTENT	1.336			
CREDIBIL	1.087	1.249		
USEFULNE	1.401	1.355	2.377	
ADOPTION	1.061	1.026	1.800	1.717

S.E. FOR ESTIMATED COVARIANCE MATRIX FOR THE LATENT VARIABLES

	CONTENT	CREDIBIL	USEFULNE	ADOPTION
CONTENT	0.108			
CREDIBIL	0.079	0.087		
USEFULNE	0.085	0.078	0.109	
ADOPTION	0.075	0.070	0.096	0.104

EST./S.E. FOR ESTIMATED COVARIANCE MATRIX FOR THE LATENT VARIABLES

	CONTENT	CREDIBIL	USEFULNE	ADOPTION

CONTENT	12.352			
CREDIBIL	13.684	14.323		
USEFULNE	16.402	17.371	21.787	
ADOPTION	14.100	14.692	18.799	16.465

TWO-TAILED P-VALUE FOR ESTIMATED COVARIANCE MATRIX FOR THE LATENT VARIABLES

	CONTENT	CREDIBIL	USEFULNE	ADOPTION
CONTENT	0.000			
CREDIBIL	0.000	0.000		
USEFULNE	0.000	0.000	0.000	
ADOPTION	0.000	0.000	0.000	0.000

ESTIMATED CORRELATION MATRIX FOR THE LATENT VARIABLES

	CONTENT	CREDIBIL	USEFULNE	ADOPTION
CONTENT	1.000			
CREDIBIL	0.842	1.000		
USEFULNE	0.786	0.787	1.000	
ADOPTION	0.701	0.701	0.891	1.000

S.E. FOR ESTIMATED CORRELATION MATRIX FOR THE LATENT VARIABLES

	CONTENT	CREDIBIL	USEFULNE	ADOPTION
CONTENT	0.000			
CREDIBIL	0.014	0.000		
USEFULNE	0.016	0.018	0.000	
ADOPTION	0.019	0.021	0.010	0.000

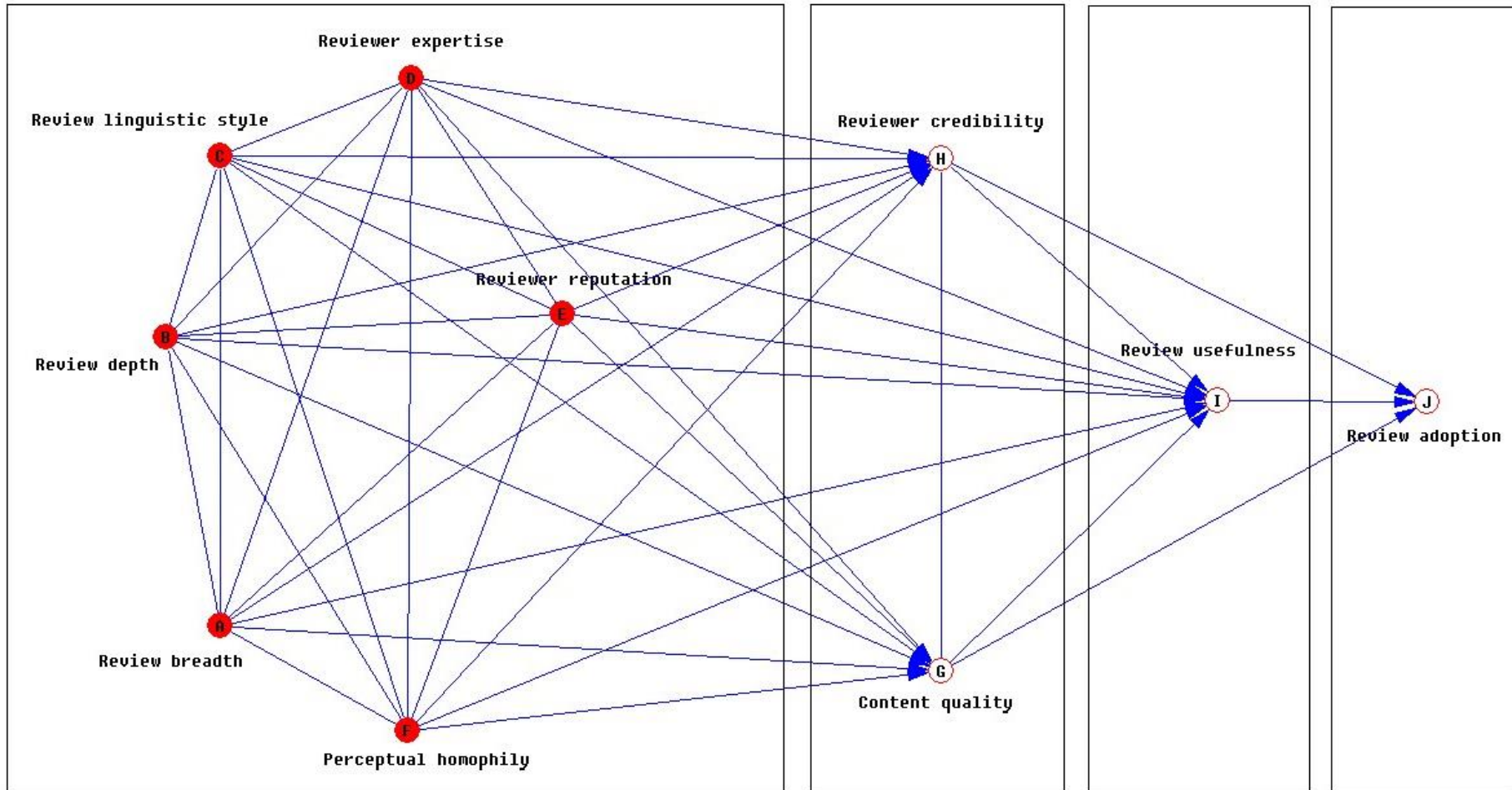
EST./S.E. FOR ESTIMATED CORRELATION MATRIX FOR THE LATENT VARIABLES

	CONTENT	CREDIBIL	USEFULNE	ADOPTION
CONTENT	999.000			
CREDIBIL	59.448	999.000		
USEFULNE	49.809	44.765	999.000	
ADOPTION	35.972	33.999	89.337	999.000

TWO-TAILED P-VALUE FOR ESTIMATED CORRELATION MATRIX FOR THE LATENT VARIABLES

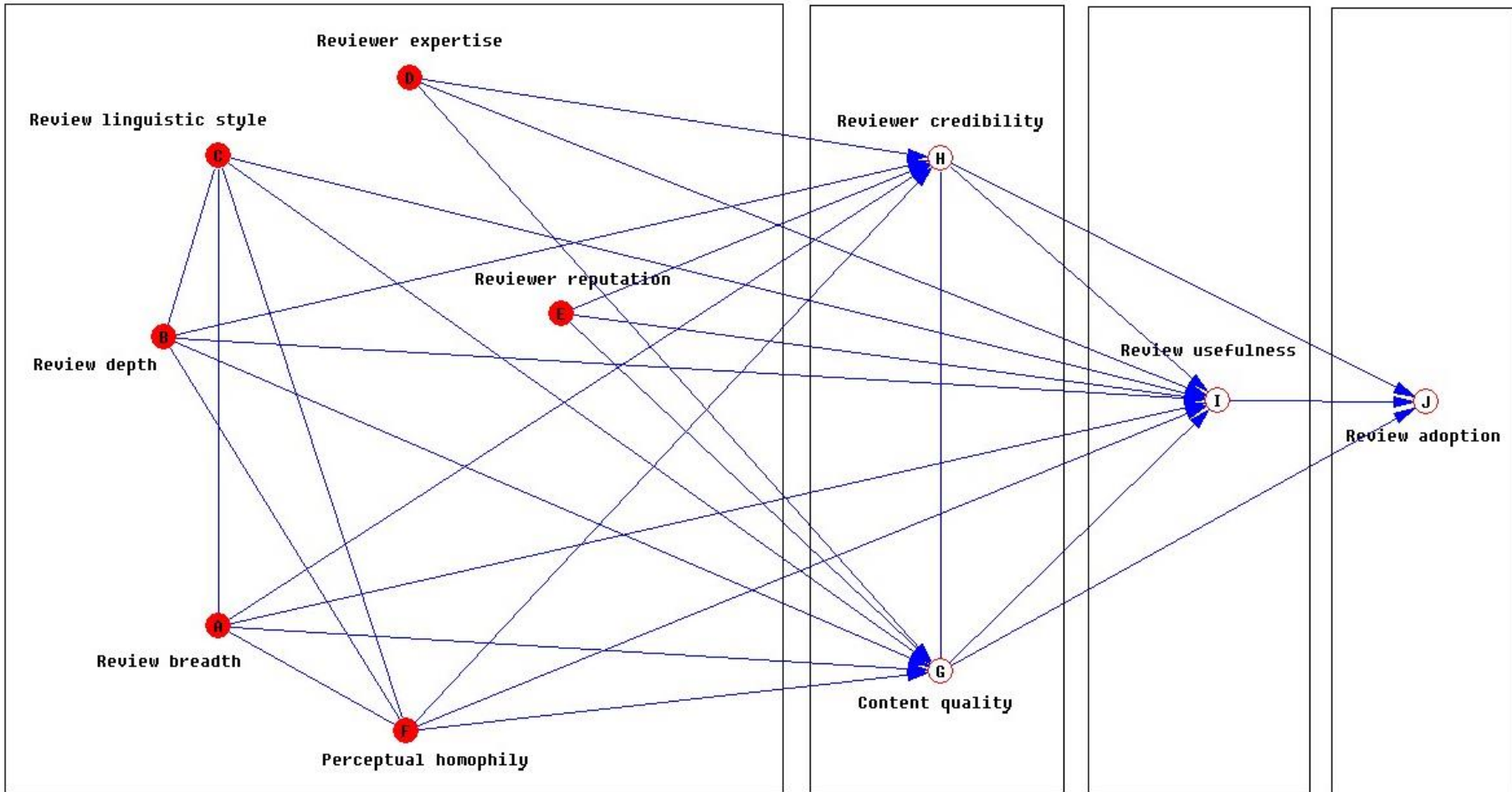
	CONTENT	CREDIBIL	USEFULNE	ADOPTION
CONTENT	0.000			
CREDIBIL	0.000	0.000		
USEFULNE	0.000	0.000	0.000	
ADOPTION	0.000	0.000	0.000	0.000

### Appendix VI. Start model of graphical modelling using MIM





### Appendix VII. Final model of graphical modelling using MIM



## Appendix VIII. Script and output of graphical modeling using MIM

```
MIM->factor A2 B2 C2 D2 E2 F2
MIM->label A "Review breadth" B "Review depth" C "Review linguistic style"
MIM->label D "Reviewer expertise" E "Reviewer reputation" F "Perceptual homophily"
```

```
MIM->cont G H I J
MIM->label G "Content quality" H "Reviewer credibility"
MIM->label I "Review usefulness" J "Review adoption"
```

```
MIM->read ABCDEFGHIJ
[Here include the list of command about reading those 1,140 responses]
Reading completed.
```

```
MIM->setblocks ABCDEF|GH|I|J
Block structure set.
```

```
MIM->satmod
MIM->TestDelete BG
Test of H0: ABCDEF/ABCDEFH,ACDEFG/ACDEFGH,ABCDEFH
against H: ABCDEF/ABCDEFG,ABCDEFH/ABCDEFGH
LR: 164.7887 DF: 96 P: 0.0000
MIM->Delete AJ
MIM->Delete BJ
MIM->Delete CJ
MIM->Delete DJ
MIM->Delete EJ
MIM->Delete FJ
```

```
MIM->TestDelete DG
Test of H0: ABCDEF/ABCDEFH,ABCEFG/ABCEFGH,ABCDEFH
against H: ABCDEF/ABCDEFG,ABCDEFH/ABCDEFGH
LR: 147.8091 DF: 96 P: 0.0005
```

```
MIM->fit
Block -2*CLL
 1  9329.964
 2  5409.357
 3  1931.236
 4  2642.213
-2*LL: 19312.770
```

```
MIM->show P
The current block-recursive model is:
 1 ABCDEF
 2 ABCDEF/ABCDEFG,ABCDEFH/ABCDEFGH
 3 ABCDEF/ABCDEFG,ABCDEFH,ABCDEFI/ABCDEFGHI
 4 ABCDEF/J,ABCDEFI,ABCDEFH,ABCDEFG/GHIJ,ABCDEFGHI
It is heterogeneous graphical.
It is decomposable.
```

MIM->stepwise s  
 Coherent Backward Selection.  
 Fixed edges: none.  
 Critical value: 0.0500  
 Block no. 1  
 Decomposable mode, F-tests where appropriate.  
 DFs adjusted for sparsity.  
 Model: ABCDEF  
 Deviance: 0.0000 DF: 0 P: 1.0000

Edge	Test	Statistic	DF	P
[AB]	10.4398	16	0.8427	
[AC]	15.9742	16	0.4548	
[AD]	10.5899	16	0.8341	
[AE]	5.3803	16	0.9935	
[AF]	21.7501	16	0.1514	
[BC]	13.3447	16	0.6474	
[BD]	9.9386	16	0.8698	
[BE]	4.8498	16	0.9965	
[BF]	65.5843	16	0.0000	+
[CD]	9.8316	16	0.8753	
[CE]	3.0607	16	0.9998	
[CF]	46.4165	16	0.0001	+
[DE]	3.5271	16	0.9995	
[DF]	14.7127	16	0.5458	
[EF]	5.5008	16	0.9926	

Removed edge [CE]  
 Model: ABDEF,ABCDF  
 Deviance: 3.0607 DF: 16 P: 0.9998

Edge	Test	Statistic	DF	P
[AC]	14.1331	8	0.0784	
[AE]	3.5393	8	0.8961	
[BC]	12.3679	8	0.1355	
[BE]	3.8730	8	0.8684	
[CD]	8.1485	8	0.4191	
[DE]	1.8439	8	0.9854	
[EF]	3.6127	8	0.8903	

Removed edge [DE]  
 Model: ABEF,ABCDF  
 Deviance: 4.9046 DF: 24 P: 1.0000

Edge	Test	Statistic	DF	P
[AC]	14.1331	8	0.0784	
[AD]	8.8053	8	0.3590	
[AE]	2.4094	4	0.6609	
[BC]	12.3679	8	0.1355	
[BD]	8.3027	8	0.4045	
[BE]	2.5174	4	0.6415	

[CD]	8.1485	8	0.4191
[DF]	12.1082	8	0.1464
[EF]	2.2067	4	0.6978

Removed edge [EF]

Model: ABE,ABCDF

Deviance: 7.1113 DF: 28 P: 1.0000

Edge	Test	Statistic	DF	P
Excluded				
[AC]	14.1331	8	0.0784	
[AD]	8.8053	8	0.3590	
[AE]	0.4984	2	0.7794	
[AF]	17.8707	8	0.0222	+
[BC]	12.3679	8	0.1355	
[BD]	8.3027	8	0.4045	
[BE]	0.5247	2	0.7692	
[CD]	8.1485	8	0.4191	
[DF]	12.1082	8	0.1464	

Removed edge [AE]

Model: BE,ABCDF

Deviance: 7.6097 DF: 30 P: 1.0000

Edge	Test	Statistic	DF	P
Excluded				
[AB]	6.4264	8	0.5996	
[AC]	14.1331	8	0.0784	
[AD]	8.8053	8	0.3590	
[BC]	12.3679	8	0.1355	
[BD]	8.3027	8	0.4045	
[BE]	0.0303	1	0.8619	
[CD]	8.1485	8	0.4191	
[DF]	12.1082	8	0.1464	

Removed edge [BE]

Model: E,ABCDF

Deviance: 7.6400 DF: 31 P: 1.0000

Edge	Test	Statistic	DF	P
Excluded				
[AB]	6.4264	8	0.5996	
[AC]	14.1331	8	0.0784	
[AD]	8.8053	8	0.3590	
[BC]	12.3679	8	0.1355	
[BD]	8.3027	8	0.4045	
[CD]	8.1485	8	0.4191	
[DF]	12.1082	8	0.1464	

Removed edge [AB]

Model: E,BCDF,ACDF

Deviance: 14.0664 DF: 39 P: 0.9999

Edge	Test	Statistic	DF	P
Excluded				
[AC]	11.4554	4	0.0219	+

[AD]	4.1593	4	0.3849
[BC]	9.6901	4	0.0460 +
[BD]	3.6568	4	0.4544

Removed edge [BD]

Model: E,BCF,ACDF

Deviance: 17.7232 DF: 43 P: 0.9998

Edge	Test	Statistic	DF	P
Excluded				
[AD]		4.1593	4	0.3849
[CD]		3.6191	4	0.4600
[DF]		4.5196	4	0.3402

Removed edge [CD]

Model: E,BCF,ADF,ACF

Deviance: 21.3423 DF: 47 P: 0.9995

Edge	Test	Statistic	DF	P
Excluded				
[AD]		0.6379	2	0.7269
[DF]		1.1318	2	0.5679

Removed edge [AD]

Model: E,DF,BCF,ACF

Deviance: 21.9801 DF: 49 P: 0.9997

Edge	Test	Statistic	DF	P
Excluded				
[DF]		0.6191	1	0.4314

Removed edge [DF]

Block no. 2

Decomposable mode, F-tests where appropriate.

DFs adjusted for sparsity.

Model: ABCDEF/ABCDEFH/ABCDEFH/ABCDEFH

Deviance: 0.0000 DF: 0 P: 1.0000

Edge	Test	Statistic	DF	P
Excluded				
[AG]		128.6747	96	0.0146 +
[AH]		133.8431	96	0.0065 +
[BG]		164.7887	96	0.0000 +
[BH]		129.4423	96	0.0130 +
[CG]		110.7541	96	0.1441
[CH]		110.7433	96	0.1442
[DG]		147.8091	96	0.0005 +
[DH]		135.0548	96	0.0053 +
[EG]		132.7471	96	0.0078 +
[EH]		152.2896	96	0.0002 +
[FG]		257.9612	96	0.0000 +
[FH]		195.8759	96	0.0000 +
[GH]		758.7166	64	0.0000 +

Removed edge [CH]

Model: ABCDEF/ABDEFH,ABCDEFH/ABDEFH,ABCDEFH



H 0.808 1.006  
I 1.268 1.030 1.749  
Means 4.315 3.958 4.131 18.299  
G H I Count  
1 1 1 1 1 2 G 0.693  
H 0.444 0.778  
I 0.474 0.349 0.390  
Means 5.661 5.391 5.756 18.722  
G H I Count  
1 1 1 1 2 1 G 1.043  
H 0.713 0.967  
I 0.825 0.602 1.308  
Means 4.292 3.917 4.238 19.086  
G H I Count  
1 1 1 1 2 2 G 1.851  
H 1.522 1.663  
I 1.810 1.552 2.123  
Means 5.726 5.303 5.705 19.527  
G H I Count  
1 1 1 2 1 1 G 2.193  
H 0.798 0.905  
I 1.994 1.038 2.351  
Means 3.828 3.576 3.479 17.981  
G H I Count  
1 1 1 2 1 2 G 0.420  
H 0.225 0.675  
I 0.171 0.402 0.508  
Means 6.224 5.560 5.884 18.396  
G H I Count  
1 1 1 2 2 1 G 2.536  
H 1.567 1.669  
I 2.380 1.673 2.753  
Means 3.971 3.936 3.834 18.754  
G H I Count  
1 1 1 2 2 2 G 0.859  
H 0.673 1.096  
I 0.584 0.595 0.639  
Means 5.900 5.618 5.833 19.188  
G H I Count  
1 1 2 1 1 1 G 0.843  
H 0.567 0.844  
I 0.253 0.392 0.839  
Means 4.200 3.881 4.310 17.122  
G H I Count  
1 1 2 1 1 2 G 1.103  
H 0.707 0.947  
I 0.955 0.838 1.194  
Means 6.036 5.632 5.956 17.218  
G H I Count  
1 1 2 1 2 1 G 1.714  
H 1.172 1.280  
I 1.865 1.577 2.688

Means 4.583 4.116 4.254 17.859  
 G H I Count  
 1 1 2 1 2 2 G 0.811  
 H 0.667 0.961  
 I 0.578 0.529 0.591  
 Means 6.077 5.592 6.085 17.958  
 G H I Count  
 1 1 2 2 1 1 G 2.071  
 H 0.754 0.889  
 I 0.681 0.817 1.951  
 Means 4.042 3.654 3.539 16.824  
 G H I Count  
 1 1 2 2 1 2 G 1.466  
 H 0.786 0.976  
 I 1.173 0.755 1.171  
 Means 6.019 5.451 5.904 16.918  
 G H I Count  
 1 1 2 2 2 1 G 1.896  
 H 1.172 1.425  
 I 1.380 1.170 1.631  
 Means 3.900 3.892 3.414 17.548  
 G H I Count  
 1 1 2 2 2 2 G 0.448  
 H 0.352 0.844  
 I 0.405 0.444 0.618  
 Means 6.400 6.010 6.287 17.646  
 G H I Count  
 1 2 1 1 1 1 G 2.724  
 H 0.905 0.702  
 I 2.621 0.859 3.063  
 Means 4.861 4.064 4.342 8.118  
 G H I Count  
 1 2 1 1 1 2 G 0.202  
 H 0.193 0.926  
 I 0.188 0.359 0.340  
 Means 6.740 5.882 6.505 26.211  
 G H I Count  
 1 2 1 1 2 1 G 3.605  
 H 2.654 2.378  
 I -0.351 -0.478 0.687  
 Means 4.938 4.529 5.601 8.467  
 G H I Count  
 1 2 1 1 2 2 G 0.370  
 H 0.155 0.313  
 I 0.215 0.154 0.299  
 Means 6.519 5.997 6.466 27.338  
 G H I Count  
 1 2 1 2 1 1 G 0.605  
 H 0.645 1.138  
 I 0.931 1.637 2.895  
 Means 5.643 4.847 5.095 7.976  
 G H I Count



1 2 1 2 1 2 G 0.364  
H 0.168 0.408  
I 0.218 0.252 0.646  
Means 6.405 5.831 6.348 25.755  
G H I Count

1 2 1 2 2 1 G 2.056  
H 1.009 1.207  
I 1.502 1.041 1.428  
Means 5.000 4.323 5.053 8.319  
G H I Count

1 2 1 2 2 2 G 0.460  
H 0.355 0.781  
I 0.328 0.444 0.480  
Means 6.352 5.762 6.312 26.863  
G H I Count

1 2 2 1 1 1 G 1.972  
H 0.655 0.619  
I 0.989 0.863 2.117  
Means 4.333 3.889 3.380 12.504  
G H I Count

1 2 2 1 1 2 G 0.494  
H 0.472 1.191  
I 0.474 0.667 1.019  
Means 6.479 5.633 6.039 23.271  
G H I Count

1 2 2 1 2 1 G 1.137  
H 0.837 1.041  
I 0.659 0.787 1.538  
Means 4.688 4.345 4.512 13.042  
G H I Count

1 2 2 1 2 2 G 0.765  
H 0.321 0.382  
I 0.248 0.148 0.349  
Means 6.403 5.949 6.380 24.272  
G H I Count

1 2 2 2 1 1 G 1.015  
H 1.083 1.605  
I 1.022 0.990 2.311  
Means 4.854 4.006 4.378 12.286  
G H I Count

1 2 2 2 1 2 G 0.905  
H 0.417 0.523  
I 0.944 0.464 1.282  
Means 6.083 5.683 6.186 22.866  
G H I Count

1 2 2 2 2 1 G 0.979  
H 0.481 0.948  
I 0.109 -0.266 0.435  
Means 5.250 4.445 4.710 12.815  
G H I Count

1 2 2 2 2 2 G 0.235  
H 0.182 0.647

	I	0.230	0.426	0.539	
	Means	6.685	6.019	6.429	23.850
	G	H	I	Count	
2 1 1 1 1 1	G	1.444			
	H	0.471	0.821		
	I	1.125	0.877	2.428	
	Means	4.375	4.201	4.159	14.537
	G	H	I	Count	
2 1 1 1 1 2	G	1.107			
	H	0.821	0.990		
	I	0.494	0.410	0.496	
	Means	5.961	5.492	5.977	20.779
	G	H	I	Count	
2 1 1 1 2 1	G	1.257			
	H	1.007	1.270		
	I	1.207	1.190	1.880	
	Means	5.250	4.600	4.930	15.162
	G	H	I	Count	
2 1 1 1 2 2	G	0.931			
	H	0.593	0.865		
	I	0.472	0.671	0.776	
	Means	5.943	5.572	5.969	21.673
	G	H	I	Count	
2 1 1 2 1 1	G	1.428			
	H	0.842	0.903		
	I	1.062	0.821	1.240	
	Means	4.481	3.939	4.323	14.284
	G	H	I	Count	
2 1 1 2 1 2	G	0.875			
	H	0.547	0.814		
	I	0.619	0.595	0.611	
	Means	6.022	5.673	6.068	20.418
	G	H	I	Count	
2 1 1 2 2 1	G	0.592			
	H	0.380	0.599		
	I	0.229	0.013	0.517	
	Means	4.846	4.415	4.724	14.898
	G	H	I	Count	
2 1 1 2 2 2	G	0.952			
	H	0.578	0.799		
	I	0.467	0.419	0.596	
	Means	6.159	5.764	6.004	21.296
	G	H	I	Count	
2 1 2 1 1 1	G	1.120			
	H	0.365	0.787		
	I	0.680	0.744	1.809	
	Means	4.750	4.323	4.442	20.404
	G	H	I	Count	
2 1 2 1 1 2	G	0.630			
	H	0.467	0.727		
	I	0.412	0.437	0.466	
	Means	6.271	5.722	6.110	14.383

	G	H	I	Count
2 1 2 1 2 1	G 1.923			
	H 1.541	1.698		
	I 1.638	1.680	2.298	
	Means 4.141	3.711	3.735	21.282
	G	H	I	Count
2 1 2 1 2 2	G 0.563			
	H 0.358	0.716		
	I 0.493	0.492	0.682	
	Means 6.325	5.816	6.366	15.002
	G	H	I	Count
2 1 2 2 1 1	G 1.927			
	H 1.136	1.076		
	I 1.803	1.024	2.160	
	Means 4.587	4.002	4.099	20.049
	G	H	I	Count
2 1 2 2 1 2	G 1.248			
	H 0.780	0.960		
	I 0.886	0.814	1.098	
	Means 5.672	5.454	5.914	14.133
	G	H	I	Count
2 1 2 2 2 1	G 1.016			
	H 0.653	0.774		
	I 1.044	0.708	1.950	
	Means 4.792	4.380	4.210	20.912
	G	H	I	Count
2 1 2 2 2 2	G 0.899			
	H 0.546	0.780		
	I 0.653	0.586	0.697	
	Means 5.967	5.647	6.014	14.741
	G	H	I	Count
2 2 1 1 1 1	G 0.813			
	H 0.502	0.742		
	I 0.231	0.943	1.582	
	Means 5.000	4.591	4.162	6.449
	G	H	I	Count
2 2 1 1 1 2	G 0.453			
	H 0.282	0.778		
	I 0.240	0.330	0.359	
	Means 6.357	5.661	6.370	29.091
	G	H	I	Count
2 2 1 1 2 1	G 3.824			
	H 3.053	2.887		
	I 2.949	2.388	2.482	
	Means 4.438	4.192	3.598	6.726
	G	H	I	Count
2 2 1 1 2 2	G 0.547			
	H 0.549	0.996		
	I 0.456	0.604	0.673	
	Means 6.455	5.695	6.361	30.342
	G	H	I	Count
2 2 1 2 1 1	G 0.812			

H 0.433 0.924  
 I 1.058 0.502 1.463  
 Means 5.844 5.156 5.792 6.336  
 G H I Count  
 2 2 1 2 1 2 G 0.789  
 H 0.450 0.876  
 I 0.253 0.292 0.367  
 Means 6.472 5.801 6.417 28.585  
 G H I Count  
 2 2 1 2 2 1 G 1.156  
 H 0.877 1.215  
 I 1.095 0.907 1.344  
 Means 5.625 5.225 5.536 6.609  
 G H I Count  
 2 2 1 2 2 2 G 1.436  
 H 0.939 1.016  
 I 0.420 0.413 0.458  
 Means 6.286 5.946 6.345 29.815  
 G H I Count  
 2 2 2 1 1 1 G 2.774  
 H 1.715 1.492  
 I 1.847 1.282 1.928  
 Means 4.706 4.409 3.988 14.900  
 G H I Count  
 2 2 2 1 1 2 G 0.867  
 H 0.539 0.938  
 I 0.436 0.359 0.603  
 Means 6.278 5.611 6.082 19.440  
 G H I Count  
 2 2 2 1 2 1 G 0.968  
 H 0.773 1.067  
 I 0.911 0.864 1.964  
 Means 4.732 4.427 4.436 15.541  
 G H I Count  
 2 2 2 1 2 2 G 0.434  
 H 0.436 0.881  
 I 0.213 0.446 0.684  
 Means 6.440 5.681 6.182 20.276  
 G H I Count  
 2 2 2 2 1 1 G 1.857  
 H 0.991 1.221  
 I 1.531 0.880 1.450  
 Means 5.442 4.942 5.231 14.641  
 G H I Count  
 2 2 2 2 1 2 G 0.734  
 H 0.419 0.859  
 I 0.558 0.704 1.031  
 Means 6.263 5.681 6.032 19.102  
 G H I Count  
 2 2 2 2 2 1 G 1.766  
 H 1.339 1.565  
 I 1.341 0.930 1.443

Means	4.883	4.663	4.372	15.271
	G	H	I	Count
2 2 2 2 2 2	G	0.572		
	H	0.374	0.647	
	I	0.344	0.275	0.363
Means	6.490	6.080	6.507	19.923
	G	H	I	Count