

UNDERSTANDING THE ELECTRONIC WORD-OF-MOUTH COMMUNICATION  
PROCESS: COMMUNICATION EFFECTIVENESS AND ANALYTIC TOOLS

by

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SIGNED: Chuanyi Tang

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## DEDICATION

To my wife, Lin Guo, who have supported me with her patience, love, understanding,  
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To my son, Victor Weihe Tang, whose coming to the world was my greatest inspiration  
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## **ABSTRACT**

Electronic word-of-mouth (eWOM) has increasingly become an important topic in marketing and consumer research. However, theory construction and methodology development in this area are still in their infancy. This leaves some basic and important questions unanswered including whether eWOM communication is effective, what roles are played by different communication cues, and how valuable information from text reviews can be generated. This study intends to answer these fundamental questions.

Based on the Brunswik's Len Model, this study developed the Process Model of eWOM Communication. It extends the Brunswik's Lens Model in several important ways and provides a systematic tool to examine the effectiveness of eWOM communication processes. Furthermore, a simplified model of eWOM communication was developed to test the validity of automatic text analysis as a promising tool in studying eWOM communication.

Two focus group interviews and a throughout literature review were conducted first to identify the communication cues employed by eWOM partners. Then, two web-based self-administered surveys were carried out to collect data from both eWOM senders and readers. Last, the data from both eWOM senders and readers were matched, forming a final dataset with 90 reviews. Correlations, regressions, and path analyses were employed to evaluate the models and test the hypotheses.

Results showed that eWOM communication is effective, and the relative strength of information flow varies in different eWOM communication links when communicating different types of information.

This study identified a list of eWOM communication cues and found that consumers employ different cues in communicating different types of information. EWOM readers' inference structure in decoding may not exactly mirror eWOM senders' encoding structure. Moreover, communication cues especially verbal cues play an important role in eWOM communication and explain additional variance in eWOM partners' intentions and perceptions beyond and above the star ratings. In general, negative emotion words are the most important cues across various situations.

In addition, this study provides initial evidence for the validity of automatic text analysis in studying eWOM. Linguistic indicators such as Negations, Negative Emotions, and Money can explain additional variance in eWOM partners' attitudes and emotions beyond and above the star ratings.

## **CHAPTER 1**

### **INTRODUCTION**

The impact of consumer word-of-mouth on consumer behavior and firm performance has been traditionally documented in consumer or marketing research (e.g., Bone, 1995; Bowman and Narayandas, 2001; Gruen, Osmonbekov, and Czaplewski, 2006). The advent of the Internet dramatically expanded the scale and scope of word-of-mouth (WOM) communication (Chen and Xie, 2008). In the past, WOM communications had geographic constraints and were conducted mainly among local networks (Brown and Reingen, 1987). Now, however, consumers can easily and freely reach hundreds and thousands of other consumers' reviews through the Internet and can exchange with each other their opinions, experiences, evaluations, and knowledge about companies, products and services (Ratchford, Talukdar, and Lee, 2001; Dellarocas, Farag, and Zhang, 2004a). As a result, the diffusion of WOM among consumers has become faster and more efficient than ever, and the market power of WOM is reaching an unprecedented scale (Datta, Chowdhury, and Chakraborty, 2005; Dellarocas, Farag, and Zhang, 2004b).

For the significant market impact of electronic word-of-mouth (eWOM), researchers have begun to explore the relationships between eWOM and consumers' decision making and market outcomes in recent years (e.g., Chen and Xie, 2008; Godes and Mayzlin, 2004). However, because this topic represents a relatively new research area, theory construction and methodology development are still in their infancy, resulting in several basic and important unanswered research questions. One of these

fundamental questions concerns the effectiveness of eWOM communication in terms of how much attitudinal and affective information from eWOM senders can be accurately perceived by eWOM receivers and furthermore shape eWOM receivers attitudes and emotional states, and finally their future purchasing intentions toward a product or service.

The majority of the eWOM literature focuses on the outcomes of eWOM (e.g., Dellarocas, Farag, and Zhang, 2004a; Chakravarty, Liu, and Mazumdar, 2008; Chevalier and Mayzlin, 2006). However, little is known about the communication process and communication effectiveness of eWOM. Consistent with the definition of advertising effectiveness (e.g., Stewart and Koslow, 1989; Aitken, Gray, and Lawson, 2008), eWOM effectiveness is defined as to what extent eWOM readers can perceive the information communicated by eWOM senders, and how much the communicated information can influence the eWOM readers' attitudes, emotional states, and future patronage intentions toward a product/service. Regarding the question of eWOM effectiveness, two major streams of research on computer-mediated-communication have provided two different answers. On the one hand, the cues-filtered-out approach (Culnan and Markus, 1987) argues that because of the absence of nonverbal cues such as facial expression and body movement, and social cues such as gender and social status, computer networks lack the capability of information communication, especially emotional information communication. Furthermore, some consumer research (Herr, Kardes, and Kim, 1991; McGill and Anand, 1989) indicated that compared with face-to-face (FTF) WOM, the less vivid printed communication exerted a weaker impact on consumers' product

judgment. On the other hand, the social information process model (Walther, 1992) suggests that individuals can adapt to Internet channels and use linguistic cues to communicate their emotions as effectively as in face-to-face communication. Up to now, there has been no conclusion regarding which side of the story is correct.

The answer to the communication effectiveness question of eWOM is very important to eWOM research because many researchers treat the eWOM communication process as a black box and assume that eWOM readers can precisely detect the information delivered by eWOM senders. Furthermore, they argue the perceived information shapes eWOM receivers' attitudes and patronage intentions toward a product/service. If the answer to the eWOM communication effectiveness question is negative, the assumptions regarding the influence of eWOM on consumer behavior would be questionable. Above all, whether or to what extent eWOM senders' attitudinal and affective information toward a product or service can be communicated through eWOM efficiently, and how much impact the text-based eWOM communication can exert on eWOM receivers' attitudes and future purchase intentions toward the product/service, is a fundamental question for eWOM researchers.

In order to fill this gap in the literature, this study proposed a Process Model for eWOM Communication (PMEC) based on modified Brunswik's Lens Models (Brunswik, 1956; Gifford, 1994; Hammond and Stewart, 2001; Scherer, 2003). Within this process model, the entire range of eWOM communication activities, i.e., encoding, transmission, and decoding, are considered. Furthermore, the effectiveness of eWOM communication is examined by calculating the association between communication intentions of eWOM

senders and the cues recorded by the senders, the receipt of these cues by the communication receivers, and whether the receivers perceive the cues as the senders intended. Effectiveness is also measured by the degree to which eWOM receivers' attitudes, cognitions, and patronage intentions toward a product/service are altered as a result of eWOM communication.

In addition, this study will shed new light on the understanding of the eWOM process by identifying the cues (especially linguistic cues) communicated in consumers' eWOM process and investigating the roles these cues play in eWOM communication. This study represents one of the first to employ a comprehensive Lens Model analysis to quantify eWOM process. Since verbal cues have traditionally been neglected in interpersonal communication (Gifford and Hine, 1994), this paper will not only provide new insights into the understanding of consumers' eWOM process, but also contribute to the literature of computer-based interpersonal communication with new knowledge about the role of verbal cues in interpersonal communication.

The second gap in eWOM research is that most previous studies have focused on the volume or the star ratings of online reviews and neglected any information contained in the actual text reviews (Lehto, Park, Park, and Lehto, 2007). However, because of the text-based communication nature of eWOM, text reviews contain rich consumer information that is vital in understanding the eWOM communication process and its outcomes, and some of the information may not be captured by overall star ratings or the volume of online reviews. As a result, although consumers have posted a huge amount of online reviews on the Internet containing their insights, thoughts, attitudes, and

preferences regarding a multitude of products and services, the potential value of the information contained in the textual reviews as a gold mine has rarely been explored (Lehto, Park, Park, and Lehto, 2007). Thus, a text analysis method that can deal with a large amount of textual data reliably and efficiently is needed to explore the valuable information contained in the text reviews.

Although Automatic Text Analysis (ATA) has been suggested as a promising tool in psychology with the capability to analyze a vast amount of textual data effectively and efficiently, the validity of the ATA method in eWOM research has never been examined. Specifically, the research questions that need to be answered include: (1) to what extent do linguistic indicators generated by ATA correlate with both the cues sent by eWOM senders (i.e., distal cues) and those received by the eWOM receivers (i.e., proximal cues)? (2) What are the relationships between linguistic indicators and traditional self-report measures? (3) What is the predictive utility of linguistic indicators on consumers' attitudes and emotional states toward a product/service?

In order to answer these questions, this study proposed a simplified eWOM communication model with an emphasis on predictive utility of the ATA method. Based on the simplified model, this study first investigates the correlations between linguistic indicators generated by ATA and the cues identified by the eWOM communication partners. This result shows how much the real-world information utilized by communication partners in eWOM communication can be captured by linguistic indicators identified by the ATA method. The ATA method is valid for eWOM research only when its indicators can share a significant amount of variance with the cues utilized

by the actual consumers. Furthermore, the predictive validity of linguistic indicators on eWOM partners' attitudes and emotional states is emphasized because some previous studies (e.g., Pennebaker, Francis, and Booth, 2001) have examined the convergent, content, and concurrent validities of the ATA method. Considering the dramatically increasing number of studies addressing the relationships between eWOM and consumer purchasing behaviors and firm market performance, the predictive utility of ATA indicators is important for eWOM research because it may provide a new linguistic approach to studying eWOM. At last, this study examines the correlations between linguistic indicators and consumers' self-report explicit measures, and compares the predictive utility of linguistic indicators on eWOM partners' attitudes and emotions with that of the star ratings. It is meaningful to introduce ATA and corresponding linguistic indicators into eWOM research only if linguistic indicators can explain additional variance of consumers' attitudes and emotional states beyond and above the star ratings.

Above all, this study has three objectives as follows: (1) to test the Process Model of EWOM Communication and examine the effectiveness of eWOM communication processes within this model, (2) to identify the cues employed by consumers and the role played by these cues in consumers' eWOM communication, (3) to examine the simplified mode of eWOM communication and validate the computer-based quantitative content analysis method in studying eWOM. This study represents a pioneering effort in eWOM research as reflected in these objectives. This study will contribute to eWOM research both theoretically and methodologically. To achieve the purposes of this study, a new theoretical framework will be developed and introduced in the next chapter.

## **CHAPTER 2**

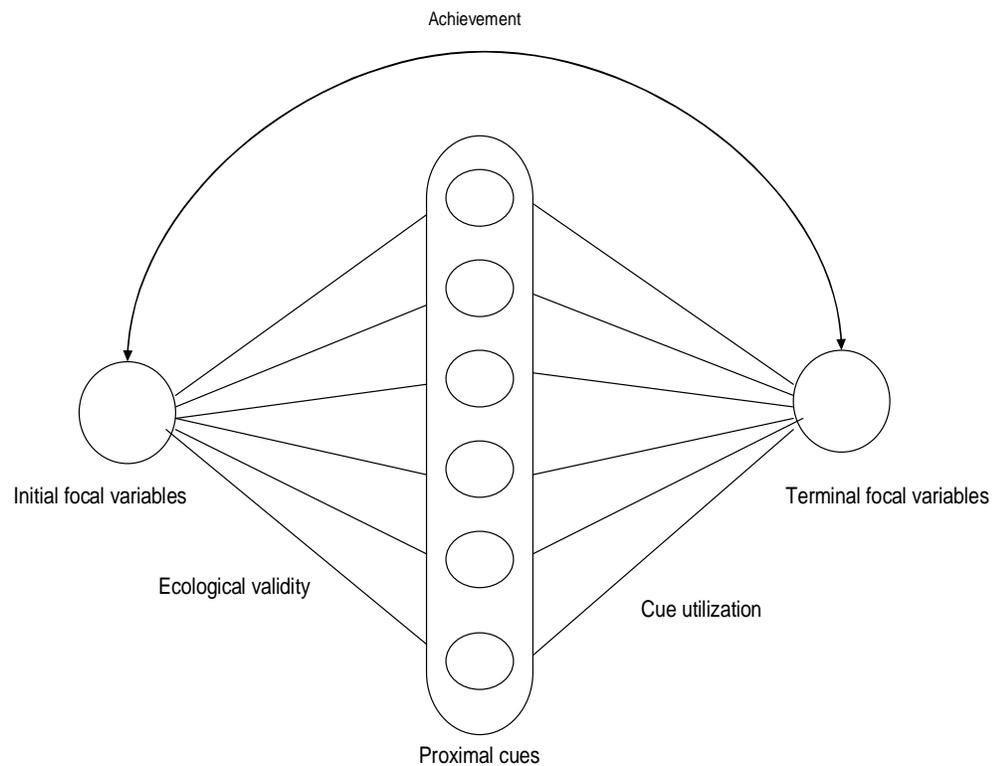
### **THEORETICAL FRAMEWORK**

To address gaps identified in Chapter 1, a theoretical framework is developed in order to study the eWOM communication processes. The theoretical framework of this study is based on Brunswik's Lens Model and its derivants (Brunswik, 1956; Gifford, 1994; Hammond and Stewart, 2001; Scherer, 2003). A review of related research on Brunswik's Lens Model is provided here first. Then, a Process Model of eWOM Communication (PMEC) developed from Brunswik's Lens Model is introduced as a major theoretical framework of this study. Following the presentation of the Process Model, a simplified model of eWOM communication is presented.

#### **Brunswik's Lens Model**

Brunswik's Lens Model was first developed to investigate organisms' perception of physical environment. The original Lens Model is presented in Figure 2.1. As shown in Figure 2.1, the Lens Model proposes that since targets of perceptions, called distal environmental variables or initial focal variables, are not directly observable, a perceiver needs to rely on some imperfect indicators to develop his/her own perceptions. Initial focal variables are the targets of the perceptions. The imperfect indicators, termed as proximal cues, are the directly observed information that provides the basis for perception and judgment. The developed perceptions, called terminal focal variables, represent individuals' perception and judgment about the initial focal variables. In the model, the correlations between proximal cues and initial focal variables represent what is referred to as the ecological validities of the cues, while the correlations between

proximal cues and the terminal focal variables portray the unitization of the cues by the organism. The correlations between the initial focus variables and terminal focal variables are termed as functional validity or achievement. The Lens Model provides a process tool in which the basic unit of perceiver and target can be studied with its probabilistic contingencies. It is called the Lens Model because the organism's perception process resembles a bundle of rays passing through a convex lens (Brunswik, 1952).



*Figure 2.1* Brunswik's Lens Model

In early stages of research, the Lens Model was mainly used to study individuals' perceptions of their physical environments (e.g., Brunswik, 1956; Epstein et al., 1961; Carlson, 1962). One recent example of this approach was conducted by Gifford et al. (2000). The authors employed the Lens Model to study individuals' perceptions of the beauty of modern buildings. This study identified some physical characteristics of modern buildings and then connected them to the emotional impact of the buildings on observers, and the observers' global appraisal of the building. They found that both architects and laypersons strongly based their global assessments on elicited pleasure, but the two groups based their emotional assessment on an almost entirely different set of objective building features.

Following the early research employing the Lens Model, the Lens Model was used extensively in studying human judgment regarding social perception (Bernieri, Gillis, Davis, and Brahe, 1996; Albright et al., 1997; Burgoon and Le Poire, 1999). In studying social perception, the terminal focus was human judgment about others' traits, the initial focus variable was self-reported personality or interpersonal characteristics, and the proximal cues were common physical qualities or behaviors that are directly observable but only probabilistically related to the target characteristics. In these studies, ecological validities were estimated by the correlations between self-reported personalities and proximal cues. Cue utilization was represented by the relationships between proximal cues and observers' perceptions. Achievement or functional validity was the correlation between the self's and observer's ratings of self's personality. Many studies have been conducted using this approach. For example, Bernieri et al. (1996) employed the Lens

Model to examine dyad rapport and found that nonverbal behavioral cues such as expressivity, synchrony, and posture shifts can predict individuals' self-reported dyad rapport. Furthermore, based on the Lens Model, Argyle, Alkema, and Gilmour (2006) found that nonverbal cues had a greater effect on the rating of the individual trait of hostile-friendly than verbal cues, and Gesn and Ickes (1999) found that empathic accuracy in the clinically relevant context was primarily dependent on verbal rather than nonverbal cues. At last, Hall and Mast (2007) compared the effects of different cue modalities (full video, audio, transcript or silent video) and different instructions (infer thoughts and feelings, infer thoughts, and infer feelings) on empathy accuracy. They found that verbal information contributed most to empathy accuracy, followed by nonverbal cues. Visual nonverbal cues contributed the least, though still at least above zero. Furthermore, individuals infer feelings depending more on visual nonverbal cues, and infer thoughts depending more on verbal cues.

Gifford and colleagues (Gifford, 1994; Gifford and Hine, 1994; Gifford, Ng, and Wilkinson, 1995) also conducted several influential studies in this area. For example, Gifford et al. (1995) found strong correlations between judgments of personality characteristics and several nonverbal behavior cues, such as smiling, gesturing, nodding and eye contact (i.e., cue utilization). In addition, they reported moderate to strong correlations between personality judgments and self-ratings of personal characteristics (ecological validity). Furthermore, Gifford (1994) presented a framework for understanding the encoding and decoding of interpersonal dispositions based on nonverbal behaviors. Gifford and Hine (1994) studied the role of verbal behaviors in the

encoding and decoding of interpersonal dispositions by comparing observers' perceptions of individuals' dispositions through two channels: videotape vs. transcript. Both studies suggested that the lens-mapping approach advocated by the Lens Model is a promising method for specifying the observable behaviors that underlie self-other agreement.

Brunswik's Lens Model was strongly suggested as a suitable theory to guide research on interpersonal communications (Scherer, 2003). Some researchers (e.g., Hake and Weintraub, 1966) argued that Brunswik's perspective is similar to Shannon and Weaver's (1949) communication theory in that the Lens Model describes a communication system that includes a sender (the distal stimulus), a noisy channel (the proximal cues) and a receiver (the perceiver). Thus, the Lens Model is genuinely suitable for studying interpersonal communication because it models the complete communication process, including encoding (expression), transmission, and decoding (impression). Some studies have been conducted to examine interpersonal communication including the communication of emotions through vocal cues (Scherer, 2003), music performance (Juslin, 1997; Juslin, 2000), and emails (Boonthanom, 2004) etc. For example, Juslin (2000) examined cue utilization in communication of emotion in music performance. This study found that music performers were successful at communicating emotions to listeners. Furthermore, performers' cue utilization (e.g., tempo, loudness, and spectrum etc) was well matched to listeners' cue utilization, and different emotions were associated with different patterns of cues. At last, cue utilization was more consistent across different melodies than across different performances. Boonthanom (2004) examined the decoding and cue utilization process of

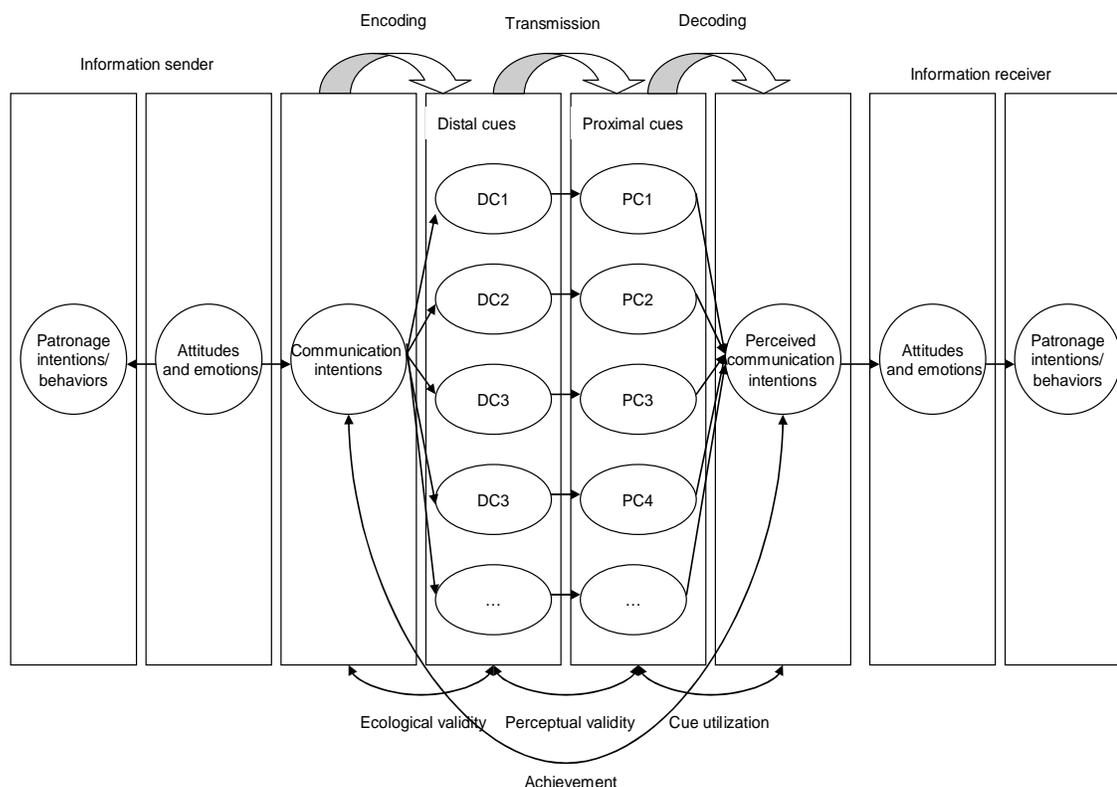
computer-mediated-communication of emotions through emails. In a laboratory experiment, this study manipulated emotional states (positive vs. negative emotions), the strength of message cues (low, medium, and high), and the types of message cues (emotional words, linguistic markers, and paralinguistic cues), and found that message receivers' perception about the emotion of message senders is positively associated with three types of emotional cues in the message: emotion words, linguistic markers, and paralinguistic cues.

### **Process Model of eWOM Communication (PMEC)**

The first purpose of this study is to examine the effectiveness of eWOM communication in terms of to what extent the attitudinal and affective information communicated by eWOM senders can be perceived accurately by eWOM receivers and can influence the eWOM receivers' attitudes, emotional states, and future purchasing intentions toward a product/service. To achieve this goal, a Process Model of eWOM Communication is developed based on Brunswik's Lens Model and its derivants (Brunswik, 1956; Gifford, 1994; Hammond and Stewart, 2001; Scherer, 2003). The Process Model is established to examine the effectiveness of all communication links within consumer-to-consumer online communication process with an emphasis on the potential influence of eWOM communication on consumers' future patronage intentions. This model seeks to provide researchers with a systematic tool to investigate the entire range of eWOM communication activities, from encoding, transmission, decoding, to their outcomes.

The Process Model for EWOM Communication is presented in figure 2.2. This model proposes that the eWOM communication process starts when an eWOM sender develops his/her attitudes and emotional states toward a product/service based on his/her consumption experience. Then the eWOM sender determines how good or how bad the information about the product/service is that he/she plans to deliver to other consumers through eWOM. This process is the formation of communication intentions. After his/her communication intentions are established, the eWOM sender will incorporate his/her attitudes or emotional states into the text of the online review according to his/her communication intentions. This process is called encoding, and the cues or indicators the eWOM sender employed in the online review to convey his/her attitudinal and emotional information are called distal cues. The correlations between distal cues and communication intentions represent ecological validity of the distal cues. Ecological validity indicates to what extent an eWOM sender's intended emotional and attitudinal information can be transferred into distal cues. It measures the effectiveness of the encoding process. After an online review is sent to online consumer forums, eWOM receivers may read the review. First, eWOM receivers need to detect the attitudinal and emotional information delivered in the online reviews by perceiving the cues contained in the text review. The cues perceived by the eWOM receiver as the indicators of attitudinal or emotional information are called proximal cues, and the process of transferring eWOM from distal cues to proximal cues is called transmission or perception. The correlations between distal cues and proximal cues are called perceptual validity. It indicates to what extent the distal cues encoded by an eWOM sender are actually perceived by eWOM

receivers as proximal cues. Based on perceived proximal cues, eWOM receivers infer the attitudes and emotional states that the eWOM sender intends to communicate. This process refers to decoding, and the correlations between an eWOM sender's communication intentions and eWOM receivers' perceived communication intentions is called achievement. Achievement indicates to what extent the attitudinal and emotional information delivered by an eWOM sender can be accurately perceived by eWOM receivers. At last, the perceived evaluative and emotional information helps eWOM receivers develop their own attitudes and emotional states toward the product/service and furthermore establish their patronage intentions and behaviors toward the product or service. In the whole eWOM process, both distal cues and proximal cues are probabilistic in the sense that they are not perfectly reliable indicators of the intended attitudes and emotional expression. The Process Model for eWOM Communication (PMEC) will be discussed in detail in the following paragraphs.



*Figure 2.2* Process Model of eWOM Communication

This model extends the original Brunswik's Lens Model in several ways. First, this model includes not only the process of information communication but also the outcomes of the information communication - the formation of attitudes and intentions. Because the common goal of eWOM communication is to make an impact on the message receivers, incorporating attitudes and future patronage intentions helps better measure the effectiveness of eWOM communication processes. Second, both the original Brunswik's Lens Model and most previous research (e.g., Bernieri et al, 1996; Juslin, 2000; Gifford, 1994) employing the Lens Model ignored the information transmission process and did

not distinguish distal cues from proximal cues. In fact, distal cues utilized by information senders may not perfectly match proximal cues detected by information receivers, which may lead to a gap in the information transmission process. The problem caused by omitting the transmission process is that the perceptual validity of information communication can not be evaluated, and as a result the errors caused by information transmission may not be detected. Here perceptual validity refers to the correlations between distal cues and proximal cues. Third, most previous studies focused on the role of nonverbal cues (e.g., proximity, smiling, eye contact, and body-leaning etc.) in interpersonal communication, while the verbal cues or other linguistic non-verbal cues have seldom been addressed in previous studies (Fussell, 2002). Although nonverbal cues have widely been believed to be an important information carrier in interpersonal communication, linguistic cues may also help to deliver information in interpersonal information communication, especially in text-based online communication (Hancock, Landrigan, and Silver, 2007). This study focuses on the linguistic cues in text-based eWOM communication, and will contribute to the communication literature by extending the understanding of the role played by linguistic cues in interpersonal communication.

### **Simplified Model of eWOM Communication**

Although the Process Model of eWOM Communication (PMEC) proposed in this study is thought to be an effective tool for studying eWOM communication, it is too complex to be operationalized. Especially, measuring distal and proximal cues is time-consuming and subject to human errors. In addition, in empirical research, researchers care more about how much the eWOM communication process can influence

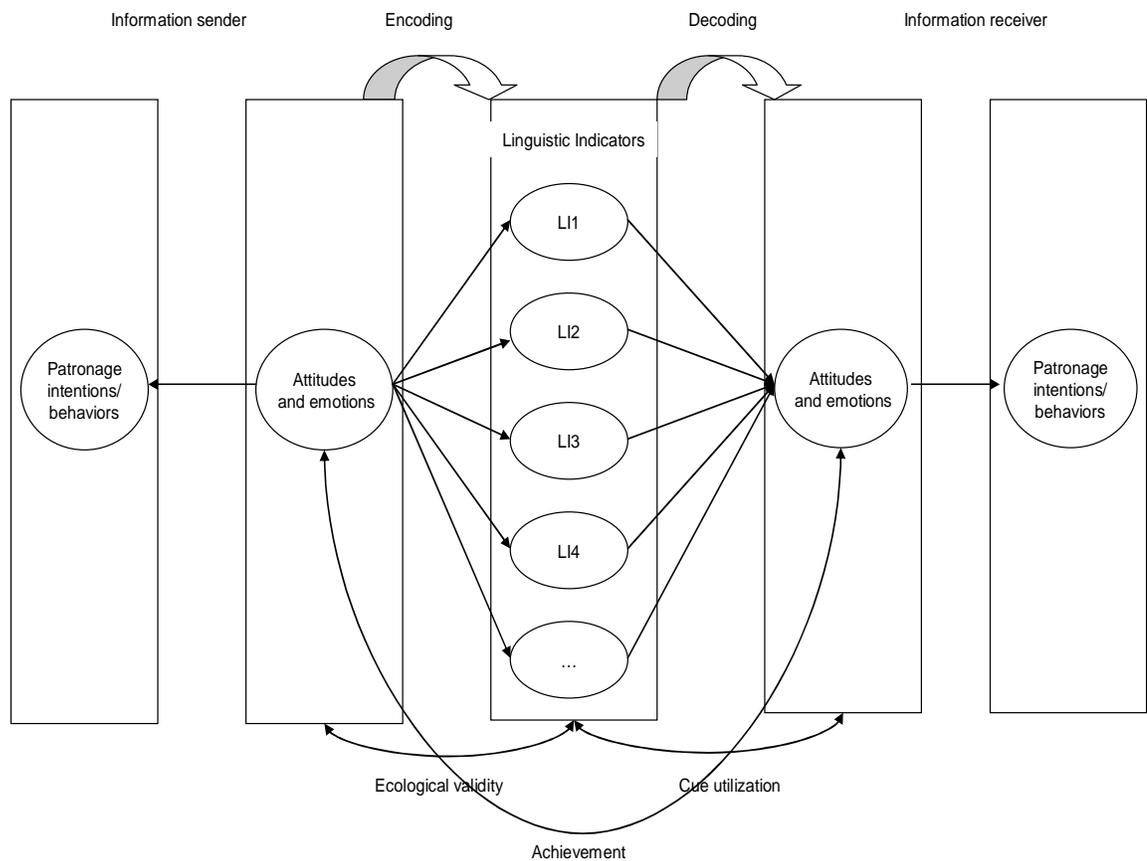
eWOM readers' attitudes and emotional states, and also their patronage intentions, rather than the communication process itself. Thus, in terms of practical purposes, the Process Model of eWOM Communication is too complicated and a simplified version is needed. In the simplified model, communication cues should be automatically measured rather than human-coded. Furthermore, in order to provide managerial implications, the outcomes of eWOM communication but the communication process should be emphasized in the simplified model. In an ideal scenario, researchers and practitioners download online reviews and perform simple computer-based analysis, and then they can use the indicators generated from the analysis to directly predict readers' attitudes, emotional states, and future patronage intentions toward the product/service. ATA, as an effective tool for text analysis, has the potential to serve the purpose of effectively identifying the valuable information hidden in eWOM. The linguistic indicators generated by ATA may be used to predict eWOM readers' attitudes, emotional states, and patronage intentions toward a product/service after reading online reviews. Compared to human coding, one important advantage of ATA is that it can measure the cues objectively and repeatedly (Pennebaker and Francis, 1996; Tian, Yanm and Stewart, 2005).

Based on the above idea, this study proposes a simplified version of the eWOM communication model. In this simplified model, the transmission process is not considered, and instead, linguistic indicators generated by ATA are used to substitute for both distal and proximal cues. Furthermore, to make the model parsimonious, the processes in which eWOM senders develop their communication intentions and eWOM

receivers perceive eWOM senders' communication intentions are not considered. Finally, the predictive utilities of linguistic indicators generated by ATA on eWOM receivers' attitudes and emotional states are emphasized in this simplified model. If the predictive validity of ATA method can be verified, predicting the influence of eWOM on consumers will become very simple: practitioners firstly conduct the ATA analysis on the online reviews about a product/service, and then they can use the linguistic indicators generated by ATA to predict the eWOM receivers' attitudes and emotional states, as well as their future patronage intentions toward the product/service.

In addition, in order to further explore the nature of linguistic indicators generated by ATA, the correlations between linguistic indicators and self-report explicit measures will be tested, and furthermore the predictive utility of linguistic indicators on consumers' attitudes and emotional states will be compared with that of star ratings. This result will provide important information about the validity of applying ATA method in eWOM research.

The simplified eWOM communication model is presented in Figure 2.3. This model starts from eWOM senders' attitudes and emotional states toward a product/service. Then eWOM senders encode their attitudes and emotions into cues that are contained in online reviews. Since eWOM is text-based, communication cues are linguistic cues in nature and can be identified by the ATA method. When eWOM receivers read online reviews, they decode the linguistic cues, and form their own attitudes and emotional states toward the product or service. Finally, the attitudes and emotional states will drive eWOM receivers' future patronage intentions and behaviors toward the product/service.



*Figure 2.3* Simplified Model of eWOM Communication

Overall, the Brunswik's Lens Model depicts the complete communication process and provided a theoretical foundation for our framework. Based on the Lens Model, a Process Model of eWOM Communication (PMEC) and a simplified model of eWOM communication are developed in order to examine the effectiveness of eWOM communication process and validate the ATA method in eWOM research. In the next chapter, the related studies on eWOM and linguistic analysis are reviewed to reflect the current status of research in related fields and lay a foundation for hypothesis development.

## **CHAPTER 3**

### **LITERATURE REVIEW**

In this section, previous research in two areas is reviewed. The first area focuses on eWOM literature. As background information, the computer-mediated-communication nature of eWOM is discussed first, followed by research on traditional face-to-face word of mouth. Then, previous studies on eWOM are reviewed. Especially, the research on market impact of eWOM is emphasized. The second area is concerned with text analysis methods. A history of linguistic analysis in academic research is briefly introduced first, followed by different approaches of linguistic analysis. Automatic text analysis (ATA) as the major method employed in this study is emphasized, and its validity in academic research is discussed.

#### **Review on Electronic Word-of-Mouth (eWOM) Research**

Henning-Thurau et al. (2004) defined electronic word-of-mouth (eWOM) as: “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.” EWOM is also called “online word-of-mouth” (Brown, Broderick, and Lee, 2007) or “word of mouse” (Dellarocas, 2003). EWOM is distributed through various Internet channels such as discussion forums, boycott websites, personal emails, chat rooms, instant messages, and youtube etc. Among these channels, the consumer review forum, a web-based consumer-opinion platform used by consumers to publicize and communicate their opinions, recommendations and complaints, is one of the most widely used eWOM formats, thereby attracting the greatest research interest from both

academicians and practitioners. There is increasing evidence that more and more consumers read online reviews before making a purchase decision. For example, a survey of 5,500 online consumers showed that 44% of respondents read online reviews in making buying decisions, and 59% of them believed that consumer online reviews were more useful than expert reviews (Piller, 1999). Given its importance to consumers, this study focuses on consumer eWOM through online reviews.

### **The Information Communicated through eWOM**

Because cognition and affection are direct results of consumption experience (Westbrook, 1987), the information communicated through eWOM includes both cognitive and affective components towards a product or service. Cognitive information is related to thinking processes such as learning, concept formation, logical inference, and problem solving (Lyons, 1999). In the case of eWOM, cognitive information contained in eWOM refers to consumers' cognitive evaluation about a product or service. Traditional consumer behavior literature assumed that consumers' cognitive process involves the evaluation of product attributes (Bettman, 1979). Later, some researchers (e.g., Sujana, 1985) suggested that cognitive response may be either piecemeal-based (attribute-by-attribute based evaluation) or category-based (heuristics based overall evaluation) evaluation response. Usually cognitive information is perceived to be "rational," and it is more likely to be distributed through the content of eWOM such as facts, numbers, reasoning, and inferences (Boonthanom, 2004). In addition, the usage of certain words may reflect consumers' cognitive processes, such as causation (e.g.,

because, effect, and hence) and insight (e.g., think, know, and consider) (Pennebaker, Mehl, and Niederhoffer, 2003).

Affection refers to the mental process related to feelings and emotions (Weiss and Cropanzano, 1996). In the case of eWOM, emotional information contained in eWOM is related to consumers' feelings and emotions towards a product or service. Consumption emotions can be conceptualized either as distinctive categories of emotional experiences such as happiness, sadness, and anger or as structural dimensions underlying emotional categories such as positive emotions and negative emotions (Dolen, Lemmink, Mattsson, and Rhoen, 2001). In this study, the terms of emotion and affect are used interchangeable, and both refer to the positive or negative valence of emotional experience, although affect is traditionally defined as the general category for mental feeling process and is broader than specific mental processes such as emotions and moods (Bagozzi, Gopinath, and Nyer, 1999).

Philips and Baumgartner (2002) summarized two mechanisms for the generation of consumption emotions. This first mechanism suggests that consumption emotions are a function of product performance. For example, Oliver (1993) found that consumption emotions were a result of consumers' judgment regarding product attributes. In other words, if a consumer perceives that the performance of a product/service is good, he/she will produce positive emotions toward the product/service; if the consumer perceives that the performance of a product/service is bad, he/she will produce negative emotions (Philips and Baumgartner, 2002). In another example, Mano and Oliver (1993) suggested two primary dimensions of product evaluation: utilitarian and hedonic judgment.

Utilitarian judgment is an assessment of a product's functional benefits and sacrifices such as economic value and price; hedonic judgment is defined as an assessment of a product's experiential benefits and sacrifices such as entertainment and escapism (Mano and Oliver, 1993; Hoffman and Novak, 1996). This study found that hedonic judgment leads to consumers' negative and positive affects. The second mechanism proposes that consumption emotions are a function of expectation and disconfirmation. For example, Westbrook and Oliver (1991) showed that both expectancy disconfirmation and need disconfirmation are related to consumers' positive and negative emotional dimensions. To resolve this debate about whether positive and negative emotions are derived from product performance or disconfirmation, Philips and Baumgartner (2002) conducted a laboratory experiment and concluded that consumption emotions are derived from product performance rather than from the disconfirmation of consumers' expectations. Above all, no matter which mechanism consumption emotions are derived from, emotions are parts of the consumption experience that consumers will communicate in their eWOM.

Since cognitive information is more likely to be delivered through content, qualitative content analysis is more appropriate to explore the cognitive information contained in eWOM. For example, Yang and Fang (2004) used qualitative content analysis to identify the cognitive information about dimensions of online service quality. Because content cues such as facts, reasoning, and figures about product attributes change consumers' cognitive beliefs (Albers-Miller and Stafford, 1999), in examining the effectiveness of eWOM, this study will incorporate content cues regarding major

qualitative dimensions. Since this study emphasizes the linguistic approach of eWOM, the emotion communication in eWOM, which is commonly conveyed by linguistic cues, is the focus of this study. This study will identify the linguistic cues utilized by consumers to communicate their emotions in eWOM and furthermore examine the roles of these linguistic cues in eWOM communication.

The communication of consumption emotions, as in all communication, follows a process of encoding, transmission, and decoding (Shannon and Weaver, 1963). Encoding includes emotional expression, i.e., the incorporation of cognitive and affective information into the message. Normally, emotions are expressed through multiple emotion cues such as verbal cues or nonverbal cues (Planalp, 1998). Verbal cues are emotion words or phrases in spoken or written language that indicate emotions such as happiness, sadness, and anger. Facial expressions, tone of voice, and body gestures are common examples of nonverbal cues. Communicating messages and emotional cues are then transmitted through communication channels to the receivers, who interpret or decode the messages. The decoding of emotional cues results in an emotional experience for the receivers. Since communication through eWOM is text-based, this study focuses on the encoding, transmission and decoding process of linguistic cues.

### **The Computer-Mediated-Communication Nature of eWOM and its Approaches**

eWOM communication is computer-mediated-communication in nature because consumer information is communicated through computer networks. However, as an emerging area, limited research attention has been paid to the media characters and the computer-mediated-communication nature of eWOM. The research on

computer-mediated-communication is relatively mature, and thus, the established research approaches from computer-mediated-communication literature may provide some insights into the research on eWOM communication.

There are two prevailing approaches in the computer-mediated-communication literature. The first stream is collectively called the cues-filtered-out approach (Culnan and Markus, 1987). According to this view, due to its text-only nature, computer-mediated-communication is characterized by a relative lack of physical and social cues. As a result, this approach believes that the absence of above cues leads to reduced capability for emotional exchange in computer-mediated-communication, resulting in less sociable, relational, understandable, and/or effective communication.

The stream includes three major theories: social presence theory (Short, Williams, and Christie, 1976), social context cues hypothesis (Kiesler, Siegel, McGuire, 1984; Sproull and Kiesler, 1986), and media/information richness theory (Daft and Lengel, 1984; Daft and Lengel, 1986). Social presence theory (Short, Williams, and Christie, 1976) maintains that nonverbal cues such as voice quality and vocal inflections, physical appearance, bodily movements, and facial expressions, which are typically associated with emotion expression, are absent in computer-mediated-communication. The reduction of nonverbal cues leads to lower social presence. Social presence is the feeling that one is involved with other people. Thus this theory predicts that compared to face-to-face communication, computer-mediated-communication lacks the capability for emotional communication.

Social context cues hypothesis (Kiesler et al., 1984; Sproull and Kiesler, 1986) argues that compared to face-to-face communication, computer-mediated-communication involves fewer social context cues, especially under the situation of anonymous online communication (Jessup, Connolly, and Tansik, 1990). Social context cues include aspects of the physical environment and actors' information (i.e., gender, status cues, and vocal inflection) that define the nature of the social situation and actors' relative status. On the one hand, the absence of such cues in computer-mediated-communication leads to increased uninhibited communication such as lower other orientation and higher status equalization (Kiesler et al., 1984; Siegel, Dubrovsky, Kiesler, and McGuire, 1986; Sproull and Kiesler, 1986). On the other hand, the absence of some social context cues that help to enhance to meaning of the message will reduce the capability of information communication.

Media richness theory (Daft and Lengel, 1984, 1986; Trevino, Daft, and Lengel, 1990; Trevino, Lengel, and Daft, 1987) suggests that communication across various media differs based on the band width and the number of cue systems available within them. This approach suggests that text-based computer-mediated-communication is a lean media, since it makes use of a single channel of communication. As a result, computer-mediated-communication is best suited for straightforward and concrete tasks (such as scheduling). In contrast, face-to-face communication is the "richest" medium since it employs multiple channel media, and thus it can be effectively used for complex and ambiguous tasks.

Some experimental research provided support for the cues-filtered-out approach. For example, some researchers (e.g., Hiltz, Johnson, and Turoff, 1986; Connolly, Jessup, and Valacich, 1990) found that that computer-mediated-communication is less personal and socio-emotional than is face-to-face communication. Argyle et al., (1970) found that non-verbal cues accounted for 10.3 times as much variance as verbal cues in interpersonal perception. Archer and Akert (1977) showed that subjects using verbal transcripts performed worse than those using videos in social interpretation. Accordingly, Rice and Love (1987) and Baron (1984) summarized that computer-mediated-communication would reduce the expressive potential of human language, leading to a more homogeneous, structurally simpler, less emotional, and less socially nuanced style of communication.

The second approach is based on social information processing theory (Walther, 1992). The approach suggests that in text-based computer-mediated-communication, although there are no nonverbal cues available, users can adapt to the medium, and use their language and other cues to overcome the relative shortage of cue systems and achieve their communication purpose. In other words, users employ linguistic characteristics of computer-mediated-communication to convey emotional information that would normally be expressed through nonverbal cues. For example, computer users have created different means such “emoticons” as “☺” “☹” to express their emotions through computer networks.

After the introduction of the social information processing theory approach, it has received significant research attention in recent years. A number of studies have provided

empirical support for social information processing theory and suggested that computer-mediated-communication may not be as ineffective as suggested by the cues-filtered-out approach. For example, Walther, Loh, and Granka (2005) found that affinity can be expressed equally effectively in both computer-mediated-communication and face-to-face communication conditions, and verbal cues carried a larger portion of the relational information in the computer-mediated-communication condition than in the face-to-face condition. Consistently, Berry, Pennebaker, Mueller, and Hiller (1997) found that language cues accounted for significant proportions of variance in interpersonal perception beyond traditional perception variables such as physical attractiveness and nonverbal expressiveness, and linguistic categories were the strongest predictors of perceived competence (Berry et al., 1997). Furthermore, Walther and Burgoon (1992) and Chidambaram (1996) found that computer-mediated-communication users can transfer social information in a manner similar to traditional face-to-face communication and thereby develop effective interpersonal relationships. Utz's (2000) research suggested that the use of emotions and affective scripts by online game players was a significant predictor of relationship development in that environment, accounting for 14% of the variance in users' frequency of friendly or romantic relationships online. Donohue, Diez, Stahle, and Burgoon (1983) concluded that computer-mediated-communication interactants compensated for reduced nonverbal affiliativeness with verbal cues in order to restore "normal" conversational style. Finally, some studies (e.g. Lea and Spears, 1995; Parks and Floyd, 1996) found that, given enough time, individuals can create fully formed impressions of others based solely on

linguistic content of written electronic messages. In addition, Foulger (1990) reported that experienced computer users rated several text-based media (including email and computer conferencing) “as rich” or “richer” than telephone conversations, television, and face-to-face conversation, refuting the “leanness” proposal for computer-mediated-communication suggested by media richness theory.

### **Review on eWOM Research**

In this section, previous studies on eWOM are reviewed. Since eWOM research was originally developed from traditional WOM research, a brief review of the traditional WOM research is provided first. Then, the current status of eWOM research is discussed, and the market impact of eWOM as the focus of this study is emphasized.

#### ***Traditional WOM Research***

Since WOM is an important market phenomenon, it has received serious research attention from different perspectives in traditional marketing and consumer research. WOM, as a consumer-dominated channel of marketing communication, is perceived to be more reliable, credible, empathetic, relevant, and trustworthy by consumers compared to firm-created information sources (Schiffman and Kanuk, 1995; Arndt, 1967; Bichart and Schindler, 2001), and it is believed to be more effective than traditional marketing tools such as personal selling and advertising (Katz and Lazarfeld, 1955; Engel, Blackwell, and Kegerreis, 1969).

Because of its potential impact on consumers, a major stream of WOM research focused on the outcomes of WOM by examining the influence of WOM on consumers. Repeatedly, research (e.g., Katz and Lazarfeld, 1955; Engel et al., 1969; Arndt, 1967;

Richins, 1983; Brown and Reingen, 1987; Bansal and Voyer, 2000; Bone, 1995) showed that WOM had a powerful influence on consumers' choices, perceptions, preferences, attitudes, intentions, purchasing behaviors, and post-usage judgment. Furthermore, some studies corroborated the findings across various products and services (Engel et al., 1969) as well as distinguishing between effects of positive versus negative WOM (Arndt, 1967; Richins, 1983). Compared to positive information, negative information is believed to be more thought-provoking, over-weighted, and perceived to be more diagnostic in judgment formation (Ahluwalia, 2002). Because such characteristics as intangibility, heterogeneity, and immensurability are associated with service quality, researchers (e.g., Berry and Parasuraman, 1991; Bansal and Voyer, 2000; Murray and Schlacter, 1990) agreed that WOM is more important for services than products.

Besides the WOM regarding product and service, WOM regarding retail stores was also explored by prior research. For example, Higie, Feick and Price (1987) identified different types of Word-of-Mouth communications about retailers. They found that consumers discussed some retail image dimensions (e.g., special sales and merchandise quality) more frequently than the others (e.g., retail employee and return policy), and some types of retailers (e.g. grocery store) more frequently than the others (e.g. department store). In addition, market mavens, which are defined as "individuals who have information about many kinds of products, places and facets of markets, and initiate discussion with consumers and respond to requests from consumers for market information" (Higie, Feick and Price, 1987), conducted WOM more frequently and provided more retail information about store dimensions than other consumers.

Some studies explored the antecedents of WOM effects. Satisfaction is regarded as the one of the most important antecedents of WOM (e.g., Anderson, 1998; De Matos and Rossi, 2008). For example, Anderson (1998) identified a u-shape relationship between customer satisfaction and the inclination to engage in WOM transfers. This means that extremely satisfied and extremely dissatisfied customers are more likely to initiate WOM than consumers with a moderate experience. Furthermore, Bansal and Voyer (2000) found that both non-interpersonal forces (receiver's expertise, receivers' perceived risk, and senders' expertise) and interpersonal forces (ties strength and how actively WOM is sought) exerted significant effects on receivers' service purchase decision. Wangenheim and Bayon (2004) found that the strength of WOM influence was determined by perceived communicator characteristics (similarity and expertise). Furthermore, perceived risk dimension moderates these effects. Gilly, Graham, Wolfenbarger, and Yale (1998) showed that WOM partners' characteristics (demographics and product expertise) and their attitudinal homophily are important in determining the interpersonal influence of WOM. De Matos and Rossi (2008) conducted a meta-analysis in order to identify the antecedents of WOM and the moderators of the relationships between WOM and its antecedents. This study found that: WOM valence is a significant moderator of the relationships between the antecedents and WOM activity; cross-sectional studies show a stronger influence of satisfaction and loyalty on WOM activity than longitudinal studies; studies of WOM behavior show a weaker link between loyalty and WOM activity than studies of WOM intention. In addition, they found that satisfaction has a stronger

relationship with positive WOM than loyalty, whereas disloyalty has a stronger relationship with negative WOM than does dissatisfaction.

Some studies investigated the motivation of WOM. For example, Dichter (1966) identified four main motivational categories of positive WOM communication: product-involvement, self-involvement, other involvement, and message involvement. Furthermore, Engel, Blackwell, and Miniard (1993) modified Dichter's typology and added the motive of dissonance reduction as a major motivation for negative WOM communication. After that, Sundaram, Mitra, and Webster (1998) proposed a more comprehensive framework for the motives of WOM communication. This study identified eight motives, including four motives for positive WOM and the other four motives for negative WOM. It found that generally product involvement is the most important driver for positive WOM, followed by altruism, self-enhancement, and help for the company. Vengeance is the most important motive for negative WOM, followed by anxiety reduction, altruism, and advice-seeking. However the motives are varied for different categories of WOM topics such as product performance, employee behaviors, and price/value perceptions.

In recent years, the social network approach has received increasing attention in WOM research. For example, Brown and Reingen (1987) suggested that social ties played an important role in WOM communication and compared the differences of WOM effects originating from weak ties versus strong ties. Duhan, Johnson, Wilcox, and Harrell (1997) examined the factors that determined the likelihood of consumers using strong-tie sources (e.g., friends and family) and weak-tie sources (e.g., acquaintances or

stronger) of recommendations. They found that consumers chose weak ties when instrumental cues were important to them and they had higher levels of subjective knowledge.

### ***Current Research on EWOM***

Although WOM has received great attention by marketing and consumer researchers, it has never become a major stream of marketing research. The advent of the Internet has dramatically expanded the scale and scope of consumers' word-of-mouth communications, and the market power of eWOM has increased at an unprecedented rate. As a result, WOM communication through the Internet is increasingly becoming a hot topic in consumer and marketing research. Especially, consumer online forums are emerging as alternative sources of information to mainstream mass media in consumer and marketing research (Dellarocas, 2006). Compared to other Internet media, such as company websites and online advertising, the information from consumer online forums has greater credibility and relevance, and is more likely to evoke empathy (Bickart and Schindler, 2001).

Consistent with the major research stream in traditional WOM research, much research attention on eWOM has been paid to the market impact of eWOM. Growing evidence has shown that both consumers' purchasing decisions and behaviors and firms' sales are influenced by reviews posted in consumer online forums. For example, Gruen, Osmonbekov, and Czaplewski (2006) reported that customer know-how exchange influenced customers' perceptions of product value (received benefits in relation to cost or sacrifice) and likelihood to recommend the product, but customers' repurchase

intentions. Bounie, Bourreau, Gensollen, and Waelbroeck (2005) suggested that both offline information sources (specialized magazine and trial versions) and online reviews had a significant positive effect on video game purchases. Based on their experiments, Park, Lee and Han (2007) found that both the quality and quantity of online reviews had a positive effect on consumers' purchasing intention, and furthermore, low involvement consumers were affected by the quantity rather than the quality of the reviews, but high involvement consumers were affected by review quantity mainly when the review quality was high.

Researchers have tried to understand the role played by eWOM in marketing from different perspectives. For example, Dellarocas, Awad, and Zhang (2004b) and Godes and Mayzlin (2004) argued that consumers' online reviews provide an easy and cost-effective opportunity to measure word of mouth and can be used to forecast product sales or distributions. Chen and Xie (2008) proposed that online consumer reviews can serve as a new element of the marketing communications mix and work as free sales assistants to help consumers identify the products that best match their idiosyncratic usage conditions. Joeckel (2007) argued that average user ratings along with online press ratings can be used as an indicator for the latent variable "perceived quality," and furthermore found that the latent variable of perceived quality explains up to 15% of the sales of a video game. Dellarocas (2006) found that strategic manipulations of Internet online forums such as anonymously posting online review praising its own products, or bad-mouthing those of its competitors, would influence firm profits and consumer surplus.

Furthermore, some studies compared the market impact of eWOM with that of other media, especially expert opinions. For example, Dellarocas, Farag, and Zhang (2004) found that the valence of user ratings was the most significant explanatory variable of movie box office, and it was more influential in predicting movie box office than average professional critic reviews. Furthermore, Chakravarty, Liu, and Mazumdar (2008) found that, compared with infrequent moviegoers, frequent moviegoers are less influenced by online user comments but more influenced by experts' critical reviews. In addition, frequent moviegoers are more resistant to negative user comments than infrequent consumers, but not to the negative comments that come from professional reviewers. The result of this study implies that consumer online reviews may mainly influence those less involved consumers, and professional critics are still needed, especially for the high involved consumers.

Most of the above studies that empirically examined market outcomes (i.e., product revenues and diffusion) resulting from eWOM focused on either the volume (the total amount of online reviews) or the valence (whether the online reviews are positive or negative) of eWOM, or both. Previous studies (e.g., Chevalier and Mayzlin, 2006; Dellarocas, Awad, and Zhang, 2004b) have provided relatively consistent evidence that the volume of eWOM has a significant effect on product sales or diffusion. For example, Chevalier and Mayzlin (2006) found that the higher number of reviews at an online book retailer led to higher sales at that website. Similarly, Dellarocas, Awad, and Zhang (2004b) found that the total number of user reviews posted helped to predict both first week box-office revenues as well as total box-office revenues. Finally, Joeckel (2007)

found that the volume of reviews was positively related to the penetration rate of video games. However, findings regarding the impact of the valence of eWOM on the product sales or diffusion are inconsistent. For example, Liu (2006) found that the volume rather than the valence of user ratings has a significant explanatory power for box-office revenue. In contrast, Chavalier and Mayzlin (2006) found that favorable consumer ratings had a positive influence on book sales, concluding that an improvement in a book's average review score led to an increase in relative sales from the website. Furthermore, Dellarocas et al. (2004b) found that the valence of user ratings was the strongest predictor of future revenues, and had a greater influence on future revenues than did average professional critical reviews.

Aside from the major streams of research on the market impact of eWOM, some studies examined the consumers' motivation for engaging in online WOM. For example, Hennig-Thurau et al. (2004) found that eWOM participants exhibited a similar set of motivations as participants of traditional WOM. Social benefits are the strongest motive for consumers' visit frequency to online forums, followed by extraversion/positive self-enhancement, and concern for other consumers. Social benefits also provide the strongest motive for the number of review writing, followed by economic incentives, concern for other consumers, and extraversion/positive enhancement.

As in the traditional WOM, the approach based on social network analysis has received increasing research attention in recent years. Especially, the research on online eWOM communities is emerging because online communities essentially represent WOM networks, in which individuals with a common interest share with others their

information and knowledge (Cothrel, 2000; Kozinets, 1999; Hoffman and Novak, 1996). For example, Gruen, Osmonbekov, and Czaplewski (2006) proposed a model that examined antecedents and outcomes of consumer know-how exchange in Internet mediated communities. This model showed how consumer know-how exchange created value (received benefits in relations to cost or sacrifice) for the marketing organizations beyond the value that consumers perceived directly through exchanges with the organization. This model suggested that consumer know-how exchange had a direct relationship with loyalty intuitions as well as an indirect relationship that was mediated through overall value of the firm's offering. Moreover, Brown, Broderick and Lee (2007) compared offline and online social network constructions for eWOM based on a set of qualitative interviews and social network analysis.

Besides the above quantitative research, some studies on eWOM are conceptual or qualitative in nature as in other emerging areas. For example, Boush and Kahle (2001) proposed that consumer online reviews provided a good opportunity to understand and respond to consumers, and furthermore suggested methods for evaluating negative information in online discussion based on qualitative content analysis and signal detection theory. In addition, Kozinets (2002) created a framework for netnography research, which is a qualitative research technique that employs an ethnographic research method to study online customers.

### **Literature Review on Linguistic Analysis Method**

One important limitation of the literature on market impact of eWOM is that most previous studies have focused on the volume or the star rating of online reviews and

neglected any information that is contained in the actual text reviews. However, because of the text-based communication nature of eWOM, text reviews contain rich consumer information, some of which may not be captured by overall star ratings or the volume of online reviews. The lack of an effective text analysis method that can efficiently deal with a huge volume of text is one of the major reasons for this limitation. To fill this gap, one purpose of this study is to introduce the automatic text analysis method into eWOM research and test the validity of this method in studying eWOM. A literature review on quantitative text analysis method is provided here.

Since language is the major channel through which individuals' opinions and emotions are communicated and the information about individuals' internal states and psychological processes is embedded in language (Kleij and Musters, 2003), linguistic content analysis can provide insights into individuals' cognition process, emotional expression, health, individual differences, and psychopathology (Pennebaker and King, 1999). As a result, linguistic analysis has been used in academic research for several decades. For example, from the 1980's, verbal data have been widely used to study cognitive processes in psychology. Especially, concurrent and retrospect verbal reports have been recognized as major sources of data on subjects' cognitive processes (Anderson, 1987). Besides psychology, text analysis is significant to other fields of research, such as linguistics, sociology, anthropology, computer science, and statistics (Kleij and Musters, 2003). Applications of linguistic analysis can be found in a wide range of topics, including information retrieval (Berry, Dumais, and O'Brien, 1995), content analysis (Weber, 1990), modeling of human conceptual knowledge (Landauer,

Foltz, and Laham, 1996), and characterizing the quality of essays (Foltz, 1996) etc. Researchers (e.g., Kleij and Musters, 2003) have proposed that linguistic analysis is promising to become a complementary method for measuring individuals' feelings, attitudes, and emotions and overcoming the limitations of widely used self-report measures. Linguistic analysis has not attracted enough research attention in marketing and consumer research. However, with the increase in consumer online communication, it is expected that both marketing and consumer researchers will benefit from introducing linguistic analysis methods into their research. The data sources of linguistic analysis could be speech, face-to-face-communication, or text etc. This study focuses on text analysis.

### **Internet and Text Analysis**

The advent of computer and Internet has dramatically changed the way of communication among individuals. Communication through Internet channels such as email, instant messages, online forums, and websites has become an inseparable part of modern people's daily lives, which has created a digital world of words (Kock, 2004). Unlike other traditional channels such as face-to-face or telephone, communication through Internet and computers is characterized as text-based. In other words, in a typical online communication, an information sender types a message, which is communicated via Internet, and then read as text by an information receiver (Herring, 1996). Since the textual data on the Internet contain rich information of individuals and communities, more and more researchers have begun to pay attention to the Internet and treat it as a

medium to get gain access to the large amount of authentic information initialed by individuals (Kamps and Marx, 2002).

The huge amount of textual information from the Internet has revealed both opportunities and challenges to researchers. On the one hand, since this Internet information is initiated by individuals in their natural situation, linguistic analysis, especially text analysis, provides a new channel to understand what individuals think or what they do. For example, currently hundreds and thousands of customer reviews regarding products or services have been posted on the Internet. Text analysis of these reviews may provide important information about consumers' attitudes, preferences, and behaviors. If properly used, text analysis can help manufacturers or retailers better understand and respond to their consumers, and thereby enhance customer patronage while advancing the companys' image (Yang and Peterson, 2003). On the other hand, how to effectively use the accumulated text data from the Internet is a big challenge to researchers. Since most of the information from the Internet is textual in nature, which cannot be analyzed by statistical software directly, there is a great need for effective tools to deal with the huge amount of text information reliably and quickly in academic research. Given the volume and format of online textual data, the appropriate approach to understand this data is to develop text mining methods for large-scale text data.

### **The Approaches of Text Analysis**

Currently, there are two major approaches to text analysis in academic research. The first one is qualitative content analysis. The second approach is quantitative content analysis.

In consumer research, the qualitative approach of text analysis has received great research attention in the past ten years. For example, Boush and Kahle (2002) discussed qualitative content analysis methods for evaluating negative information in online discussion. Yang and Fang (2004) employed qualitative content analysis to analyze consumers' online reviews in order to generate online service quality dimensions. After Kozinets (2002) proposed a framework for netnography research, many studies have been carried out based on this approach. The netnography approach is a qualitative research technique that employs an ethnographic research method to study online customers (Kozinets, 2002). It uses the information publicly available in online forums to identify and understand the needs and decision influences of relevant online consumer groups (Kozinets 2002). However, although extensive qualitative analysis has provided valuable information about consumers' psychological processes and purchasing behaviors, conducting a thorough and reliable qualitative analysis and validating the results is both time-consuming and labor-intensive. Moreover, qualitative analysis can not provide direct evidence for causality, and its result has limited generalizability (Creswell, 2007).

In recent years, quantitative text analysis methods have made rapid progress. The quantitative analysis approach breaks from the subjective interpretation tradition of qualitative content analysis, and treats texts as objective data that can be processed in a rigorous and replicable way. In addition, the output of quantitative content analysis can be directly used in conventional methods of statistical analysis. Some marketing researchers have made initial attempts to use the quantitative approach in eWOM research. For example, Liu (2006) employed human coders to code the valence of

consumer online reviews and then used the valence to predict movie box sales. However, in dealing with a large number of texts from the Internet, it is time-consuming and labor-intensive to use human coders to transfer qualitative information into quantitative numbers. Furthermore, it is impossible for human coders to stay consistent and efficient in a prolonged coding process. Therefore, an efficient quantitative method of text analysis must be capable of dealing with a large volume of text information quickly and consistently.

### **Automatic Text Analysis (ATA)**

The advent of computer-based quantitative text analysis programs makes it possible to quantitatively code a vast amount of text quickly and reliably. Computer-based content analysis is also called automatic text analysis (ATA). It has been defined as a method that automatically extracts statistically manipulable information about the presence, the intensity, or the frequency of thematic or stylistic characteristics of textual material (Shapiro and Markoff, 1997). ATA eliminates subjectivity and the propensity for human errors in content analysis, making the result of text-based analysis easily replicable and statistically manipulable. Up to now, several quantitative text analysis methods have been developed, such as thematic content analysis, the General Inquirer, the Gottschalk-Gleser method of content analysis, and Weintraub's analysis of verbal behavior etc. (Benoit, Laver, and Mikhaylov, 2009). Pennebaker, Mehl, and Niederoffer (2003) provided a review of eight ATA programs used in psychology. This study focuses on one of the programs-Linguistic Inquiry and Word Count (LIWC, Pennebaker et al. 2001).

Linguistic Inquiry and Word Count (LIWC) uses a word count strategy that operates by comparing each word of a given text to an internal dictionary consisting of 2300 words to calculate the percentage of words falling into a number of grammatical (e.g., pronouns, articles, and prepositions) and psychological (e.g. words indicating emotional, cognitive, or social processes) categories. The word count strategy employed in LIWC is based on a series of assumptions (Berry et al., 1997; Bestgen, 1994). It is assumed that the words people use convey psychological information over and above their literal meaning and are independent of their semantic context. For example, the words people use in their daily lives reliably convey information of individuals' demographics, personality, and social and psychological worlds (Chung and Pennebaker, 2007; Fast and Funder, 2008). It is expected that the percentage of emotion-related words used within a given category is a reliable and valid measure of a speaker's emotional states (Aplers et al., 2005; Kahn et al., 2007). For example, the more an individual uses negative emotion words, the more such usage is presumed to reflect his or her feeling of higher degrees of negative emotions. Data from a series of validation studies (e.g., Pennebaker and Francis, 1992; Pennebaker et al., 2001; Aplers et al., 2005; Kahn, Tobin, Massey, and Anderson, 2007) have provided empirical evidence of the validity and reliability of this method.

### **ATA as an Alternative or Supplement to Self-Report Measures**

The significance of introducing ATA into academic research also lies in the possibility that ATA may provide a promising alternative or at least a supplement to the widely used self-report measures. For example, Kleij and Musters (2003) suggested that

text analysis can overcome some of the limitations of self-report measures and provide additional information beyond self-report measures. Furthermore, Bantum and Owen (2009) found that self-report positive and negative emotions are not highly correlated with ATA indicators. This result indicates that linguistic analysis and subjective self-report measures of emotional expression may provide different perspectives on the individual experience of emotions. As a result, they suggested that linguistic indicators should be considered as a supplement to self-report measures.

Current researchers rely heavily on self-report measures (i.e., self administered survey) in evaluating individuals' attitudes, emotions, and behaviors, because such measures are relatively easy to obtain and are sometimes the only feasible way to assess constructs of interests (Donaldson and Grant-Vallone, 2002). Especially in marketing and consumer research, self-report measures dominate the literature. However, self-reports are prone to many kinds of response bias (Donaldson, Thomas, and Graham, 2002; Graham, Collins, Donaldson, and Hansen, 1993; Schwartz, 1999). For example, Schwarz (1999) commented that "self-reports are a fallible source of data, and minor changes in question wording, question format, or question context can result in major changes in the obtained results."

The most frequently found sources of method bias in self-report measures are concerned with acquiescence, social desirability, and common method variances (Spector, 1987). Acquiescence is the tendency for a respondent to agree or disagree with all items, regardless of content. Social desirability is the tendency for a respondent to choose the socially desirable response, regardless of the veracity of that response (Arnold and

Feldman, 1981). In other words, subjects tend to under-report attitudes or behaviors deemed inappropriate by researchers or other observers, and they tend to over-report behaviors viewed as appropriate. Such bias is most likely to occur when test items are ambiguous or when tests are poorly developed (Cronbach, 1950). Common method bias occurs when all variables in a study are measured by one method of measurement. In many marketing and consumer studies, all the variables are measured by subjects' self reports, resulting in a certain amount of common method bias. In other words, the common method variance accounts for considerable shared variance among self-reported measures. As a result, inferences about correlation and causal relationships may be inflated (Borman, 1991; Donaldson, Thomas, Graham, Au, and Hansen, 2000; Spector, 1994). Schmitt (1989) suggested that solely using self-report measures in a study is unacceptable. To avoid the methodology problems of self-reports, researchers have proposed different alternatives, such as using more objective measures such as peer reports and introducing anonymity or using specific response formats that do not require participants to answer sensitive question directly (Kring, Smith, and Neale, 1994).

Quantitative text analysis provides a potential alternative to the self-report measures, and may help researchers to overcome some shortcomings of these measures and provide additional explanation power. For example, linguistic indicators are less subject to conscious manipulation and offer another approach to non-reactive assessment. Online reviews occur naturally among consumers as a function of their experience with a product or service (Godes and Mayzlin, 2009). Although a person might be capable of consciously influencing the content of what is written, she or he will not be able to

change the manner in which it is expressed, i.e., the language and words that are used. Furthermore, online reviews are written under the situation of non-solicitation and anonymity. Although a consumer has a net id, others will never know his/her real identification. Because of the anonymity, consumers are less likely to be subject to social desirability and manipulations, and they may have a chance to get away from the social class, rituals, obligations, and taboos. As a result, they may be more open and more likely to disclose their real feelings and information. Thus, compared to self-report measures, linguistic analysis is more objective because it eliminates some potential bias of human coders such as social desirability and individual preference (Pennebaker and Francis, 1999; Tian, Yanm, and Stewart, 2005). It is less also likely to be subject to above method bias and has the advantage of measurement reliability (Wolf, Pfeil, Lotz, and Biddle, 1994). In addition, compared to self-reports, employing online textual data and ATA has some other advantages for studying eWOM. For example, combing online data and ATA can gain access to the information of a big population quickly and cost-effectively since it is relatively easy to collect hundreds or even thousands of reviews for a certain popular product or service on the Internet. In contrast, it would be very costly and time-demanding to collect self-report measures from so many subjects by using traditional survey methods.

Above all, ATA provides a promising method for eWOM research. It may overcome the limitation of self-report measures and provide a promising alternative, or at least a supplement to self-report measures.

## **The Validity of LIWC**

This study focuses on LIWC. As a new method in studying eWOM, the reliability and validity of this method is discussed first. After introducing LIWC, its creators have initially assessed the validity and reliability of the program. For example, Pennebaker et al. (2001) found that inter-rater reliability discrimination of category word elements has been found to range from 86% to 100%, depending on the dimension being assessed, suggesting content validity. Furthermore, Pennebaker, Mayne, and Francis (1997) employed four judges to rate 210 essays on several LIWC dimensions and found moderate to strong correlations ( $r= 0.22- 0.75$ ) between LIWC and judges' global ratings of written essays for most emotion categories. This provided some evidence of construct validity. In addition, Mehl and Pennebaker (2003) and Pennebaker and King (1999) showed that words that people use in their spoken and written language are both relatively stable over time and yet sensitive to change, supporting the reliability of LIWC-derived measures.

Some recent studies by other researchers provided more evidence for the validity of LIWC. For example, Aplers et al. (2005) evaluated the content validity, construct validity, and concurrent validity of LIWC in the context of communication in Internet support groups. This study showed content validity of LIWC by finding that LIWC scores on most of the selected word categories and human ratings were moderately correlated. This indicated that LIWC captured a high percentage of words in the on-line messages. Moreover, this study found support for construct validity by comparing means of multiple texts written under different instructions. Finally, this study found evidence for

concurrent validity: the LIWC scores correlated significantly with the corresponding categories in the ratings completed by the human raters.

Bantum and Owen (2009) examined the validity of two popular text analysis programs: LIWC and Psychiatric Content Analysis and Diagnosis (PCAD) in the context of emotional expression in an Internet-based intervention for women with breast cancer. The author concluded that LIWC is superior to PCAD for rapid identification of emotional expression in text. Furthermore, LIWC shows better convergence and discriminant validity. Also, the author found that although the computerized coding methods captured most of the emotion identified by raters, both LIWC and PCAD over-identified emotional expression. Finally, the authors suggested that textual data can be used to objectively measure emotional expression, and linguistic indicators should be considered as a supplement to self-report data.

Kahn et al. (2007) employed three experimental studies to assess the validity of the LIWC with respect to measuring text-based emotional disclosures. This study focused on two major specific and discrete emotions: sadness and amusement. Experiment 1 found that more positive emotion and positive feeling words were used to describe an amusing event than either a sad or a neutral event, and more negative emotion and sadness/depression words were used to describe a sad event than either an amusing or neutral event. Both experiment 2 and 3 used emotionally provocative film clips to manipulate the momentary experience of sadness and amusement. Experiment 2 found that verbal cues such as positive emotion and negative emotion significantly distinguished between momentary experiences of sadness and amusement. Experiment 3

showed that there was a weak relation between LIWC counts and individual difference in emotional expression. Overall, the results of the three experiments indicated that word use is a meaningful indicator of emotional expression and LIWC has convergent and discriminant validity in measuring emotional expression of sadness and amusement.

Above all, these studies indicate that LIWC appears to be a valid and reliable tool in measuring emotional expression in text-based communication. However, the validity of LIWC in studying eWOM has never been examined before. This study intends to address this issue and examine the validity of LIWC in studying eWOM.

## CHAPTER 4

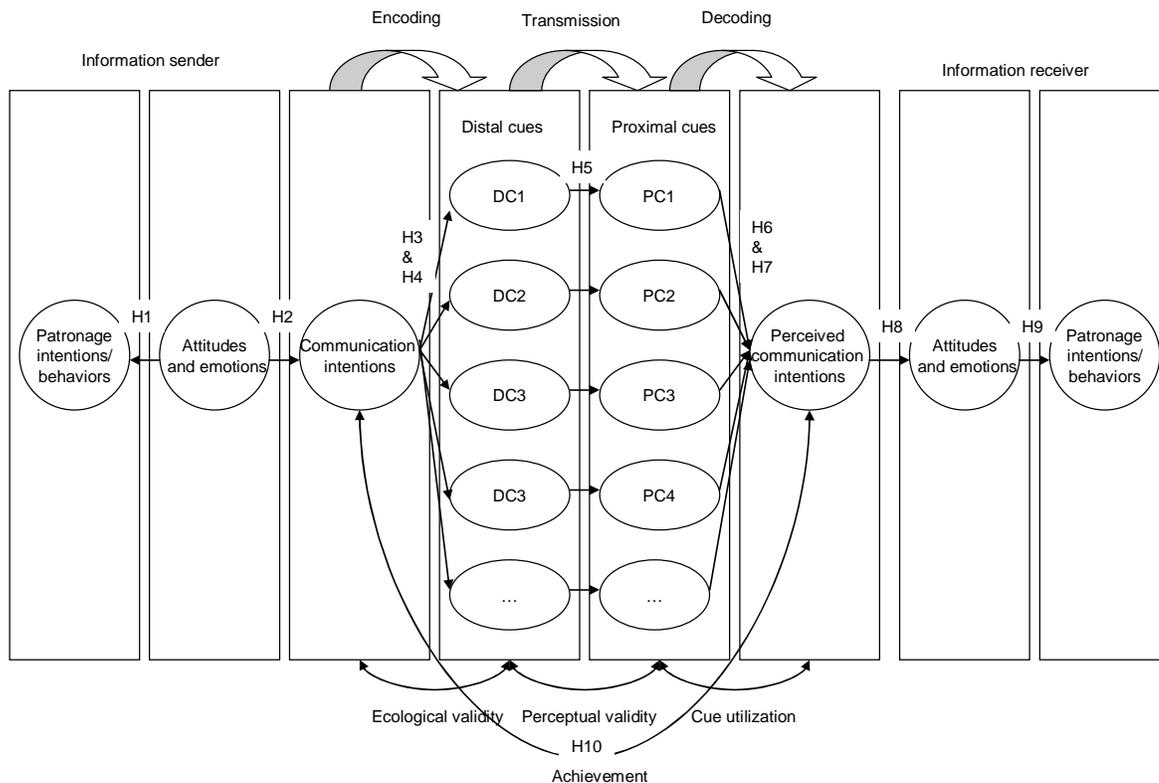
### HYPOTHESIS DEVELOPMENT

In order to fill the research gaps in the existing literature and achieve the research objectives of this paper, a Process Model of eWOM Communication and a Simplified Model of eWOM Communication are developed in this study. Since these two models have been briefly discussed in chapter 2, this study focuses on explaining the hypothesized relationships in these two models in this chapter.

#### **Hypothesis Development in Process Model of eWOM Communication**

One important objective of this study is to examine the effectiveness of eWOM communication in terms of to what extent the attitudinal and affective information communicated by eWOM senders can be perceived accurately by eWOM receivers and furthermore influence the eWOM receivers' attitudes, emotional states, and future purchasing intentions toward a product/service. To achieve this objective, a Process Model of eWOM Communication is developed based on a modified Brunswik's Lens Model (Brunswik, 1956; Gifford, 1994; Hammond and Stewart, 2001; Scherer, 2003). In this Process Model, cues utilized by eWOM communication partners are identified first, and then the effectiveness of information communication within each component of the eWOM communication process is examined in terms of ecological validity, perceptual validity, cue utilization, and achievement. Furthermore, the effectiveness of eWOM communication is examined by measuring the influence of eWOM communication on eWOM receivers' attitudes, emotions, and future patronage intentions. The hypothesized

relationships in the Process Model are presented in Figure 4.1 and will be discussed following the information flow in the eWOM communication process.



*Figure 4.1* Hypothesized Relationships in Process Model of eWOM Communication

### **Communication Intentions**

According to the Process Model for EWOM Communication (PMEC), the eWOM communication process starts from eWOM senders' attitudes and emotional states toward a product/service. On the one hand, attitudes and emotional states toward a product/service help eWOM senders develop their future patronage intentions toward the product/service. The predictive utilities of attitudes and emotional states on consumers' future patronage intentions have been widely supported by numerous studies (e.g., Oliver,

1980). In turn, this information contributes to the establishment of eWOM senders' communication intentions. Communication intentions mean how positive or negative a product/service is to eWOM senders who want to convey this information to the public and hope eWOM receivers will perceive this information accurately. Communication intentions include both the attitudes and emotions that eWOM senders intend to communicate to other consumers, which are named intended attitudes and intended emotions respectively.

eWOM senders' communication intentions may not be perfectly consistent with their real attitudes and emotional states toward a product/service, which may cause a gap between eWOM senders' attitudes and emotional states and their communication intentions. The process of developing communication intentions involves the selective display of certain emotions in particular situations. Camras (1985) termed this process as channeling. There are several ways of channeling, including simulation (displaying or feigning an emotion when no such emotion or feeling is present), inhibition (giving the impression of having no feelings when one truly is experiencing an emotion), intensification (giving the appearance of having stronger feelings than one actually has), deintensification (giving the appearance of experiencing an emotion with less intensity than one is actually feeling), and masking (communicating an emotion that is entirely different than the one the person is experiencing) (Shennum and Bugental, 1982). For example, it is very likely that an angry customer intentionally exaggerates his/her bad experience and negative emotion in online reviews to demean a product. Furthermore, some individual difference factors may also influence this link. For example, some

individuals are not comfortable showing emotions to others, and they may intentionally hide or suppress their real feelings (Planalp, DeFrancisco, and Rutherford, 1996). Overall, consumers' actual attitudes and emotions toward a product/service may not be perfectly reflected in their eWOM communication intentions. However, consumers' attitudes and emotions should be highly correlated with their eWOM communication intentions. Otherwise, a high difference will produce high dissonance among the consumers.

*H1 eWOM senders' attitudes and emotional states toward a product/service will predict their future patronage intentions.*

*H2 eWOM senders' attitudes and emotional states toward a product/service will predict their communication intentions.*

### **Encoding**

After eWOM senders determine how positive or negative an online review is that they want to communicate to other consumers, the next step for them is to transfer these intentions into communication cues in eWOM. These cues are called distal cues by the Brunswik's Lens Model since they are distant from the observers. Different distal cues are associated with different emotions and cognitions, and thereby helping eWOM senders deliver their attitudes or emotional information (Juslin, 2000; Scherer, 2003). However, the encoding process may not be perfect and some information may be altered or missed during the encoding process (Scherer, 2003). For example, since human emotion is complex, it is possible that in some situations an individual's emotional states may not be able to produce reliable externalizations in the form of specific linguistic cues. However, an eWOM sender expects that the cues contained in eWOM can be identified

by the eWOM readers and then eWOM readers can infer their communication intentions based on these cues. As a result, eWOM senders are motivated to encode their attitudes and emotions into distal cues. Furthermore, words and other linguistic characteristics have been widely perceived as carriers of individuals' emotions and attitudes (Hancock, Landrigan, and Silver, 2007). For example, Hancock, Landrigan, and Silver (2007) found that positive versus negative emotion can be communicated in text-based interaction through both verbal strategies (e.g., use of affect words) and nonverbal strategies (e.g., use of punctuations). Furthermore, Bohanek, Fivush, and Walker (2005) showed that negative narratives contain more negative emotion words, cognitive processing words, and passive sentences than positive narratives, and positive narratives contain more positive emotional words and are more structurally complex than negative narratives. Thus, it is very likely that linguistic cues in text reviews can be used by consumers to transfer their attitudes and emotional states toward a product/service. As a result, eWOM senders' communication intentions should be highly correlated with distal linguistic cues. The correlations between communication intentions and distal cues are termed as ecological validity in Brunswik's Lens Model.

As discussed in literature review, there are two kinds of information contained in eWOM communication. The first kind is affective information towards a product/service. Boonthanom (2004) suggested that cognitive information is mainly conveyed through content. As to eWOM, it is very likely that eWOM senders' cognitive information is communicated through some content cues such as objective descriptions or factual information related to different features of a product or service. Research in advertising

termed the approach that uses objective content cues to communicate product information as rational appeals (Stafford and Day, 1995), and some empirical studies (e.g., Aaker and Stayman, 1990) found that rational appeals are the best predictors of consumers' attitudes toward the brands advertised. This study focuses on three types of rational appeals or content cues identified by Cutler and Javlgi (1993) and Holbrook and Lehmann (1980): (1) Factual claims. Factual claims mean objectively verifiable descriptions of the attributes and features of a product or service. Factual claims include facts, numbers, or scientific research results etc. (2) Comparisons. Comparisons refer to the explicit comparisons of the attributes of the focused product with those of other products. (3) Uniqueness. It refers to the explicit testable claim of the uniqueness of the focused product. Some studies on print advertising (e.g, Cutler and Javlgi, 1993; Holbrook and Lehmann, 1980) have shown that these content cues have significant impact on consumers' attitudes and emotions. In a similar situation, we expect that the content cues play important role in eWOM communication.

The second kind of information contained in eWOM communication is affective information. Affective information communication is referred to as emotional appeal in advertising research (Johar and Sirgy, 1991), and some studies (e.g., Johar and Sirgy, 1991) on advertising have found that emotional appeal plays an important role in persuading consumers. Some previous studies (e.g., Boonthanom, 2004; Bohanek, Fivush, and Walker, 2005) found that affective information can be communicated through linguistic cues. However, while traditional communication studies have focused exclusively on the nonverbal cues, little attention has been paid to the role of verbal cues

in communication and emotion expression (Hancock et al., 2007). Since eWOM is text-based communication in which nonverbal cues such as body movement and facial expression are eliminated, understanding the relationships between linguistic cues and emotion communication is particularly important in understanding the eWOM communication process.

Previous studies (e.g., Reilly and Seibert, 2003; Boonthanom, 2004; Planalp, DeFrancisco, and Rutherford, 1996) have identified three types of linguistic cues that individuals may use for text-based eWOM communication.

*Emotion words.* Emotion words refer to the words with positively or negatively valenced emotions (Reilly and Seibert, 2003; Bantum and Owen, 2009). Positive emotion words show that a person is expressing a state of positive emotion such as happiness, peacefulness, or gratitude; negative emotion words indicate that there is a demonstration of negative motion such as anger, disappointment, and sadness (Pennebaker and King, 1999). Consumers may use emotion words as cues when expressing or interpreting their attitudes or emotions toward a product or service. For example, it is common that an individual tells others about his/her emotional experience directly by using emotional words, such as “I am satisfied with the product” or “I am mad with the service provider” (Shimanoff, 1987, 1985). Studies (e.g., Kahn et al., 2007) in psychology found that writing about a positive event was associated with significantly more positive emotion and positive feeling words than writing about either a sad or neutral event; writing about a sad event was associated with a significantly higher number of negative emotion words than writing about an amusing or a neutral event. As a result, it is expected that the

number of positive emotion words used in an online review is significantly related to a consumer's positive emotional states or attitudes toward a product/service, and the number of negative emotion words used is significantly associated with a consumer's negative emotional states toward the product/service.

*Linguistic markers.* Linguistic markers refer to verbal cues other than emotional words that individuals use to communicate type and intensity of their emotions (Reilly and Seibert, 2003). This study focuses on three types of linguistic markers: indirect phrase and metaphor, intensifiers and reducers, and hedges. Some researchers (Cross, 1979; Kovecse, 1990) argue that in many situations individuals do not talk about their emotions directly, but instead they express their emotions by using revealing indirect phrases or metaphors (e.g., "It drives me up the wall"; "I can't believe that they are doing this to me"; "I am on cloud nine"). Planalp, DeFrancisco, and Rutherford (1996) defined statements that do not contain an affect word but from which others could infer a positive or negative emotional state as indirect reference to emotional states. Since indirect phrases and metaphors can help individuals express their impressions and emotions, it is expected that the number of indirect phrases or metaphors in an online review is significantly associated with consumers' attitudes and emotional states toward a product/service.

The other two groups of linguistic markers considered in this study are recommended by Labov and Waletzky (1967) and Reilly and Seibert (2003). Both of these two studies suggested that some words can help to reveal the degree of the intensity of or the certainty of individuals' attitudes and emotions. Lexically, linguistic markers are

presented as the forms of intensifiers (e.g., so, very, and rally), reducers (e.g., less quite, and a bit), or hedges (e.g., maybe, look-like, and possibly). Intensifiers and reducers indicate the degree of the intensity of the attitudes or emotions. Hedges show the certainty of the emotions or attitudes. Overall, it is expected that message senders will utilize linguistic markers as verbal cues to express their attitudes and emotions.

*Paralinguistic cues (Non-verbal Cues).* Paralinguistic cues refer to message characteristics in text-based computer-mediated-communication used to convey meanings normally achieved via tone of voice, body gesture, and other behavior in face-to-face communication (Boonthanom, 2004). Carey (1980) identified five categories of patterns of paralinguistic cues used in text-based computer-mediated-communication: vocal spelling, lexical surrogates, spatial arrays, manipulation of grammatical markers, and minus features. Vocal spelling includes non-standard spelling of words which brings attention to sound qualities. Vocal spelling may serve to mark a regional accent or an idiosyncratic manner of speech to attract attention to the word, such as “weeeell” and “y'all” (Carey, 1980). Lexical surrogates mean that people use words to describe their “tone of voice” in the message. Such surrogates may be inserted as a parenthetical comment within a sentence, in which case it is likely to set a tone for the sentence (Carey, 1980). For example, they may be added at the beginning or end of a message, and may then set the tone for the entire message, such as “Boo, Boo, horror of horrors. This product does not seem to serve its purpose” (Carey, 1980). In addition, lexical surrogates (e.g., “Uh hum, hmmm, yuk yuk”) are written commonly within the body of texts. Spatial arrays are techniques often employed by CMC users to draw pictures using the standard

English characters and numbers available on keyboards (Carey, 1980). It is the most striking feature of computer-based communication. Examples of this feature are emoticons such as :-) (smile) , :-( (frown), and :-D (laugh). In addition, consumers can leave spaces between words to indicate pause, or run words together to indicate the quickening of tempo (Carey, 1980). Manipulation of grammatical markers means to use such features as capital letters, periods, commas, quotation marks, parentheses, and exclamation marks to indicate pause, express attitude toward lexical items, and signal a change of voice by the composer (Carey, 1980). For example, people may use three exclamation markers at the end of a sentence to emphasize the intensity of an emotion. Individuals can emphasize a word in the middle of a sentence by capitalizing it. Finally, minus features refer to an absence of certain elements in normal composition. For example, there is a lack of paragraphing or capitalization or there are misspellings in the texts (Carey, 1980). Minus can convey a relaxed tone or quickness of pacing. Overall, linguistic indicators may serve as distal cues and help consumers to encode and deliver their communication intentions through eWOM.

To summarize, different types of distal cues are discussed in this section. It is proposed that certain types of attitudes and emotions are represented by a unique pattern or configuration of content or linguistic cues in eWOM communication. In the light of the Process Model of eWOM Communication, this means that the attitudes and emotional states of eWOM senders are externalized by a specific set of content and linguistic cues. Without such unique patterns of distal cues for different emotions and attitudes, eWOM

senders' attitudes and emotional states could not be communicated reliably to other consumers.

In addition, each online review includes a star rating and a text review. EWOM senders may use both star ratings and the linguistic cues in the text review to convey their attitudes and emotions. Star ratings are consumers' overall evaluations toward a product/service. In contrast, content cues and linguistic cues contained in the text reviews reflect consumers' detailed evaluations and emotions regarding different aspects of the focused product/service. As a result, star ratings and distal cues may capture different aspects of consumers' mental states. Thus, it is expected that distal content cues and distal linguistic cues explain additional variance in eWOM senders' communication intentions beyond and above star ratings.

*H3 EWOM senders' communication intentions will be significantly correlated with distal cues.*

*H4A Distal cues will predict eWOM senders' communication intentions.*

*H4B Distal cues will explain additional variance in eWOM senders' communication intentions beyond and above the star ratings*

### **Transmission (Perception)**

After eWOM senders type their reviews containing distal cues onto the Internet, the next step of the eWOM communication is the transmission or perception of the information. In this process, distal cues are transmitted from eWOM senders to eWOM receivers, and distal cues are converted into proximal cues (Scherer, 2003). The observed proximal cues could differ from the eWOM senders' distal cues because some

information may be missed or distorted during the information transmission process (Scherer, 2003). For example, some distal cues created by eWOM senders may not be perceived by eWOM receivers (Planalp, DeFrancisco, Rutherford, 1996); at the same time, eWOM receivers may identify some linguistic characteristic as proximal cues, but in fact these linguistic characteristics are not the cues intentionally encoded by eWOM senders. As a result, proximal cues may not perfectly coincide with distal cues. In this study, the degree to which distal cues correlate with proximal cues is called perceptual validity. A close resemblance of proximal cues to distal cues indicates the effectiveness of the transmission of cues. In other words, the more the distal cues are perceived by information receivers, the more likely the information transmission process is successful. Because eWOM readers are eager to collect the information about a product or service, they are motivated to comprehend as precisely as possible the cues transferred by eWOM senders. We therefore propose that there are significant correlations between distal cues and proximal cues.

***H5 The proximal cues detected by eWOM receivers will be significantly correlated with the distal cues encoded by eWOM senders.***

### **Decoding**

After the perception of proximal cues, eWOM receivers will decode these cues and transfer the cues into meanings and emotions that help them identify the attitudes and emotions delivered by eWOM senders. In other words, decoding is the process in which eWOM receivers infer the eWOM senders' attitudes and emotional states toward a product/service by observing the proximal cues (DeRosia, 2009). Some researchers (e.g.,

Boonthanom, 2004; Albers-Miller and Stafford, 1999) have suggested that information receivers are able to detect information senders' attitudes and emotions by identifying proximal cues such as content cues, emotion words, linguistic markers, and paralinguistic cues. Content cues such as facts, reasoning, and figures, on the one hand, may change consumers' cognitive beliefs (Albers-Miller and Stafford, 1999), and on the other hand may elicit consumers' emotions (Frijda, 2000; Holbrook and Batra, 1987). For example, an objective description of a high quality product may result in positive emotions such as liking and happiness in consumers (Frijda, 2000).

Linguistic cues help to convey emotional information. For example, Hancock, Landrigan, and Silver (2007) found that naïve observers were able to detect an expresser's emotional states through linguistic cues, such as negations and exclamation points. Furthermore, Boonthanom (2004) found that individuals can identify the email communication partners' emotions through the linguistic cues used in their emails, and they noted that their perception of emotion is significantly associated with the number of emotional words, linguistic markers, and paralinguistic cues.

Although it is possible that proximal cues may reliably reflect the valid distal cues, the decoding or inference mechanism is not perfect (Scherer, 2003; Bernieri, Gillis, Davis, and Grahe, 1996). Because of individual difference or conditional constraints, the same proximal cues may produce different interpretations for different decoders. For example, for an overall star rating of 3 out of 5, some consumers may think it is a good product, but others may think it is not good at all. Thus, even if observed cues are the same, different eWOM receivers may make different inferences about the attitude and

emotional state of the eWOM senders. But overall, we propose that eWOM receivers' perceptions about the communication intentions of eWOM senders should highly correlate with the proximal cues identified by eWOM receivers. The more proximal cues are identified by eWOM receivers, the more likely they are able to perceive the communication intentions of eWOM senders accurately. The correlations between proximal cues and eWOM receivers' perceptions are termed cue utilization by the Brunswick's Lens Model. It measures the effectiveness of the decoding process. In other words, it indicates to what extent proximal cues are utilized in perceiving the eWOM senders' communication intentions.

In addition, as discussed in the justification of H4A and H4B, star ratings, content cues, and linguistic cues may capture different aspects of consumers' mental states. This study proposes that both proximal content cues and proximal linguistic cues explain unique variances of eWOM receivers' perceived communication intentions beyond and above the star ratings.

***H6 eWOM senders' communication intentions perceived by eWOM receivers will be significantly correlated with the proximal cues detected by eWOM receivers.***

***H7A Proximal cues detected by eWOM receivers will predict the eWOM senders' communication intentions perceived by eWOM receivers.***

***H7B Proximal cues detected by eWOM receivers will explain additional variance in the eWOM senders' communication intentions perceived by eWOM receivers beyond and above the star ratings.***

## **Outcomes of eWOM**

The outcome of eWOM communication includes eWOM receivers' impression formation toward a product/service and furthermore the establishment of their future patronage intentions and behaviors toward the product/service. The impression formation includes developing both attitudes and emotional states toward the product or service, which leads to the establishment of future patronage intentions. The impression formation and intention establishment is a direct outcome and a measure of the effectiveness of eWOM communication. The received attitudinal and emotional information from eWOM senders may change eWOM receivers' attitudes and emotional states toward the product/service. For example, attitudes may change information receivers' beliefs about the product/service (Albers-Miller and Stafford, 1999). Emotions are contagious, and perceived emotions may influence the emotional states of eWOM receivers (Schoenewolf, 1990). Especially when a consumer has no information about a product or a service, he/she may observe the emotions displayed in the reviews and then adopt and apply the emotions toward the product or service as a result of a desire to search for social information. Textual information in online reviews may therefore alter eWOM readers' attitudes and affective states toward a product or service accordingly. In addition, numerous studies (e.g., Oliver, 1980) have shown that attitudes and emotional states are predictive of consumers' future patronage intentions and behaviors, although the prediction is not perfect. For example, a consumer may have positive attitudes and emotional states toward a product/service, but he/she may not necessarily intend to patronize the product/service because he/she already has a good product/service provider.

But in general an individual's attitudes and emotional states towards a product/service should be significantly associated with his/her future patronage intentions towards the focused product/service.

*H8 eWOM receivers' perception of eWOM senders' communication intentions will predict their attitudes and emotional states toward a product/service.*

*H9 eWOM receivers' attitudes and emotional states toward a product/service will predict their future patronage intentions toward the product/service.*

### **Achievement**

The curved line linking WOM senders' communication intentions and eWOM receivers' perceptions of eWOM senders' communication intentions represents what Brunswik (1956) called achievement or functional validity. It indicates to what extent eWOM receivers are able to infer the actual information that eWOM senders intend to deliver. High achievement rate occurs when eWOM receivers precisely perceives eWOM senders' attitudes and emotional states toward a product/service. In other words, high achievement rate indicates that eWOM senders' product information is correctly incorporated into distal cues. Most of these distal cues are perceived by eWOM receivers as proximal cues, and eWOM receivers appropriately interpret the proximal cues in their judgment. Achievement shows the effectiveness of the eWOM communication process.

In daily communication, individuals can readily identify the emotional states and opinions of their communication partners through text-based communication (e.g., Hancock, Landrigan, and Silver, 2007; Boothanom, 2004). The way in which people use words conveys a great deal of information about themselves, their audience, and the

situation they are in. In an eWOM context, there is a strong incentive for the online review writers to make sure that the readers can grasp their intended meanings and emotions from the textual content. Therefore, online review writers try to convey their evaluations, emotions, and attitudes via the appropriate use of linguistic cues. Also there is a strong incentive for the readers of online reviews to reveal senders' evaluations, emotional states, and attitudes as much as possible through their perceptions of linguistic cues. It is expected that review readers might capture the internal states and meanings of review writers through text communication. Thus, it is proposed that eWOM receivers' perceptions about eWOM senders' communication intentions should be significantly correlated with eWOM senders' self-report communication intentions.

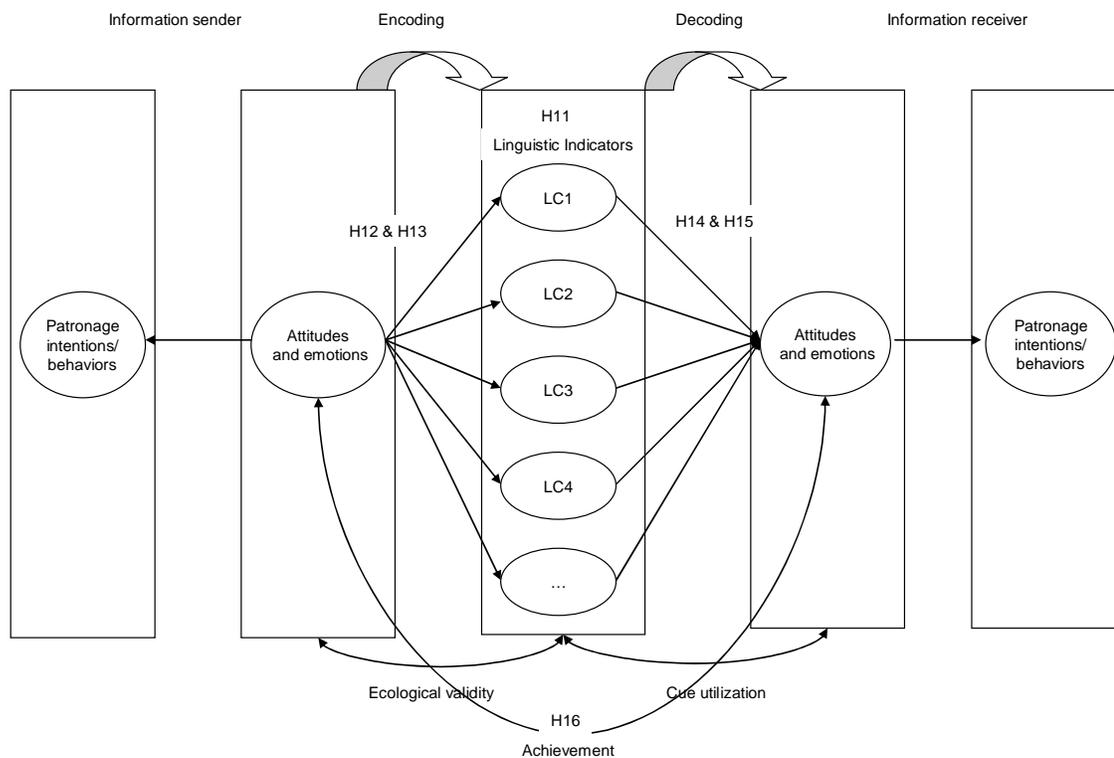
***H10 eWOM sender's self-reported communication intentions will be significantly correlated with communication intentions perceived by eWOM receivers.***

The effectiveness of the eWOM communication process can be evaluated by operationalizing and measuring each of the elements in the Process Model of EWOM Communication (PMEC), such as achievement, ecological validity, cue utilization, and perceptual validity. Since the model covers the whole process of eWOM communication, it is very useful in identifying the sources of information missing or faulty links of the chain. If eWOM was not communicated effectively, an error could occur in any link of the communication processes. In addition, the effectiveness of eWOM communication can also be measured by the formation of eWOM receivers' impression and patronage intentions toward the product/service. An effective eWOM communication should be able to lead to significant attitudinal or intention changes in the eWOM receivers. Overall,

the Process Mode of eWOM Communication provides a comprehensive and systematic tool for examining the eWOM communication process among consumers.

### **Hypotheses Development in Simplified Model of EWOM Communication**

One important purpose of this study is to verify the ATA method, especially the predictive validity of the linguistic indicators generated by ATA, in studying eWOM. To achieve this purpose, this study proposed a simplified eWOM communication model. In this model, ecological validity, cue utilization, achievement, and predictive validity are examined. Furthermore, the relationships between linguistic indicators and self-report explicit measures were examined, and the predictive utilities of linguistic indicators on consumers' attitudes were evaluated. The hypothesized relationships within the Simplified Model are presented in Figure 4.2 and will be discussed in the following sections.



*Figure 4.2* Hypothesized Relationships in Simplified Model of eWOM Communication

### **The Relationships between ATA Indicators and Communication Cues**

To validate the simplified model, a fundamental question is whether ATA indicators can capture the essential meanings of distal and proximal cues identified by eWOM partners. Only under the situation that the answer to this question is “Yes”, ATA indicators can be used to substitute distal and proximal cues. Since eWOM is text-based communication, in order to create an effective communication, eWOM writers need to encode their own attitudes and affective information regarding a product/service into linguistic cues first, and these linguistic cues are then perceived by eWOM readers. In the communication process, both distal cues encoded by eWOM senders and proximal cues

identified by eWOM receivers are linguistic indicators in nature. ATA is an effective tool in identifying the linguistic cues in text files (Pennebaker and Francis, 1999). The basic assumption of ATA is that linguistic cues can provide insights into an individual's psychological processes, including personality characteristics, cognitive processes, emotional states, and motivations (Pennebaker, Mehl, and Niederhoffer, 2003). In other words, information about individuals' internal psychological processes and emotional states can be translated into and conveyed via emotional words or other linguistic characteristics. Because the function of the ATA is to identify these linguistic cues from texts, it is very likely that ATA can identify the distal cues and proximal cues contained in eWOM communication since all linguistic cues are used to reflect eWOM senders' internal psychological processes and emotional states.

There are many categories of linguistic indicators. The most important categories are those associated with emotions and attitudes and have predictive utility in predicting eWOM partners' attitudes and emotions. Previous studies have identified some significant relationships between linguistic indicators and individuals' self-reported emotions and attitudes. For examples, information senders with positive emotions used more positive emotions words, fewer negations, fewer first person pronouns, and more other oriented pronouns; information senders with negative emotions used more negations and negative emotion words, more first person pronouns (Hancock, Landrigan, and silver, 2007; Bohanek, Fivush, and Walker, 2005). Weitaub (1989) found that the use of 1st person singular pronouns was associated with negative affective states. Hancock, Landrigan, and silver (2007) found that expressers with higher positive emotions used

fewer negations and more exclamation marks than expressers with lower positive emotions. At the same time, consumers use positive emotion words and negative emotion words to communicate their emotional states and attitudes. Thus, we propose that linguistic indicators associated with positive emotions and attitudes including Positive Emotions, and its sub-categories including Positive Feelings and Optimism and Energy are positively associated with the communication cues of positive emotion words and negatively associated with the communication cue of negative emotion words; linguistic indicators associated with negative emotions including Negations, First Person Pronouns, Negative Emotions, and its subcategory of Anger are positively associated with eWOM partners' communication cue of negative emotion words and negatively associated with eWOM partners' communication cue of positive emotion words.

*H11A The linguistic indicators associated with positive emotions and negative emotions will be significantly associated with eWOM senders' distal cues of positive emotion words and negative emotion words.*

*H11B The linguistic indicators associated with positive emotions and negative emotions will be significantly associated with eWOM readers' proximal cues of positive emotion words and negative emotion words.*

### **Encoding and Decoding**

In this study, consumers' attitudes and emotions regarding a product or service are measured by self-report measures such as star rating, attitudes and emotional states. On the other side, linguistic indicators can reflect consumers' emotional states and attitudes. One important research question concerns what is the nature of the relationship between

self-report measures and linguistic indicators and how much variance they share with each other. Little is known about the relationships between linguistic indicators and individuals' self-report measures of related constructs (Owen et al., 2006).

The relationships between the two forms of measurement raise an important methodological question as to what aspects of memory are being tapped by each type of the two methods. Subjective ratings require participants to condense their entire memory experience into very few global responses (Bohanek, Fivush, and Walker, 2005). Text writing uses fine-grained, specific, and concrete information in memory. From the above analysis, it is expected that the two types of measurement capture different types of memories and as a result, may provide distinct information about an individual. Owen et al. (2006) found that self-report measures were uncorrelated with text analysis indicators, and furthermore concluded that text analysis indicators "seem to be measuring something different than what participants themselves tell us." However, as is discussed above, language usage is diagnostic of individuals' mental, social and even physical states, and linguistic indicators reflect the consumers' emotional states or cognitive processes. In eWOM, consumers intend to communicate their own opinions, feelings, and emotions with other consumers by encoding their evaluative and emotional information into linguistic cues. Consumers' emotional states and attitudes toward a product/service are traditionally evaluated by self-reported measures. Since ATA can also capture a eWOM partner's emotions and attitudinal information contained in eWOM, it is expected that the linguistic indicators should be significantly correlated with and able to predict eWOM partners' self-reported attitudes and emotional states.

Each online review includes a star rating and a text review. Star ratings have been widely used to predict eWOM partners' attitudes and emotional states toward a product or service. Linguistic indicators, as objective indicators generated from text reviews, can also be used to predict eWOM partners' attitudes and emotional states. As discussed above, linguistic indicators may capture different aspects of eWOM partners' attitudes and emotions from the information captured by their self-reported overall evaluations. Thus, we propose that linguistic indicators explain additional variance in eWOM partners' attitudes and emotions beyond and above the star ratings.

***H12 Linguistic indicators associated with positive or negative emotions will be significantly correlated with eWOM senders' self-report attitudes and overall emotional states toward the product/service.***

***H13A Linguistic indicators will predict eWOM senders' self-report attitudes and overall emotional states toward a product/service.***

***H13B Linguistic indicators will explain additional variance in eWOM senders' attitudes and overall emotional states toward a product/service beyond and above the star ratings.***

***H14 Linguistic indicators associated with positive or negative emotions will be significantly correlated with eWOM readers' self-report attitudes and overall emotional states toward a product/service.***

***H15A Linguistic indicators will predict eWOM readers' self-report attitudes and overall emotion states toward a product/service.***

*H15B Linguistic indicators will explain additional variance in eWOM readers' attitudes and overall emotional states toward a product/service beyond and above the star ratings.*

### **Achievement**

In the eWOM context, eWOM writers have strong incentives to make sure that eWOM readers can grasp their intended meanings and emotions. Therefore, online review writers are motivated to convey their evaluations, emotions, and cognitions via the linguistic indicators. On the other side, eWOM readers try to reveal eWOM senders' evaluations, emotional states, and feelings through their perception and interpretation of linguistic cues. It is expected that review readers could capture the internal states and meanings of review writers through text-based communication, and furthermore the perceived valenced information may shape their impression toward the product or service. Thus, this study proposes that eWOM receivers' emotions and attitudes toward a product/service are significantly correlated with eWOM senders' corresponding self-reported emotions and attitudes toward the product/service. This relationship is termed as achievement in the Brunswik's Lens Model.

*H16 EWOM senders' self-report attitudes and overall emotional states toward a product/service are significantly correlated with eWOM readers' self-report attitudes and overall emotional states toward the product/service.*

## **CHAPTER 5**

### **METHODOLOGY**

In the study, two phases of web-based self-administrated survey data collection were employed (See Appendix A for research protocol). The first phase focused on the encoding process while the second phase investigated the decoding process. Before the study, a pilot study had been conducted to generate the distal cues employed by eWOM senders and the proximal cues detected by eWOM receivers. This study used restaurants as the research context because restaurants are closely related to individuals' daily lives and very likely to become a subject of eWOM communication.

#### **Pilot Study: Focus Group**

Two focus group interviews (see Appendix B for interview questions) with seven students in each group were conducted first to generate the distal cues and proximal cues used in eWOM communication about restaurants. One focus group was used to generate distal cues and the other was used to generate proximal cues. The participants of the focus groups were undergraduate students recruited from three business classes at a major northeastern university. Fifteen dollars were provided to each participant as an incentive for participating in each focus group. The participants were required to be 18 year or older. Before the first focus group, each of the participants had been asked to write an online review about a local restaurant based on their own experience, and the participants were told that their reviews will be published in an online forum and will be anonymous. During the focus group, participants were asked to recall and discuss the cues or strategies that they had used in writing the online reviews in order to effectively

communicate their attitudes and emotions about the focused restaurant to other consumers.

The second focus group was used to generate proximal cues. Before the focus group, seven participants had been asked to read two reviews written by the participants of the first focus group and to infer the online review authors' attitudes and emotional states towards the focused restaurants. Then, these participants were asked to discuss what cues in the online reviews they had detected in order to perceive the attitudes and emotional states communicated by the online review authors. Based on the two focus groups and a thorough literature review of related studies, a list of distal cues and proximal cues was developed and then used to develop the questionnaires for the surveys.

### **Web-Based Survey**

Two phases of web-based self-administered survey data collection were employed as the predominate method of data collection in this research. Compared to traditional data collection methods, web-based surveys have some advantages. For example, they are fast and convenient, and have no burden for data entry. They are cost-efficient for collecting data from a large number of respondents who may be geographically dispersed. Although some researchers question the representativeness of an online sample, after comparing the results from online and offline studies, Gosling, Vazire, Srivastava and John (2004) concluded that findings based on Internet samples are consistent with the findings based on traditional samples.

## **Sampling**

For the two phases of web-based data collection, national samples of 230 and 155 adult consumers were purchased from a professional online survey company (i.e., Zoomerang). Zoomerang has more than 2.5 million members in the U.S., and characteristics of its sample are comparable with those reported by the U.S. census concerning gender, age, income and ethnicity (Markettools, 2006). The only underrepresented groups among consumers in the panel include the youngest age group, the lowest income group, and African Americans. The survey research firm sent invitations to randomly selected consumers from its consumer panel and continued to collect responses until the target number of responses was received.

All participants in this study were 18 year or older and had some experience in either reading or writing online reviews. No compensation was directly offered to the subjects by the investigator. However, the online survey research firm routinely awards the participants cumulative points (ranging from 25 to 150 points per survey; this study offered 100 points) redeemable for merchandise and services such as popular movies, music, electronic products and gift cards (ranging from 1,000 to 10,000 points). Panelists also earn entries into the monthly cash sweepstakes totaling \$5,000 each month.

## **Survey Procedures**

The encoding phase was studied first. Zoomerang sent emails to a random sample of its consumer panel to announce the current project and invite them to go to the website and fill out the survey. When consumers logged into the survey website, they first encountered the following screening question: "Have you had any memorable positive or

negative experience at a local restaurant in the past three months?” Those consumers who answered “Yes” to the question continued survey. After the screening question, participants were asked to complete a survey section about their restaurant involvement and current emotional states. After completing the baseline survey section, participants were instructed to recall their experience with a local restaurant and then answer some questions about the restaurants, such as their overall star ratings, emotional states, attitudes, and future patronage intentions toward the restaurants. Then, participants were instructed to write an online review about the restaurants based on their experience. The instruction was “Please recall your experiences with the restaurant you indicated in the last section. Imagine that you are invited by a popular consumer online review forum to write a review about this restaurant. You are told that your review will be posted on its website to help other consumers who visit your city/town with their restaurant choices. Please write your review for this website in the textbox below.” It was suggested that the subjects write reviews that were between 120 and 300 words in length.

After writing the reviews, participants were asked to fill out another two survey sections. The first section included consumers’ communication intentions. The second section asked participants to indicate to what extent each communication cue had been used in writing their reviews in order to communicate their attitudes and emotions to the other consumers. Finally, participants completed questions regarding individual differences (including experience with online reviews, need for cognition, emotional expressivity, and trust on online reviews) and demographic variables (including gender,

age, education, household income and ethnicity). The complete questionnaire for Phase 1 is shown in Appendix C.

In the first phase of data collection, 230 completed responses were collected. Because all reviews needed to be analyzed by LIWC linguistic analysis software, 111 reviews that had longer than 80 words from the reviews written in Phase 1 were selected. Although the recommended text length for LIWC analysis is 100 words, it is a conservative recommendation but not a mandatory requirement. The general rule is that a text should not be too short to be reliably analyzed and there is no empirical evidence on what should be the cut-off for the minimum length. On the other hand, in the real world, some websites such as Amazon ([www.amazon.com](http://www.amazon.com)) invite their customers to write online reviews longer than 75 words. Thus, a cut-off of 80 words was chosen to balance the 100-word recommendation of LIWC analysis and the 75-word suggestion of popular websites. Among the 111 reviews, six were dropped because they were not reviews about restaurants (e.g., they were related to a bar or one kind of specific food) or had too many typos to be readable. This resulted in 105 usable reviews.

In the second phase, the decoding process was studied. Before the data collection, the 105 usable reviews collected from Phase 1 were randomly divided into 35 groups with each group containing three reviews. Then, the 50 states of the U.S. were divided into 35 groups such that each group had roughly the same population size for potential respondents. States that have large populations such as California, Florida, New York and Texas were further divided into counties. For example, New York state was divided into two groups according to its population: group 1 (Kings, Queens, New York, Suffolk, and

Bronx) and group 2 (other counties). Each population group was randomly linked to one of the 35 groups of reviews. During the survey, after a respondent answered a question about which state they currently resided in, the survey website automatically linked that respondent to the assigned group of reviews according to their area of residence.

During the second phase survey, after participants logged in the survey website, they completed a baseline section first, including their experience with online reviews, restaurant involvement, need for cognition, emotional expressivity, trust in online reviews, and current emotional states. Then, participants were asked to indicate which state (county) they currently lived in. Based on the answer, each participant was linked to one of the 35 groups of reviews (three reviews per group): each participant was instructed to read three online reviews. The instruction for reading online review was “Imagine that you are going to visit City X and plan to have dinner at a restaurant in that city. You have never been to City X, so you check the Internet for restaurant information. On a consumer online review forum, you found three reviews about three different restaurants. These three reviews are listed in the each of three following sections. Each section includes one review followed by a set of questions about that review.” After reading each review, participants were asked to complete two survey sections: the first section included perceived attitudes and emotional states of review authors, their own attitudes and emotional states, and patronage intentions toward the focused restaurant; the second section asked participants to indicate to what extent each communication cue had been detected in reading the reviews. The questionnaire used in the Phase 2 of data collection is shown in Appendix D.

### **ATA Analysis**

The reviews written by the encoding group were analyzed by a computer-aided text analysis method in order to generate linguistic indicators. The written reviews were first spell-checked and then input in the text analysis software. In this study, Linguistic Inquiry and Word Count (LIWC, Pennebaker et al., 2001) was employed for several reasons. First, LIWC extracts quantitative information, making it amenable to inferential statistical analysis. Second, LIWC not only analyzes basic grammatical features of texts, but also provides information about important psychological processes (e.g., Positive Feelings and Anger). Third, LIWC operates automatically and eliminates the burden of manual coding. Fourth, LIWC is currently the most widely used and extensively validated ATA tool in psychology. Numerous studies have successfully applied this software in academic research (for overviews see Chung and Pennebaker, 2007; Pennebaker et al., 2003), and several studies have employed it in the context of Internet research (e.g., Lyons, Mehl and Pennebaker, 2006; Mehl, 2005; Cohn, Mehl, and Pennebaker, 2004).

### **Operational Definition of Variables**

A summary of the measures for each construct is presented in Appendix E.

*Star rating.* Star rating is an overall rating that a consumer gives to a product/service. This variable was adapted from the rating system used in popular online review forums such as [www.dine.com](http://www.dine.com) and [www.epinions.com](http://www.epinions.com). Subjects were asked to provide their overall ratings for a restaurant on a 5-star scale.

*Attitudes.* Attitude indicates a consumer's valenced feelings about a product or service. The measures of attitudes were adapted from Holbrook and Batra (1987) and Stafford (1996). EWOM partners' attitudes toward the focused restaurant were measured by four items with 7-point semantic differential scale. The four items include bad-good; unsatisfactory-satisfactory; unfavorable-favorable; and negative- positive.

*Emotional states.* The emotional states of eWOM partners toward a restaurant were operationalized as overall positive emotions, overall negative emotions, and discrete emotions. The overall positive (or negative) emotions toward a restaurant were measured by consumers' self-report of their overall positive (or negative) emotion toward a restaurant on a 7-point Likert scale ranging from 1(Not at all) to 7 (Extremely). The measures for discrete emotions toward a restaurant were adapted from Bagozzi, Baumgartner, and Pieters (1998), Olney, Holbrook, and Batra (1991), and Chaudhuri and Buck (1995). The measures consist of 4 adjectives measuring discrete positive emotions and 7 adjectives measuring discrete negative emotions. For each item, participants were asked to rate their specific emotion toward a restaurant on a 7-point Likert scale ranging from 1(Not at all) to 7 (Very much).

*Communication intentions.* Communication intentions refer to the degree of positivity or negativity of the evaluation toward a product/service that an eWOM sender intends to communicate with other consumers and expects that eWOM receivers can perceive it. Consistent with eWOM senders' attitudes and emotional states, eWOM senders' communication intentions were operationalized as their intended attitudes and intended emotional states toward the focused restaurant. The measures for intended

attitudes and intended emotional states were similar to those of eWOM senders' attitudes and emotional states. The only difference between them was the questions asked. For intended emotional states, the question was: "When you wrote the review, to what extent did you want to get across the following emotions toward the restaurant to review readers?" For intended attitudes, the question was: "What is the attitude toward the restaurant that you wanted to get across to review readers and hope they can learn from your review?"

*Perceived communication intentions.* Perceived communication intentions refer to eWOM receivers' perception of eWOM senders' communication intentions. Consistent with eWOM senders' communication intentions, eWOM receivers' perceived communication intentions were operationalized as eWOM receivers' perceptions regarding eWOM senders' emotional states and attitudes toward the focused restaurant. The measures for perceived communication intentions were similar to those of communication intentions. The only difference was the questions asked. For perceived attitudes, the question was: "What do you think is the attitude toward the restaurant that the online review author intended to get across to review readers?" For emotional states, the question was: "To what extent do you think did the review author intend to the communicate each of following emotion toward the restaurant to review readers?"

*Patronage intentions.* Future patronage intentions were measured by three items adapted from Gotlieb and Sarel (1991) and Yi (1990). Participants rated future patronage intentions on a 7-point bipolar scale. The three items in this scale include possible/impossible, likely/unlikely, and probable/improbable.

*Distal cues.* Based on a comprehensive literature review and two focus groups, nine distal cues were identified including food, service, environment, price, positive emotion words, negative emotion words, intensifiers, reducers, and indirect phrases. Following Averill's (1982) basic approach, eWOM senders were asked to recall to what extent each communication cue had been used when they wrote their online reviews. Each distal cue was rated on a 7-point Likert scale ranging from 1 (Not at all) to 7 (Very much).

*Proximal cues.* Based on a comprehensive literature review and two focus groups, nine reliable proximal cues were identified including food, service, environment, price, positive emotion words, negative emotion words, intensifiers, reducers, and indirect phrases. Following Averill's (1982) basic approach, participants were asked to indicate to what extent each communication cue had been used in the online reviews after they read the online reviews. Each proximal cue was rated on a 7-point Likert scale ranging from 1 (Not at all) to 7 (Very much).

*LIWC indicators.* Linguistic indicators were generated by LIWC from online reviews. This study focused on those linguistic indicators associated with valenced emotions and attitudes, especially the linguistic indicators measuring emotion words. The LIWC categories of emotion words are in hierarchical structure. At a higher level, there are two broad sub-categories including Positive Emotions (e.g., happy, pretty, and good) reflecting positively valenced emotions and Negative Emotions (e.g., hate, worthless, and enemy) reflecting negative valenced emotions. At a lower level of the hierarchy are five discrete emotion categories. The Positive Feeling category reflects specific pleasant emotions (e.g. happy, joy, and love), and is a subset of Positive Emotions. The second

subset of Positive Emotion is Optimism and Energy (e.g., certainty, pride, and win). Three subsets of Negative Emotions are Anxiety/Fear (e.g., nervous, afraid and tense); Anger (e.g., hate, kill, and angry), and Sadness/Depression (e.g., grief, cry, and sad.). In addition, some other categories associated with valenced emotions and attitudes including Negations, First Personal Pronouns, and Money etc. were also identified. All the linguistic indicators of word counts are expressed as a percentage of the total number of words, controlling for the length of the writing sample.

## **CHAPTER 6**

### **DATA ANALYSIS AND RESULTS**

This chapter consists of three sections. The first section presents preliminary data analysis to provide an overview of respondent characteristics and a description of major variables in the models. The second section explains the result of hypothesis testing. The third section includes some additional exploratory analyses which intend to provide further understanding on the eWOM communication process beyond that explained by the hypothesized relationships.

#### **Preliminary Data Analysis**

##### **Sample Size and Respondent Characteristics**

This study had two phases of data collection (see details in the methodology section). In the first phase, each respondent was asked to write an online review, and then answer questions about the review. Two hundred and thirty completed responses were collected in this phase. However, only 105 reviews that were longer than 80 words were kept. In the second phase, another group of consumers were asked to read a group of three reviews written in the first phase and then answer questions about the reviews. One hundred and fifty five respondents completed the survey in this phase. After dropping unreliable responses, 90 reviews remained in the data-set. Finally, answers to questions about the 90 reviews by both review authors from Phase 1 and review readers from Phase 2 were merged to form the final dataset for data analysis. The 90 reviews were written by 90 respondents in Phase 1 respectively, and read by three to six readers out of 134

respondents in Phase 2. The mean, standard deviation, and range for the text lengths of the 90 reviews were 150, 55, and 80 to 407 words respectively.

The characteristics of the respondents are described in Table 6.1. For authors of the 90 reviews, the descriptive analysis showed that 41.1% of them were male and 58.9% were female. The majority (81.1%) of the authors was white. Around three quarters of the authors were younger than 55, and approximately half of them were between 35 and 54. Around three quarters of the authors had at least a bachelor's degree. Around half of the authors had an annual household income between \$50,000 and \$99,999, and one quarter of the authors had a household income higher than \$125,000.

For the 134 review readers, the descriptive analysis showed that 47.0% of them were male and 53.0% were female. The majority (90.3%) of the review readers were white. Eighty two percent of the review readers were younger than 55, and around half of them were between 35 and 54. More than 80% of the review readers had at least a high school diploma, and more than 40% of them had at least a bachelor's degree. Half of the review readers had an annual household income between \$25,000 and \$74,999, and 11.2% of them had an income higher than \$125,000. As to the comparison between the review authors in Phase 1 and review readers in Phase 2, chi-square analysis showed that the review authors were significantly older, had significantly higher incomes, and were better educated than review readers (see Table 6.1). Chi-square analysis also showed that there were no significant differences on the distribution of gender and ethnicity between review authors and review readers.

Table 6.1 *Demographic Characteristics of the Respondents*

Characteristics	Sample Percentage (Senders, N=90)	Sample Percentage (Readers, N=134)	<i>Chi-Square (P)</i>
Gender			.74 (.39)
Male	41.1	47.0	
Female	58.9	53.0	
Age			9.30 (.16)
18 and younger	0	0	
18-24	3.3	11.2	
25-29	5.6	10.4	
30-34	10.0	13.4	
35-44	27.8	26.1	
45-54	26.7	20.9	
55-64	16.7	9.7	
65 and over	10.0	8.2	
Education			22.39 (.00)
Less than 5th grade	0	0	
5th to 8th grade	0	0	
9th to 12th grade, no diploma	1.1	2.3	
High school graduate	3.3	14.3	
Some college credit	17.8	27.8	
Associate degree	10.0	12.8	
Bachelor's degree	36.7	30.8	
Master's degree	34.4	6.8	
Professional	4.4	3.8	
Doctorate degree	2.2	1.5	
Annual Family Household Income			16.45 (.01)
Less than \$25,000	6.7	13.8	
\$25,000 to \$49,999	13.5	29.2	
\$50,000 to \$74,999	23.6	23.1	
\$75,000 to \$99,999	23.6	16.9	
\$100,000 to \$124,999	5.6	5.4	
\$125,000 to \$149,999	11.2	4.6	
More than \$150,000	15.7	6.9	
Ethnicity			3.97(.41)
Caucasian	81.1	90.3	
African-American	7.8	3.7	
Hispanic-American	4.4	2.2	
Asian-American	5.6	3.0	
Native American	0	0	
Other	1.1	.7	

Compared with the profile of general demographic characteristics in the United States (U.S. Census Bureau, 2000), all respondents in this study overrepresented young, white, and higher educated people. However, this sample bias is consistent with the demographics reported in Internet survey samples (e.g., Gosling, Vazire, Sirvastava and John, 2004) and online shopping research (e.g., Girard, Korgaonkar, and Silverblatt, 2003).

### **Communication Cues**

A comprehensive literature review and two focus group interviews were conducted to generate communication cues employed by eWOW partners in their eWOM communication. As a result, six content cues (food, service, environment, price, location, and reputation), six verbal cues (positive emotion words, negative emotion words, intensifiers, reducers, hedges, and indirect phrases), and four nonverbal cues (vocal spelling and lexical surrogate, emoticon, grammatical markers, and minus) were identified. These communication cues are called distal cues if they were used by eWOM authors and proximal cues if they were employed by eWOM readers.

Because each online review was rated by three to six readers in Phase 2 data collection, before conducting the data analysis, inter-rater reliabilities were evaluated to make sure the measures of proximal cues reported by review readers were reliable. Interclass correlations were employed to measure inter-rater reliabilities. The reliability across all proximal cues was high ( $r > .83$ ). However, the reliabilities of two proximal cues were relatively low; for example, the reliability of location was .39 and reputation was .47, and several cues had reliabilities around or lower than zero, such as hedge, vocal

spelling, emoticon, grammatical markers, and minus. These cues with low reliabilities were dropped from data analyses. The reliabilities for the proximal cues that were retained in the analyses were as following: food ( $r=.60$ ), service ( $r=.83$ ), environment ( $r=.68$ ), price ( $r=.84$ ), positive emotion words ( $r=.89$ ), negative emotion words ( $r=.92$ ), intensifiers ( $r=.68$ ), reducers ( $r=.79$ ), and indirect phrases ( $r=.63$ ). None of the nonverbal cues were found reliable. Figure 6.1 compares the mean usage rates of proximal cues and those of distal cues. Paired t-tests indicated that proximal cues were significantly different from distal cues on food ( $p<.001$ ), service ( $p<.001$ ), environment ( $p<.001$ ), price ( $p=.001$ ), positive emotion words ( $p=.001$ ), negative emotion words ( $p<.001$ ), reducers ( $p<.001$ ), and indirect phrases ( $p= .03$ ). Intensifiers was the only cue that was not significantly different between distal and proximal cues ( $p= .18$ ). The results indicated that compared to eWOM readers, eWOM senders' reported the more usage of all content cues and the verbal cue of positive emotion words. They also reported the use of fewer verbal cues of negative emotion words, reducers, and indirect phrases.

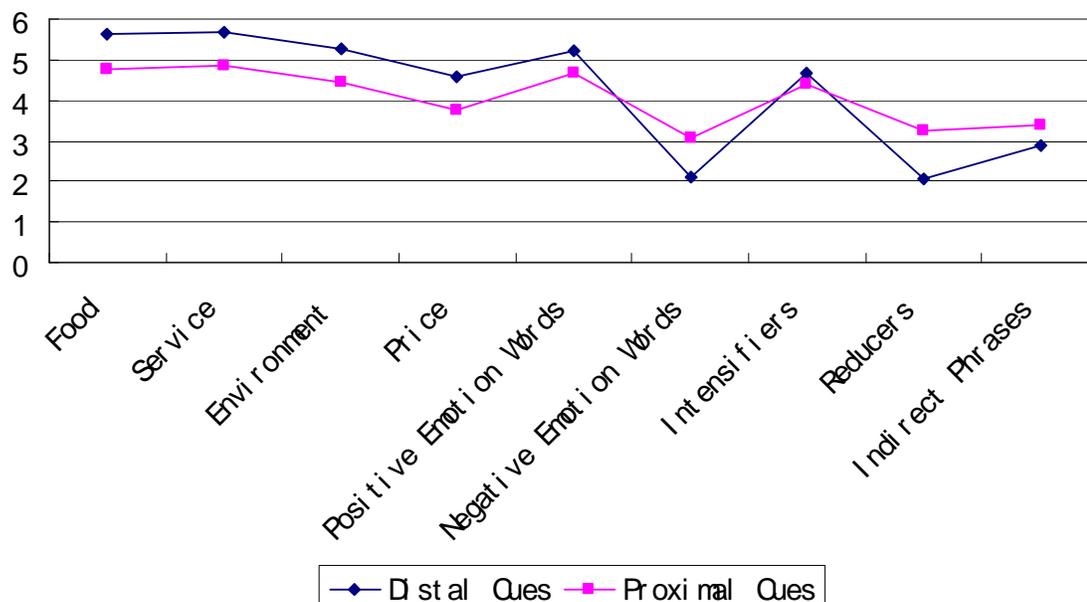


Figure 6.1. Description of proximal and distal cues

## Hypothesis Testing

### Test of Hypothesis 1

To test Hypothesis 1 (EWOM senders' attitudes and emotional states toward a product/service will predict their future patronage intentions toward the product/service), three simple regressions were conducted. In each regression, eWOM senders' future patronage intentions were regressed on their attitudes, overall positive emotions, and overall negative emotions toward the restaurants, respectively. Table 6.2 shows that all independent variables significantly predicted eWOM senders' future patronage intentions and explained more than 77% variance in their future patronage intentions. Thus, Hypothesis 1 was supported. Among the three independent variables, attitudes had the greatest predictive power ( $R^2=.86$ ), and overall negative emotions had the lowest

predictive utility ( $R^2=.69$ ). Furthermore, to compare the unique contribution of the independent variables, a stepwise multiple regression was employed. EWOM senders' attitudes, overall positive emotions, and overall negative emotions were introduced into the model as the independent variables simultaneously, and their future patronage intentions served as the dependent variable. Table 6.2 shows that attitudes and negative emotions made additional contribution to future patronage intentions, and together, they explained 87% variance in future patronage intentions. Attitudes were the stronger predictor of patronage intentions relative to overall negative emotions.

Table 6.2  
*Predictability of eWOM Senders' Attitudes and Emotional States on their Patronage Intentions*

Model	Independent Variable	Standardized $\beta$	$R^2$ (Adjusted $R^2$ )	$F$
1	Attitudes	.93***	.86 (.86)***	532.35***
2	Overall Positive Emotions	.91***	.83 (.83)***	435.16***
3	Overall Negative Emotions	-.88***	.77 (.77)***	300.77***
4	Attitudes Overall Positive Emotions Overall Negative Emotions	.71*** -.24*	.87 (.87)***	287.08***

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

### Test of Hypothesis 2

To test hypothesis 2 (EWOM senders' attitudes and emotional states toward a product/service will predict their communication intentions), three simple regressions were conducted. In each regression, eWOM senders' attitudes, overall positive emotions, and overall negative emotions served as the respective dependent variables, and subjects'

intended attitudes, intended overall positive emotions, and intended overall negative emotions were the respective independent variables. Table 6.3 shows that all the independent variables significantly predicted the corresponding communication intention and explained more than 69% of the variance in each dependent variable. Thus, Hypothesis 2 was supported. Regression results also showed that eWOM senders' attitudes had the highest predictive power ( $R^2=.91$ ), while overall negative emotions had the lowest predictive power ( $R^2=.69$ ).

Table 6.3  
*Predictability of eWOM Senders' Attitudes and Emotional States on their Communication Intentions*

Model	Independent Variable	Dependent Variable	Standardized $\beta$	$R^2$ (Adjusted $R^2$ )	$F$
1	Intended Attitudes	Attitudes	.95***	.91 (.91)***	886.00***
2	Intended Overall Positive Emotions	Positive Emotions	.94***	.88 (.88)***	669.69***
3	Intended Overall Negative Emotions	Negative Emotions	.83***	.69 (.69)***	196.53***

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

### Test of Hypothesis 3

To test Hypothesis 3, eWOM senders' communication intentions would be significantly correlated with distal cues, Pearson correlations between communication intentions and distal cues are presented in Table 6.4. The correlation results showed that all content cues were significantly correlated with eWOM senders' communication

intentions with the exception of price. Price did not show a significant correlation with overall negative emotions.

The correlation results also showed that all verbal cues, with the exception of intensifiers and indirect phrase, had significant correlations with communication intentions. Intensifiers and indirect phrases did not show significant correlations with any communication intentions. Thus, H3 was partially supported.

It appears that, as a group, the significant correlations among the communication intentions and distal content cues are weak to moderated correlations, ranging from .22 to .49. In contrast, the correlations among communication intentions and verbal cues associated with positive and negative emotion words are quite strong (rang from .61 to .93).

Table 6.4  
*Correlations between eWOM Senders' Communication Intentions and Distal Cues*

	Intended Attitudes	Intended Positive Emotions	Intended Negative Emotions
<b>A. Distal Content Cues</b>			
Food	.49 <sup>***</sup>	.49 <sup>***</sup>	-.37 <sup>***</sup>
Service	.31 <sup>**</sup>	.28 <sup>**</sup>	-.22 <sup>*</sup>
Environment	.44 <sup>***</sup>	.44 <sup>***</sup>	-.29 <sup>**</sup>
Price	.34 <sup>**</sup>	.31 <sup>**</sup>	-.15
<b>B. Distal Verbal Cues</b>			
Positive Emotion Words	.81 <sup>***</sup>	.80 <sup>***</sup>	-.61 <sup>***</sup>
Negative Emotion Words	-.92 <sup>***</sup>	-.93 <sup>***</sup>	.77 <sup>***</sup>
Intensifiers	-.02	-.02	-.02
Reducers	-.54 <sup>***</sup>	-.53 <sup>***</sup>	.45 <sup>***</sup>
Indirect Phrases	.01	.03	.04

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

#### Test of Hypothesis 4

To test Hypothesis 4A (Distal cues predict eWOM senders communication intentions), three stepwise multiple regressions were conducted. In the regressions,

eWOM senders' intended attitudes, intended overall positive emotions, and intended overall negative emotions served as the respective dependent variables. The independent variables in each regression were the distal cues that had significant correlations with the different communication intentions. Since these independent variables were redundant, as indicated by the significant correlations among them, stepwise multiple regressions were employed to identify the distal cues that made significant additional contributions toward predicting communication intentions. Table 6.5 shows that positive emotion words and negative emotion words significantly predicted and explained 87% variance in intended attitudes. Positive emotion words and negative emotion words significantly predicted and explained 88% variance in intended overall positive emotions. Negative emotion words significantly predicted and explained 59% variance in intended overall negative emotions. The distal cues that remained in the final stepwise regressions explained around the same amount of variance in communication intentions as explained by all distal cues that were significantly correlated with communication intentions. The communication cues that were significantly correlated with communication intentions explained 87% variance in intended attitude, 87% intended overall positive emotion, and 57% intended overall negative emotions respectively. Overall, H4A was supported. In addition, the verbal distal cues remained in the stepwise regressions explained substantially more variance in intended attitudes and intended positive emotions than in intended negative emotions. Also, negative emotion words were the stronger predictors of communication intentions relative to positive emotion words.

Table 6.5  
*Multiple Regressions of Distal Cues on eWOM Senders' Communication Intentions*

Independent Variable	Intended Attitudes		Intended Positive Emotions		Intended Negative Emotions	
	Standardized $\beta$	$R^2$ (Adjusted $R^2$ )	Standardized $\beta$	$R^2$ (Adjusted $R^2$ )	Standardized $\beta$	$R^2$ (Adjusted $R^2$ )
Positive Emotion Words	.24***	.87(.87)	.20**	.88(.88)***		
Negative Emotion Words	-.74***		-.77***		.77***	.59(.59)***

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

To test Hypothesis 4B (Distal cues explain additional variance in communication intentions beyond and above the star ratings), three stepwise multiple regressions were employed. Intended attitudes, intended overall positive emotions, and intended overall negative emotions served as the dependent variable for each respective regression. Star ratings were introduced into the regression model at the first step. Then, all the distal cues that were significantly correlated with communication intentions were input into the model as the second step. Stepwise multiple regressions were used to identify the distal cues that can explain additional variance in eWOM senders' communication intentions beyond and above the star ratings.

Table 6.6 showed that star ratings were still important predictors of intended attitudes, intended overall positive emotions, and intended overall negative emotions even after introducing distal cues. Also distal cues explained a significant amount of additional variance in communication intentions beyond and above the star ratings. Specifically, negative emotion words contributed additional explanatory power to intended attitudes, intended positive emotions, and intended negative emotions. Positive emotion words contributed to both intended attitudes and intended positive emotions. Thus, H4B was

supported. In addition, the verbal distal and with star ratings remained in the stepwise regressions explained substantially more variance in intended attitudes and positive emotions than in intended negative emotions. Negative emotion words were the stronger predictors of communication intentions relative to positive emotion words and star ratings.

Table 6.6  
*Multiple Regressions of Star Ratings and Distal Cues on eWOM Senders' Communication Intentions*

Independent Variable	Intended Attitudes			Intended Positive Emotions			Intended Negative Emotions		
	Std. $\beta$	$R^2$ (Adj. $R^2$ )	$\Delta R^2$ (Adj. $\Delta R^2$ )	Std. $\beta$	$R^2$ (Adj. $R^2$ )	$\Delta R^2$ (Adj. $\Delta R^2$ )	Std. $\beta$	$R^2$ (Adj. $R^2$ )	$\Delta R^2$ (Adj. $\Delta R^2$ )
Model 1									
Star Ratings	.88** *	.77 (.77)		.86***	.74 (.74) ***		-.70***	.48 (.48) ***	
Model 2									
Star Ratings	.35** *	.91 (.91)	.14 (.14) ***	.29***	.91 (.90) ***	.17 (.16) ***	-.22* *	.61 (.60) ***	.19 (.17) ***
Positive Emotion Words	.18** *			.15**					
Negative Emotion Words	-.51** **			-.58** *			.59***		

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

### Test of Hypothesis 5

To test Hypothesis 5 (the proximal cues detected by eWOM readers are significantly correlated with the distal cues encoded by eWOM senders), Pearson correlations were employed. Higher correlations indicated a greater probability that the encoded information by eWOM senders was successfully detected by eWOM receivers. Table 6.7 shows that proximal content cues were significantly correlated with their corresponding distal content cues on service, environment, and price. However, the correlation between

the corresponding cues on food was not significant. For verbal cues (see Table 6.8), the correlations between distal verbal cues and corresponding proximal verbal cues on positive emotion words, negative emotion words, intensifiers, and reducers were significant. However, the distal cue and proximal cues on indirect phrases were not significantly correlated ( $r=.17$ ). Thus, Hypothesis 5 was partially supported.

It appears that the significant correlations among distal cues and proximal cues are weak correlations (ranging from .21 to .29) with three exceptions. The significant correlations between distal cues and the corresponding proximal cues associated with positive and negative emotion words are quite strong ( $r= .59$  to  $.80$  respectively). The correlation between the distal cue and the corresponding proximal cue associated with the environment was moderate ( $r =.31$ ).

Table 6.7

*Correlations among eWOM Senders' Distal Content Cues and eWOM Readers' Proximal Content Cues*

	1	2	3	4	7	8	9	10
1. Food (Sender)	1.00							
2. Service (Sender)	.52***	1.00						
3. Environment (Sender)	.44***	.37***	1.00					
4. Price (Sender)	.54***	.39***	.47***	1.00				
7. Food (Reader)	<b>-.02</b>	-.18	.11	-.07	1.00			
8. Service (Reader)	.14	<b>.29**</b>	.18	.11	.24*	1.00		
9. Environment (Reader)	.01	-.08	<b>.31**</b>	-.01	.60***	.40***	1.00	
10. Price (Reader)	.02	-.01	.12	<b>.23*</b>	.42***	.31**	.41***	1.00

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

Table 6.8  
*Correlations among eWOM Senders' Distal Verbal Cues and eWOM Readers' Proximal Verbal Cues*

	1	2	3	4	5	6	7	8	9	10
1. Positive Emotion Words (Sender)	1.00									
2. Negative Emotion Words (Sender)	-.78** *	1.00								
3. Intensifiers (Sender)	.16	.02	1.00							
4. Reducers (Sender)	-.49** *	.59***	.06	1.00						
5. Indirect Phrase (Sender)	.17	.04	.25*	.08	1.00					
6. Positive Emotion Words (Reader)	.59***	-.69** *	.01***	-.40** *	.06	1.00				
7. Negative Emotion Words (Reader)	-.70** *	.80***	-.06	.48***	.11	-.58** *	1.00			
8. Intensifiers (Reader)	-.08	.16	.21*	.18	.14	.24*	.30**	1.00		
9. Reducers (Rader)	-.47** *	.48***	.13	.29**	.14	-.32**	.68***	.30**	1.00	
10. Indirect Phrase (Reader)	-.27** *	.29**	.07	.22*	.17	-.17	.50***	.43***	.41***	1.00

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

### Test of Hypothesis 6

To test Hypothesis 6 (EWOM senders' communication intentions perceived by eWOM receivers are significantly correlated with the proximal cues detected by the eWOM receivers), Pearson correlations were employed (see Table 6.9). Higher correlations indicated that proximal cues played a greater role in eWOM readers' perception. For the content cues, food, service, and environment were positively associated with perceived attitudes. Service and environment were positively associated with perceived positive emotions. The significant correlations between perceived communication intentions and proximal content cues were weak, ranging from .22 to .24.

Table 6.9  
*Correlations between eWOM Senders' Perceived Communication Intentions and eWOM Readers' Proximal Cues*

	Perceived Positive Emotions	Perceived Negative Emotions	Perceived Attitudes
<b>A. Content Cues</b>			
Food	.19	-.12	.22*
Service	.23*	-.17	.24*
Environment	.22*	-.14	.23*
Price	.17	-.06	.16
<b>B. Verbal Cues</b>			
Positive Emotion Words	.79***	-.71***	.77***
Negative Emotion Words	-.79***	.89***	-.81***
Intensifier	-.02	.08	-.06
Reducer	-.52***	.61***	-.52***
Indirect Phrases	-.25*	.41***	-.27*

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

All verbal cues with the exception of intensifiers were significantly correlated with perceived attitudes and perceived emotions. Intensifiers did not show any significant correlation with perceived attitudes or emotions. The significant correlations between the proximal verbal cues of positive emotion words, negative emotion words, and reducers and perceived communication intentions were moderate to quite strong (ranging from .52 to .89). The significant correlations between the proximal verbal cues of indirect phrases and perceived communication intentions were weak to moderate (ranging from .25 to .41). Thus, H6 was partially supported.

### **Test of Hypothesis 7**

To test Hypothesis 7A (eWOM readers' proximal cues will predict their perceived communication intentions), three multiple regressions were conducted. In the regressions, the reliable proximal cues that were significantly correlated with perceived communication intentions were regressed on eWOM readers' perceived attitudes,

perceived overall positive and negative emotions respectively. The stepwise procedure was used because the independent variables were redundant as indicated by the significant correlations among them. Stepwise multiple regressions were employed to identify the proximal cues that made significant additional contribution in predicting perceived communication intentions. Table 6.10 shows that positive emotion words, negative emotion words, and service significantly predicted and explained 80% variance in eWOM readers' perceived attitudes. Positive emotion words, negative emotion words, and indirect phrase significantly predicted and explained 79% variance in eWOM readers' perceived positive emotions. Positive emotion words and negative emotion words significantly predicted and explained 85% variance in eWOM readers' perceived negative emotions. The proximal cues remaining in the final regressions explained around the same amount variance in eWOM readers' perceived attitudes and emotions as explained by all proximal cues that were significantly correlated with perceived communication intentions. Thus, Hypothesis 7A was supported. In addition, the verbal cues of emotion words were the two strongest predictors of perceived communication intentions.

Table 6.10  
*Multiple Regressions of Proximal Cues on Perceived Communication Intentions*

Independent Variable	Perceived Attitudes		Perceived Positive Emotions		Perceived Negative Emotions	
	Standardized $\beta$	$R^2$ (Adjusted $R^2$ )	Standardized $\beta$	$R^2$ (Adjusted $R^2$ )	Standardized $\beta$	$R^2$ (Adjusted $R^2$ )
Positive Emotion Words	.42***	.80(.80)	.47***	.80(.79)***	-.30***	.85(.85)***
Negative Emotion Words	-.56***		-.58***		.72***	
Service Indirect Phrases	.12*		.12*			

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

To test Hypothesis 7B (eWOM readers' proximal cues explain additional variance in their perceived communication intentions beyond and above the star ratings), three stepwise regressions were employed (see Table 6.11). EWOM readers' perceived attitudes, perceived overall positive emotions, and perceived overall negative emotions served as the dependent variable for each regression. Star ratings were entered first into each model. Star ratings significantly predicted perceived attitudes, perceived overall positive emotions, perceived overall negative emotions, and explained 57%, 54%, and 59% variance in the three dependent variables, respectively. In the second step, all proximal cues that were significantly correlated with the corresponding perceived communication intentions were introduced into the each model. The results of stepwise regressions showed that star ratings were still an important predictor of perceived attitudes, perceived overall positive emotions, and perceived overall negative emotions after introducing proximal cues into the models. Table 6.11 shows that proximal cues explained significant additional variance in perceived attitudes and perceived emotions

beyond and above star ratings as indicated by significant increases in  $R^2$ . Specifically, positive emotion words, negative emotion words, and service made additional contribution to perceived attitudes. Positive emotion words and negative emotion words contributed to perceived overall positive emotions beyond and above star ratings. Finally, positive emotion words and negative emotion words made significant additional contribution to perceived overall negative emotions beyond and above star ratings. Thus H7b was supported. In addition, verbal proximal cues of emotion words along with star ratings remained in all the stepwise regressions. Negative emotion words were the strongest predictors of perceived attitudes and negative emotions, and positive emotion words were the strongest predictors of perceived positive emotions.

Table 6.11  
*Multiple Regressions of Star Ratings and Readers' Proximal Cues on their Perceived Communication Intentions*

Independent Variable	Perceived Attitudes			Perceived Positive Emotions			Perceived Negative Emotions		
	Std. $\beta$	$R^2$ (Adj. $R^2$ )	$\Delta R^2$ (Adj. $\Delta R^2$ )	Std. $\beta$	$R^2$ (Adj. $R^2$ )	$\Delta R^2$ (Adj. $\Delta R^2$ )	Std. $\beta$	$R^2$ (Adj. $R^2$ )	$\Delta R^2$ (Adj. $\Delta R^2$ )
Model 1									
Star Ratings	.76** *	.57 (.57)		.74***	.55 (.54)		-.77***	.59 (.59)	
Model 2									
Star Ratings	.24** *	.83 (.83)	.26 (.26) ***	.23***	.81 (.81) ***	.26 (.27) ***	-.23***	.88 (.88) ***	.29 (.29) ***
Positive Emotion Words	.35** *			.42***			-.23***		
Negative Emotion Words	-.44**			-.40** *			.60***		
Service	.10*								

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

### Test of Hypothesis 8

To test Hypothesis 8 (EWOM readers' perceptions of eWOM senders' communication intentions predict their own attitudes and emotional states toward a product/service), three simple regressions were conducted to examine the predictability of perceived attitudes, overall positive emotions, and overall negative emotions on their own corresponding attitudes and emotions. Table 6.12 shows that eWOM readers' perceived attitudes significantly predicted and explained 82% variance in their own attitudes. EWOM readers' perceived overall positive emotions significantly predicted and explained 75% variance in their own positive emotions toward the focused restaurant. EWOM readers' perceived overall negative emotions significantly predicted and explained 79% variance in their own negative emotions toward the focused restaurants. Thus, H8 was supported.

Table 6.12  
*Regressions of eWOM Readers' Perceived Communication Intention on their Attitudes and Emotional States*

Model	Independent Variable	Dependent Variable	Standardized $\beta$	$R^2$ (Adjusted $R^2$ )	$F$
1	Perceived Attitudes	Attitudes	.91 <sup>***</sup>	.82 (.82) <sup>***</sup>	396.50 <sup>***</sup>
2	Perceived Positive Emotions	Positive Emotions	.87 <sup>***</sup>	.75 (.75) <sup>***</sup>	266.06 <sup>***</sup>
3	Perceived Negative Emotion	Negative Emotions	.89 <sup>***</sup>	.79 (.79) <sup>***</sup>	333.47 <sup>***</sup>

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

### Test of Hypothesis 9

To test Hypothesis 9 (EWOM readers' attitudes and emotional states toward a product/service will significantly predict their future patronage intentions toward the

product/service), three simple regressions were conducted to examine the predictability of attitudes, overall positive emotions, and overall negative emotions on patronage intentions respectively. Table 6.13 shows that each independent variable significantly predicted and explained at least half of the variance in eWOM readers' patronage intentions. Thus, H9 was supported. Furthermore, a stepwise multiple regression was conducted to identify the variables that made additional contributions to patronage intentions. Table 6.13 shows that attitudes and overall positive emotions toward the focused restaurant significantly predicted eWOM readers' future patronage intentions. These two variables together explained 83% variance in eWOM readers' patronage intentions. In addition, overall positive emotions were the stronger predictors of patronage intentions relative to attitudes.

Table 6.13  
*Regressions of eWOM Readers' Attitudes and Emotions on their Patronage Intentions*

Model	Independent variable	Standardized $\beta$	$R^2$ (Adjusted $R^2$ )	$F$
1	Attitudes	.89 <sup>***</sup>	.80 (.80) <sup>***</sup>	347.83 <sup>***</sup>
2	Overall Positive Emotions	.91 <sup>***</sup>	.82 (.82) <sup>***</sup>	413.06 <sup>***</sup>
3	Overall Negative Emotion	-.74 <sup>***</sup>	.55 (.54) <sup>***</sup>	105.22 <sup>***</sup>
4	Attitudes	.32 <sup>*</sup>	.83 (.83) <sup>***</sup>	218.77 <sup>***</sup>
	Overall Positive Emotions	.61 <sup>***</sup>		
	Overall Negative Emotions			

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

### Test of Hypothesis 10

To test Hypothesis 10 (EWOM senders' self-reported communication intentions are significantly correlated with communication intentions perceived by eWOM readers),

Pearson correlations between eWOM senders' communication intentions and eWOM receivers' perceived communication intentions were conducted. The associations, called achievement in Brunswik's Lens Model, provided an indicator of the effectiveness of eWOM communication process. Table 6.14 shows that eWOM senders' self-reported communication intentions were significantly correlated with communication intentions perceived by eWOM readers. All these correlations were quite strong, ranging from .67 to .84. Thus, H10 was supported.

Table 6.14  
*Correlations between Senders' Communication Intentions and Readers' Perceived Communication Intentions*

	1	2	3	4	5	6
1. Intended Attitudes	1.00					
2. Perceived Attitudes	.84***	1.00				
3. Intended Positive Emotions	.97***	.86***	1.00			
4. Perceived Positive Emotions	.81***	.97***	.83***	1.00		
5. Intended Negative Emotions	-.78***	-.69***	-.79***	-.65***	1.00	
6. Perceived Negative Emotions	-.84***	-.92***	-.85***	-.90***	.67***	1.00

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

### Test of Hypothesis 11

To test Hypotheses 11A and 11B (The linguistic indicators associated with positive emotions and negative emotions will be significantly associated with distal and proximal cues of positive emotion words and negative emotion words.), Pearson correlations among linguistic indicators, distal cues, and proximal cues were conducted.

It is expected that the linguistic indicators associated with negative emotions such as Negations, Negative Emotions, Anger, and First Person Pronouns should be positively correlated with the distal cue of negative emotion words and may be negatively correlated with the distal cue of positive emotion words. The linguistic indicators

associated positive emotions such as Positive Feelings, Positive Emotions, and Optimism and Energy should be positively correlated with the distal cue of positive emotion words and may be negatively correlated with the distal cue of negative emotion words. Table 6.15 provides some evidence for above hypothesized correlations. For example, the distal cues of positive emotion words were significantly correlated with Negations, Positive Emotions, and Negative Emotions. The distal cue of negative emotion words were significantly correlated with First Person Singular Pronouns, Total First Person Pronouns, Negations, Positive Emotions, Optimism and Energy, Negative Emotions, and Anger. All significant correlations among the linguistic indicators and distal linguistic cues were weak to moderate correlations, ranging from .22 to .54. However, the linguistic indicator of Positive Feeling did not show any significant correlations with the distal cues of emotion words. Thus, H11A was supported with the exception of Positive Feeling.

Table 6.15  
*Correlations between LIWC Linguistic Indicators and eWOM Senders' Distal Linguistic Cues*

Linguistic Cues	Positive Emotion Words	Negative Emotion Words
Word Count	-.05	.16
1 <sup>st</sup> Person Singular	-.20	.24*
1 <sup>st</sup> Person Plural	.04	.11
Total First Person	-.13	.27*
Total Second Person	.16	-.30**
Total Third Person	-.01	.01
Negations	-.35**	.47***
Assent	.05	.13
Positive Emotions	.31**	-.35**
Positive Feeling	.20	-.17
Optimism and Energy	.16	-.28**
Negative Emotions	-.45***	.54***
Anxiety or Fear	-.09	.12
Anger	-.19	.29**
Sadness and Depression	-.22*	.21*
Cognitive Process	-.12	.15
Causation	-.03	.07
Insight	-.05	.02
Discrepancy	-.11	.15
Inhibition	.05	-.08
Tentative	-.10	.20
Certainty	.18	-.02
Period	-.03	-.01
Comma	-.02	-.20
Colon	.08	-.02
Semicolon	.07	.01
Question Mark	-.13	.17
Exclamation Mark	-.09	.13
Dash	-.02	-.09
Quote	-.03	.15
Apostrophe	-.01	.04
Parenthesis	-.13	.19
Other Punctuations	.05	-.16
All Punctuations	-.06	-.08

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

It is expected that the linguistic indicators associated with negative emotions such as Negations, Negative Emotions, Anger, and First Person Pronouns should be positively correlated with the proximal cue of negative emotion words and may be negatively

correlated with the proximal cue of positive emotion words. The linguistic indicators associated positive emotions such as Positive Feelings, Positive Emotions, and Optimism and Energy should be positively correlated with the proximal cue of positive emotion words and may be negatively correlated with the proximal cue of negative emotion words. Table 6.16 provides some evidence for above hypothesized correlations. For example, the proximal cue of positive emotion words was significantly correlated with Negations, Positive Emotions, Optimism and Energy, and Negative Emotions. The proximal cues of negative emotion words was significantly correlated with First Person Singular Pronouns, Negations, Positive Emotions, Negative Emotions, and Anger. All significant correlations among the linguistic indicators and distal linguistic cues were weak to moderate correlations, ranging from .23 to .55. However, the linguistic indicator of Positive Feeling did not show any significant correlations with the proximal cues of emotion words. Thus, Hypothesis 11B was supported with the exception of Positive Feeling.

Table 6.16  
*Correlations between LIWC Linguistic Indicators and eWOM Readers' Proximal Linguistic Cues*

Linguistic Cues	Positive Emotion Words	Negative Emotion Words
Word Count	.09	.09
1 <sup>st</sup> Person Singular	-.20	.26*
1 <sup>st</sup> Person Plural	.01	-.03
Total First Person	-.15	.19
Total Second Person	.12	-.27**
Total Third Person	-.07	.01
Negations	-.32**	.55***
Positive Emotions	.32**	-.28**
Positive Feeling	.20	-.09
Optimism and Energy	.22*	-.20
Negative Emotions	-.36***	.44***
Anxiety or Fear	-.02	-.04
Anger	-.14	.25*
Sadness and Depression	-.14	.18
Cognitive Process	-.06	.16
Tentative	-.05	.17
Certainty	-.01	-.02
Period	-.02	.03
Comma	.13	-.12
Colon	.15	-.03
Semicolon	.04	.00
Question Mark	-.08	.05
Exclamation Mark	-.06	.18
Dash	.11	-.06
Quote	.02	.19
Parenthesis	-.14	.20
Apostrophe	.11	.16
Other Punctuation	.05	-.14
Total Punctuation	.09	.02

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

### Test of Hypothesis 12

To test hypothesis 12 (Linguistic indicators associated with positive or negative emotions are significantly correlated with eWOM senders' self-reported attitudes, evaluations, and emotional states toward a product/service), Pearson correlations between

linguistic indicators and eWOM senders' explicit attitudes, overall evaluations, and emotional states were conducted.

It is expected that the linguistic indicators associated with negative emotions such as Negations, Negative Emotions, Anger, and First Person Pronouns should be positively correlated with eWOM senders' self-reported negative emotions and may be negatively correlated with their self-reported positive emotions, attitudes, and overall evaluations. The linguistic indicators associated positive emotions such as Positive Feelings, Positive Emotions, and Optimism and Energy should be positively correlated with eWOM senders' self-reported positive emotions, attitudes, and overall evaluations and may be negatively correlated with their self-reported negative emotions. Table 6.17 provides some evidence for above hypothesized correlations. For example, the linguistic indicators of Positive Emotions, Positive Feelings and Optimism and Energy were positively related to eWOM senders' self-reported attitudes, overall evaluations, and positive emotions, and negatively related to eWOM senders' self-reported negative emotions. The correlation results also showed that the linguistic indicators of Negative Emotions, Negations, and Anger were positively correlated with eWOM senders' self-reported overall negative emotions and negatively correlated with eWOM senders' self-reported overall positive emotions, attitudes, and overall evaluations. The significant correlations among Negations, Positive Emotions and Negative Emotions and eWOM senders' attitudes, overall emotions and overall evaluation were moderate correlations (ranging from .31 to .53). The significant correlations among Positive Feeling, Optimism and Energy, and

Anger and eWOM senders' attitudes, overall emotions, and overall evaluation were weak to moderate correlations (ranging from .21 to .35).

Table 6.17  
*Correlations between eWOM Senders' Attitudes, Emotions, Star Ratings, and Linguistic Indicators*

Linguistic Cues	Attitude	Star Rating	Positive Emotion	Negative Emotion	Patronage Intention
<b>Linguistic Indicators</b>					
Word Count	.12	-.13	-.12	-.12	-.12
1 <sup>st</sup> Person Singular	-.27*	-.20	-.30**	.25*	-.20
1 <sup>st</sup> Person Plural	-.03	.05	-.06	.04	-.05
Total First Person	-.24*	-.13	-.28**	.22	-.20
Total Second Person	.22*	.08	.20	-.18	.25*
Total Third Person	.04	.02	-.01	.02	-.04
Negations	-.48***	-.41***	-.49***	.44***	-.47***
Positive Emotions	.35**	.36***	.39***	-.31**	.31**
Positive Feeling	.13	.12	.17	-.21*	.11
Optimism and Energy	.28**	.21	.26*	-.27**	.27*
Negative Emotions	-.51***	-.47***	-.53***	.46***	-.51***
Anxiety or Fear	-.05	.01	-.08	.09	-.01
Anger	-.35**	-.31**	-.33**	.29**	-.28**
Sadness and Depression	-.12	-.07	-.15	.10	-.20
Cognitive Process	-.15	-.13	-.17	.18	-.08
Tentative	-.17	-.07	-.18	.18	-.22*
Certainty	.05	.03	.03	-.01	.07
Money	-.36***	-.26*	-.37***	.34***	-.34***
Period	-.02	.13	.02	-.05	.01
Comma	.16	.16	.17	-.18	.14
Colon	.05	.04	.07	.12	.05
Semicolon	.00	-.09	-.04	.03	.00
Question mark	-.04	.04	-.09	.09	-.06
Exclamation Mark	-.15	-.15	-.17	.09	-.10
Dash	.01	-.04	.02	-.04	.05
Quote	-.08	-.08	-.09	.08	.00
Parenthesis	-.29**	-.23*	-.27**	.21*	.00
Apostrophe	-.02	-.03	.02	.00	-.25*
Other Punctuations	.13	.14	.15	-.16	.15
All Punctuations	.03	.10	.06	-.10	.07

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

It is also expected that the linguistic indicators associated with negative emotions such as Negations, Negative Emotions, Anger, and First Person Pronouns should be positively correlated with eWOM senders' discrete negative emotions (e.g., anger and sad) and may be negatively correlated with their self-reported discrete positive emotions (e.g.,

happy and satisfied etc.). The linguistic indicators associated positive emotions such as Positive Feelings, Positive Emotions, and Optimism and Energy should be positively correlated with eWOM senders' self-reported discrete positive emotions and may be negatively correlated with their self-reported discrete negative emotions. Table 6.18 provides some evidence for above hypothesized correlations. The linguistic indicators including Positive Emotions, Positive Feelings and Optimism, and Energy were positively associated with eWOM senders' self-reported discrete positive emotions, and negatively associated with eWOM senders' self-reported discrete negative emotions in general. Above significant correlations were weak to moderate correlations (ranging from .22 to .40). As expected, LIWC indicators associated negative emotions including Negations, Negative Emotions, and Anger were positively correlated eWOM senders' self-reported discrete negative emotions and negatively correlated with eWOM senders' self-reported discrete positive emotions. Above significant correlations were also weak to moderate (ranging from .24 to .51).

Above all, linguistic indicators associated with positive emotions showed significant positive correlations with eWOM senders' self-reported overall evaluations, attitudes, overall positive emotions, and discrete positive emotions, and significant negative correlations with their self-reported overall and discrete negative emotions. Linguistic indicators associated with negative emotions showed significant negative correlations with eWOM senders' self-reported overall evaluations, attitudes, overall positive emotions, and discrete positive emotions, and significant positive correlations with their self-reported overall and discrete negative emotions. Thus, H12 was supported.

Table 6.18  
*Correlations between eWOM Senders' Discrete Emotions and Linguistic Indicators*

	Happy	Delighted	Satisfied	Excited	Mad	Angry	Irritated	Frustrated	Depressing	Disappointed	Sad
Word Count	-.11	-.13	-.14	-.14	.09	.11	.09	.11	-.08	.06	-.08
1 <sup>st</sup> Person Singular	-.29**	-.29**	-.28**	-.24**	.18	.15	.20	.22*	.11	.22*	.09
1 <sup>st</sup> Person Plural	.00	-.06	-.05	.01	.05	.05	.02	.01	.03	.03	.08
Total First Person	-.23*	-.28**	-.25*	-.20	.18	.16	.17	.19	.11	.19	.13
Total Second Person	.19	.23*	.23*	.22*	-.19	-.19	-.17	-.19	-.09	-.17	-.11
Total Third Person	-.00	.04	.04	-.02	-.02	-.01	.02	.01	-.03	-.01	-.02
Negations	-.49***	-.49***	-.46***	-.47***	.43** *	.44***	.42***	.45***	.33***	.46***	.36** *
Positive Emotions	.40***	.38***	.33**	.36***	-.31* *	-.27*	-.28**	-.26*	-.12	-.32**	-.14
Positive Feeling	.16	.14	.13	.19	-.19	-.17	-.18	-.16	-.13	-.21*	-.15
Optimism and Energy	.25*	.24*	.24*	.19	-.22*	-.23*	-.20	-.24*	-.15	-.23*	-.19
Negative Emotions	-.51***	-.50***	-.51***	-.43***	.49** *	.48***	.50***	.48***	.20	.49***	.27**
Anxiety or Fear	.05	.02	-.05	.05	.17	.15	.10	.10	.19	.21*	.22*
Anger	-.30**	-.32**	-.29**	-.24*	.31**	.31**	.31**	.32**	.07	.24*	.13
Sadness and Depression	-.16	-.12	-.16	-.12	.12	.08	.12	.13	.06	.17	.10

Table 6.18

*Correlation between eWOM Senders' Discrete Emotions and LIWC Linguistic Indicators (Continued)*

	Happy	Delighted	Satisfied	Excited	Mad	Angry	Irritated	Frustrated	Depressing	Disappointed	Sad
Cognitive Process	-.19	-.14	-.12	-.07	.08	.09	.11	.14	.07	.15	.09
Tentative	-.14	-.13	-.21*	-.21*	.15	.15	.15	.14	.07	.19	.16
Certainty	.08	.05	.05	.10	.00	.02	-.03	-.03	.04	-.01	.07
Money	-.39***	-.37***	-.35***	-.41***	.32**	.35***	.35***	.36***	.22*	.36***	.31**
Period	.11	.10	-.03	-.06	.00	.00	-.03	-.02	.11	-.03	.10
Comma	.17	.20	.15	.15	-.18	-.18	-.18	-.15	-.15	-.16	-.22*
Colon	.04	.06	.03	.06	-.03	-.02	-.01	-.01	-.01	-.03	.01
Semicolon	-.12	-.11	-.15	-.11	.06	-.01	.12	.09	-.10	.07	.07
Question mark	-.12	-.11	-.15	-.11	.06	-.01	.12	.09	-.10	.07	.07
Exclamation Mark	-.15	-.19	-.17	-.21*	.10	.05	.09	.08	.00	.11	-.03
Dash	.08	.08	.05	.06	-.04	-.04	-.05	-.03	-.01	-.01	-.03
Quote	-.10	-.12	-.10	-.11	.07	.02	.10	.12	.04	.11	.02
Parenthesis	-.25*	-.29**	-.23*	-.27*	.17	.17	.21	.20	.03	.17	.03
Apostrophe	.00	-.01	-.03	.01	.00	-.01	.00	.02	.03	.04	.03
Other	.15	.13	.13	.05	-.17	-.17	-.18	-.19	-.14	-.18	-.16
Punctuation											
All Punctuation	.06	.06	.10	-.02	-.08	-.10	-.09	-.07	-.03	-.07	-.08

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

### **Test of Hypothesis 13**

To test hypothesis 13A (Linguistic indicators predict eWOM senders' self-reported overall evaluations, attitudes, and emotions toward a product/service), four multiple regressions were conducted. EWOM senders' self-report attitudes, overall evaluations, overall positive emotions, and overall negative emotions toward the focused restaurants served as the dependent variables in each regression, respectively. The LIWC indicators that had significant correlations with the respective eWOM senders' attitudes, evaluations and emotions served as the independent variables. Since the independent variables were redundant as indicated by the significant correlations among them, stepwise multiple regressions were employed to identify the linguistic indicators that made significant additional contributions in predicting eWOM senders' attitudes, overall evaluations, and emotional states toward the focused restaurants. Table 6.19 shows that Negative Emotions, Negations, Money, and Optimism and Energy, Parenthesis, and Second Person Pronouns significantly predicted and explained 52% variance in self-reported attitudes. Negative Emotions, Negations, and Positive Emotions significantly predicted and explained 34% variance in eWOM senders' overall evaluations. Negative Emotions, Negations, Money, First Person Singular, and Positive Emotions predicted and explained 54% variance in eWOM senders' self-reported positive emotions. Negative Emotion, Negations, Money, and Optimism and Energy significantly predicted and explained 41% variance in eWOM senders' self-reported negative emotions. Furthermore, the results showed the linguistic indicators remaining in the stepwise multiple regressions explained around the same amount variance of eWOM senders' evaluations, attitudes, and

emotional states as explained by all linguistic indicators that were significantly correlated with eWOM senders' attitudes, overall evaluations, and emotional states toward the focused restaurant. The linguistic indicators that were significantly correlated with eWOM senders' attitudes, overall evaluations, and emotional states toward the focused restaurant explained 50% variance in self-reported attitudes, 35% in overall evaluations, 54% in overall positive emotions, and 43% in overall negative emotions respectively. Thus, H13A was supported. In addition, the interesting information is that linguistic indicators explained substantially more variance in attitudes and positive emotions than in negative emotions and overall evaluations. Regression results also indicated that Negations and Negative Emotions remained in all regressions and were the two strongest predictors of eWOM senders' self-reported attitudes, emotional states, and evaluations.

Table 6.19  
*Multiple Regressions of Linguistic Indicators on eWOM Senders' Attitudes, Star Ratings, and Emotional States*

Independent variable	Attitudes		Overall Evaluations		Overall Positive Emotions		Overall Negative Emotions	
	Std. $\beta$	$R^2$ (Adj. $R^2$ )	Std. $\beta$	$R^2$ (Adj. $R^2$ )	Std. $\beta$	$R^2$ (Adj. $R^2$ )	Std. $\beta$	$R^2$ (Adj. $R^2$ )
Negative Emotions	-.34***	.56(.52) ***	-.32***	.36(.34) ***	-.34***	.56(.54) ***	.33***	.43(.41) ***
Negations	-.30***		-.31**		-.34***		.33***	
Money	-.28***				-.27***		.23**	
Optimism and Energy	.19*						-.20*	
Second Person Pronouns	.18*							
Paraphrasing	-.17*							
Total First Person Pronouns	-				-.17*			
Positive Emotions			.23*		.17*			

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

Furthermore, to test H13B (Linguistic indicators explain additional variance in eWOM senders' attitudes, overall evaluations, and emotional states toward a product/service beyond and above the star ratings), four stepwise multiple regressions were conducted. EWOM senders' self-reported attitudes, overall evaluations, overall positive emotions, and overall negative emotions toward the focused restaurant served as the dependent variable in each regression respectively. Star ratings were introduced into the regression models at the first step. Then, all the LIWC indicators that were significantly correlated with respective eWOM senders' attitudes, evaluations and emotional states were input into the models in the next step. Stepwise multiple regressions were used to identify the linguistic indicators that explained additional variance in eWOM senders' self-reported attitudes, overall evaluations, and emotional states toward the focused restaurant beyond and above the star ratings. Table 6.20 shows that star ratings were important predictors of eWOM senders' attitudes, overall evaluations, overall positive emotions, and overall negative emotions even after introducing the linguistic indicators, and linguistic indicators explained significant additional variance beyond and above the star ratings as indicated by significant increases in  $R^2$ . Thus, H13b was supported. Furthermore, regression results indicated that linguistic indicators explained the least additional variance in overall evaluations and the most in overall positive emotions. Negations, Money, Negative Emotions, Positive Feelings, Pronouns, and Parenthesis contributed additional explanatory power in eWOM senders' attitudes, overall evaluations, and emotional states.

Table 6.20  
*Multiple Regressions of Star Ratings and Linguistic Indicators on eWOM Senders' Attitudes, Star Ratings, and Emotional States*

Independent variable	Attitudes			Overall Evaluations			Overall Positive Emotions			Overall Negative Emotions		
	Std. $\beta$	$R^2$ (Adj. $R^2$ )	$\Delta R^2$ (Adj. $\Delta R^2$ )	Std. $\beta$	$R^2$ (Adj. $R^2$ )	$\Delta R^2$ (Adj. $\Delta R^2$ )	Std. $\beta$	$R^2$ (Adj. $R^2$ )	$\Delta R^2$ (Adj. $\Delta R^2$ )	Std. $\beta$	$R^2$ (Adj. $R^2$ )	$\Delta R^2$ (Adj. $\Delta R^2$ )
Model 1												
Star Ratings	.85***	.73 (.73) ***		.92***	.84 (.83) ***		.82***	.67 (.67) ***		-.80**	.64 (.64) ***	
Model 2												
Star Ratings	.66***	.82 (.80) ***	.07 (.06) ***	.89***	.85 (.84) ***	.01 (.01) *	.60***	.78 (.77) ***	.11 (.10) ***	-.70**	.70 (.69) ***	.06 (.05) *
Negative Emotion Words	-.14**						-.21**					
Negations	-.12*						-.15*			.16*		
Money	-.18**						-.16**			.13*		
Second Person	.14*											
Pronouns												
Parenthesis	-.10*											
Anger				-.09*								
First Person Singular							-.14*					
Pronouns												
Positive Feelings										-.15*		

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

### Test of Hypothesis 14

To test hypothesis 14 (Linguistic indicators associated with positive or negative emotions are significantly correlated with eWOM readers' self-reported attitudes, evaluations, and emotional states toward a product/service), Pearson correlations between linguistic indicators generated by ATA methods and eWOM readers' overall evaluations, attitudes, and emotional states toward the focused restaurants were employed.

It is expected that the linguistic indicators associated with negative emotions including Negations, Negative Emotions, Anger, and First Person Pronouns should be positively correlated with eWOM readers' self-reported negative emotions and may be negatively correlated with their self-reported positive emotions, attitudes, and overall evaluations. The linguistic indicators associated positive emotions such as Positive Feelings, Positive Emotions, and Optimism and Energy should be positively correlated with eWOM readers' self-reported positive emotions, attitudes, and overall evaluations and may be negatively correlated with their self-reported negative emotions. As expected, Table 6.21 provides some evidence for the hypothesized correlations. For example, the linguistic indicators associated with positive emotions including Positive Emotions, Positive Feelings, and Optimism and Energy were positively related to eWOM reader' self-reported attitudes, overall evaluations, and overall positive emotions, and negatively related to eWOM readers' self-reported overall negative emotions in general. The significant correlations were weak to moderate correlations (ranging from .22 to .33). The linguistic indicators associated with negative emotions including Negations, Negative Emotions, and Anger were positively correlated with eWOM readers' self-reported overall negative emotions and negatively correlated with eWOM readers' self-reported overall positive emotions, attitudes, and overall evaluations in general. The significant correlations were weak to moderate correlations (ranging from .24 to .53).

Table 6.21  
*Correlations between eWOM Readers' Attitudes, Emotions, Overall Evaluations, Patronage Intentions, and Linguistic Indicators*

Linguistic Indicators	Attitudes	Overall Evaluations	Positive Emotions	Negative Emotions	Patronage Intentions
Word Count	-.01	-.04	-.01	.15	.04
1 <sup>st</sup> Person Singular	-.15	-.12	-.14	.24*	-.07
1 <sup>st</sup> Person Plural	-.08	-.08	-.09	.05	-.09
Total First Person	-.17	-.15	-.17	.23*	-.12
Total Second Person	.13	.15	.16	-.19	.10
Total Third Person	-.10	-.06	-.12	.03	-.13
Negations	-.47***	-.38***	-.40***	.53***	-.42***
Positive Emotions	.31**	.33**	.33**	-.34**	.22*
Positive Feeling	.16	.19	.21*	-.11	.17
Optimism and Energy	.25*	.27*	.25*	-.28**	.13
Negative Emotions	-.40***	-.43***	-.39***	.39***	-.37***
Anxiety or Fear	.00	.00	-.06	-.07	-.05
Anger	-.20	-.24*	-.16	.26*	-.17
Sadness and Depression	-.18	-.19	-.19	.14	-.13
Cognitive Process	-.20	-.19	-.21*	.18	-.27**
Tentative	-.08	-.03	-.09	.16	-.15
Certainty	.10	.09	.08	-.15	-.04
Money	-.30**	-.38***	-.33***	.30**	-.37***
Period	.04	.02	.00	-.09	.05
Comma	.09	.16	.13	-.19	.15
Colon	.17	.16	.14	-.14	.15
Semicolon	.03	.04	.06	-.01	.00
Question Mark	-.19	-.15	-.18	.07	-.15
Exclamation Mark	-.14	-.10	-.10	.12	-.06
Dash	.13	.14	.15	-.07	.08
Quote	-.11	-.07	-.13	.19	-.09
Parenthesis	-.22*	-.15	-.19	.22*	-.02
Apostrophe	-.02	.01	-.02	.08	-.17
Other Punctuations	.07	.11	.10	-.15	.06
All Punctuations	.05	.11	.06	-.11	.09

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

It is also expected that the linguistic indicators associated with negative emotions such as Negations, Negative Emotions, Anger, and First Person Pronouns should be positively correlated with eWOM readers' discrete negative emotions (e.g., anger and sad) and may be negatively correlated with their self-reported discrete positive emotions (e.g., happy and satisfied etc.). The linguistic indicators associated positive emotions such as

Positive Feelings, Positive Emotions, and Optimism and Energy should be positively correlated with eWOM readers' self-reported discrete positive emotions and may be negatively correlated with their self-reported discrete negative emotions. Table 6.22 provides some evidence for these hypothesized correlations. The linguistic indicators associated with positive emotions including Positive Emotions, Positive Feelings, and Optimism and Energy were positively associated with eWOM readers' self-reported discrete positive emotions, and negatively associated with eWOM readers' self-reported discrete negative emotions in general. The significant correlations were weak to moderate correlations (ranging from .21 to .35). As expected, LIWC indicators associated with negative emotions including Negative Emotions, Anger, Sadness and Depression, Anxiety and Fear were positively correlated eWOM readers' self-reported negative discrete emotions, and negatively correlated with eWOM readers' self-reported positive discrete emotions in general. The significant correlations were weak to moderate correlations (ranging from .22 to .40).

Above all, linguistic indicators associated with positive emotions showed significant positive correlations with eWOM readers' self-reported overall evaluations, attitudes, overall positive emotions, and discrete positive emotions, and significant negative correlations with their self-reported overall and discrete negative emotions. Linguistic indicators associated with negative emotions showed significant negative correlations with eWOM readers' self-reported overall evaluations, attitudes, overall positive emotions, and discrete positive emotions, and significant positive correlations with their self-reported overall and discrete negative emotions. Thus, H14 was supported.

Table 6.22  
*Correlations between eWOM Readers' Discrete Emotions and Linguistic Indicators*

	Happy	Delighted	Satisfied	Excited	Mad	Angry	Irritated	Frustrated	Depressing	Disappointed	Sad
Word Count	.02	.00	.01	.04	.21*	.18	.17	.18	.04	.17	.04
1 <sup>st</sup> Person Singular	-.11	-.06	-.14	-.10	.19	.25*	.25*	.25*	.18	.26*	.25*
1 <sup>st</sup> Person Plural	-.90	-.10	-.05	-.12	.05	.10	.09	.08	.07	.10	.06
Total First Person	-.15	-.12	-.15	-.16	-.19	.27**	.26*	.25*	.19	.28**	.24*
Total Second Person	.17	.15	.13	.19	-.22*	-.23*	-.25*	-.26*	-.19	-.27*	-.17
Total Third Person	-.06	-.06	-.09	-.12	-.04	.06	.03	.02	.01	-.00	-.03
Positive Emotions	.28**	.27*	.29**	.28**	-.23*	-.31**	-.31**	-.30**	-.18	-.35**	-.25*
Positive Feeling	.22*	.21*	.25*	.24*	.02	-.03	-.08	-.10	.05	-.08	.03
Optimism and Energy	.27**	.24*	.21	.17	-.26*	-.32**	-.27**	-.28**	-.18	-.28**	-.23*
Negative Emotions	-.38***	-.37***	-.40***	-.34***	.34***	.31**	.33**	.31**	.15	.35***	.13
Anxiety or Fear	-.09	-.08	-.06	-.06	-.13	-.10	-.10	-.10	-.10	-.07	-.11
Anger	-.15	-.13	-.20	-.12	.39***	.20	.24*	.21	-.07	.20	-.03
Sadness and Depression	-.22*	-.20	-.19	-.19	.03	.10	.09	.08	.08	.15	.06
Cognitive Process	-.18	-.18	-.25*	-.20	.11	.15	.14	.12	.10	.16	.13

Table 6.22

*Correlations between eWOM Readers' Discrete Emotions and Linguistic Indicators (Continued)*

Emotions Linguistic Indicators	Happy	Delighted	Satisfied	Excited	Mad	Angry	Irritated	Frustrated	Depressing	Disappointed	Sad
Tentative	-.06	-.06	-.07	-.05	.11	.12	.08	.08	.21*	.15	.24*
Certainty	.03	.03	-.00	.05	-.07	-.14	-.13	-.17	-.10	-.15	-.12
Money	-.35***	-.36***	-.32**	-.32**	.13	.18	.26*	.27**	.25*	.23*	.19
Period	-.06	-.08	.01	-.05	-.14	-.08	-.06	-.01	-.01	-.02	-.02
Comma	.13	.12	.12	.16	-.09	-.15	-.18	-.18	-.25*	-.15	-.22*
Colon	.09	.09	.10	.11	-.10	-.05	-.05	-.04	-.10	-.07	-.11
Semicolon	.10	.09	.09	.09	.01	.01	.00	.00	.01	.00	.00
Question mark	-.17	-.20	-.19	-.17	.04	.12	.09	.09	.18	.07	.16
Exclamation Markers	-.06	-.08	-.12	-.10	.08	.08	.17	.17	.11	.14	.11
Dash	.18	.19	.10	.17	-.05	-.12	-.14	-.13	-.19	-.12	-.12
Quote	-.06	-.06	-.10	-.08	.19	.20	.24*	.22*	.12	.22*	.14
Parenthesis	-.14	-.19	-.17	-.17	.24*	.23*	.26*	.26*	-.01	.25	.05
Apostrophe	.02	.02	-.04	.02	.10	.02	.01	.02	-.11	.05	-.02
Other	.08	.05	.10	.02	-.18	-.19	-.18	-.13	-.12	-.16	-.14
Punctuation All	.06	.03	.05	.07	-.08	-.10	-.10	-.60	.18	-.05	-.14

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

### **Test of Hypothesis 15**

To test hypothesis 15A (Linguistic indicators generated from eWOM predict eWOM readers' self-reported overall evaluations, attitudes, and overall emotion states toward a product/service), four multiple regressions were conducted. EWOM readers' self-reported attitudes, overall evaluations, overall positive emotions, and overall negative emotions toward the focused restaurants served as the dependent variable in each regression respectively. The LIWC indicators that had significant correlations with respective eWOM readers' evaluations, attitudes, and emotions were put into the regressions as the independent variables. Since independent variables were redundant as indicated by the significant correlations among them, stepwise multiple regressions were employed to identify the linguistic indicators that made significant additional contributions in predicting eWOM readers' attitudes, overall evaluations, and overall emotional states toward the focused restaurants. Table 6.23 shows that Negative Emotions, Negations, Money, and Optimism and Energy significantly predicted and explained 35% variance in eWOM readers' attitudes. Negative Emotions, Negations, Money, and Optimism and Energy significantly predicted and explained 36% variance in self-reported overall evaluations. Negative Emotions, Negations, Money, and Positive Emotions predicted and explained 32% variance in eWOM readers' self-reported overall positive emotions. Negative Emotion, Negations, Money, and Positive Emotions significantly predicted and explained 42% variance in eWOM readers' self-reported overall negative emotions. Furthermore, results showed that the linguistic indicators that remained in the stepwise multiple regressions explained around the same amount

variance in eWOM readers' evaluations, attitudes, and overall emotional states as explained by all linguistic indicators that were significantly correlated with eWOM readers' attitudes, evaluations and emotion states toward the focused restaurants. The linguistic indicators that were significantly correlated with eWOM readers' attitudes, evaluations, and emotional states toward the focused restaurants explained 36% variance in self-reported attitudes, 36% in overall evaluations, 32% in overall positive emotions, and 42% in overall negative emotions respectively. Overall, H15A was supported. In addition, regression results showed that Negative Emotions, Negations, and Money are the three strongest predictors of eWOM readers' attitudes, overall evaluations, and overall emotional states.

Table 6.23  
*Multiple Regressions of Linguistic Indicators on eWOM Readers' Attitudes, Overall Evaluations, and Emotional States*

Independent variable	Attitudes		Overall Evaluations		Overall Positive Emotions		Overall Negative Emotions	
	Std. $\beta$	$R^2$ (Adj. $R^2$ )	Std. $\beta$	$R^2$ (Adj. $R^2$ )	Std. $\beta$	$R^2$ (Adj. $R^2$ )	Std. $\beta$	$R^2$ (Adj. $R^2$ )
Negative Emotions	-.27**	.38(.35) ***	-.31***	.39(.36) ***	-.21*	.35(.32) ***	.19*	.44(.42) ***
Negations	-.37***		-.27**		-.31***		.44***	
Money	-.20*		-.27**		-.25**		.21*	
Optimism and Energy	.17*		.19*					
Positive Emotions					.21*		-.21*	

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

To test H15B (Linguistic indicators explain additional variance in eWOM readers' attitudes, overall evaluations, and emotional states toward a product/service beyond and above the star ratings), four stepwise multiple regressions were conducted. EWOM readers' self-reported attitudes, overall evaluations, overall positive emotions, and overall

negative emotions toward the focused restaurants served as the dependent variable in each regression respectively. Star ratings were introduced into the regression models at the first step. Then, all the LIWC indicators that were significantly correlated with respective evaluations, attitudes, and emotional states were input into the models. Stepwise multiple regressions were used to identify the linguistic indicators that explained additional variance in eWOM readers' self-reported attitudes, overall evaluations, and emotional states toward the focused restaurants beyond and above the star ratings. Table 6.24 shows that star ratings were the most important predictors of eWOM readers' attitudes, overall evaluations, overall positive emotions, and overall negative emotions toward the focused restaurants even after introducing the linguistic indicators. Linguistic indicators explained significant additional variance beyond and above star ratings as indicated by significant increase in  $R^2$ . Specifically, Negations contributed additional explanatory power in eWOM readers' self-reported attitudes and negative emotions. Money contributed additional explanatory power in eWOM senders' overall evaluations. Positive Feelings and Cognitive Process made additional contributions in predicting overall positive emotions. Above all, H15B was supported.

Table 6.24  
*Multiple Regressions of Star Ratings and Linguistic Indicators on eWOM Readers' Attitudes, Overall Evaluations, and Overall Emotional States*

Independent Variable	Attitudes			Overall Evaluations			Overall Positive Emotions			Overall Negative Emotions		
	Std. $\beta$	$R^2$ (Adj. $R^2$ )	$\Delta R^2$ (Adj. $\Delta R^2$ )	Std. $\beta$	$R^2$ (Adj. $R^2$ )	$\Delta R^2$ (Adj. $\Delta R^2$ )	Std. $\beta$	$R^2$ (Adj. $R^2$ )	$\Delta R^2$ (Adj. $\Delta R^2$ )	Std. $\beta$	$R^2$ (Adj. $R^2$ )	$\Delta R^2$ (Adj. $\Delta R^2$ )
Model 1												
Star Ratings	.85***	.44 (.43)		.74***	.54 (.54)		.63***	.39 (.39)		-.71**	.51 (.51)	
Model 2												
Star Ratings	.66***	.48 (.47)	.04 (.04)	.69***	.58 (.57)	.04 (.03)	.61***	.45 (.43)	.06 (.04)	-.60**	.58 (.57)	.07 (.06)*
Negative Money	-.24**									.28***		
Positive Feelings				-.20**				.16*				
Cognitive Process								-.17*				

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

### Test of Hypothesis 16

To test hypothesis 16 (EWOM senders' self-reported attitudes, overall evaluations, and emotional states toward a product/service are significantly correlated with eWOM readers' attitudes, overall evaluations, emotional states toward the product/service), Pearson correlations were employed. Table 6.25 shows that the correlations between eWOM senders' and readers' attitudes, overall evaluations, overall positive emotions, and overall negative emotions were all strong correlations, ranging from .71 to .76. Thus, H16 was supported.

Table 6.25

*Correlations among eWOM Senders' and eWOM Readers' Attitudes, Overall Evaluations, and Emotional States*

	1	2	3	4	5	6	7	8
1. Attitudes (Senders)	1.00							
2. Attitudes (Readers)	<b>.72</b> <sup>***</sup>	1.00						
3. Overall Evaluations (Senders)	.86 <sup>***</sup>	.65 <sup>***</sup>	1.00					
4. Overall Evaluations (Readers)	.75 <sup>***</sup>	.91 <sup>***</sup>	<b>.71</b> <sup>***</sup>	1.00				
5. Overall Positive Emotion (Senders)	.97 <sup>***</sup>	.74 <sup>***</sup>	.83 <sup>***</sup>	.75 <sup>***</sup>	1.00			
6. Overall Positive Emotion (Readers)	.70 <sup>***</sup>	.95 <sup>***</sup>	.62 <sup>***</sup>	.90 <sup>***</sup>	<b>.71</b> <sup>***</sup>	1.00		
7. Overall Negative Emotion (Senders)	-.90 <sup>***</sup>	-.73 <sup>***</sup>	-.78 <sup>***</sup>	-.74 <sup>***</sup>	-.90 <sup>***</sup>	-.72 <sup>***</sup>	1.00	
8. Overall Negative Emotion (Readers)	-.78 <sup>***</sup>	-.84 <sup>***</sup>	-.72 <sup>***</sup>	-.81 <sup>***</sup>	-.77 <sup>***</sup>	-.79 <sup>***</sup>	<b>.76</b> <sup>***</sup>	1.00

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

### Summary of the eWOM Communication of Different Types of Information

To summarize the results discussed in this section, three figures (see Figures 6.2-4) were developed to illustrate the eWOM communication of attitudes, positive emotions, and negative emotions, respectively. In these figures, the correlations among different factors in the eWOM communication processes are presented. In addition, the key concepts that measure the effectiveness of eWOM communication including ecologic validity, perceptual validity, cue utilization, and achievement were calculated.

Achievement was measured by Pearson correlations between eWOM senders' attitudes and emotions and corresponding eWOM readers' attitudes and emotions. Ecological validity was measured by both multiple correlations between distal cues and eWOM senders' communication intentions and the variances in communication intentions explained by distal cues. To calculate ecological validity, multiple regressions were

conducted with the distal cues that were significantly correlated with eWOM senders' communication intentions as the independent variables and eWOM senders' communication intentions as the dependent variable. The regression outputs provided the values of multiple correlation and  $R^2$ . Cue utilization was measured by both multiple correlations between proximal cues and eWOM readers' perceived communication intentions and the variances in perceived communication intentions explained by proximal cues. To calculate cue utilization, multiple regressions were conducted with the proximal cues that were significantly correlated with eWOM readers' perceived communication intentions as the independent variables and eWOM readers' perceived communication intentions as the dependent variable. The regression outputs provided the values of multiple correlation and  $R^2$ . Perceptual validity was measured by canonical correlations between distal cues and proximal cues. In the canonical correlation analysis, only the pairs of distal and proximal cues that were significantly correlated with each other were incorporated.

Figure 6.2 presents the communication of attitudes between eWOM writers and readers. It shows that the eWOM communication of attitudes was mainly through the communication cues of service, environment, positive emotion words, negative emotion words, and reducers. This figure shows that both each individual communication link including encoding, perception, and decoding and the whole communication process were effective as indicated by the significant values of ecologic validity, perceptual validity, cue utilization, and achievement.

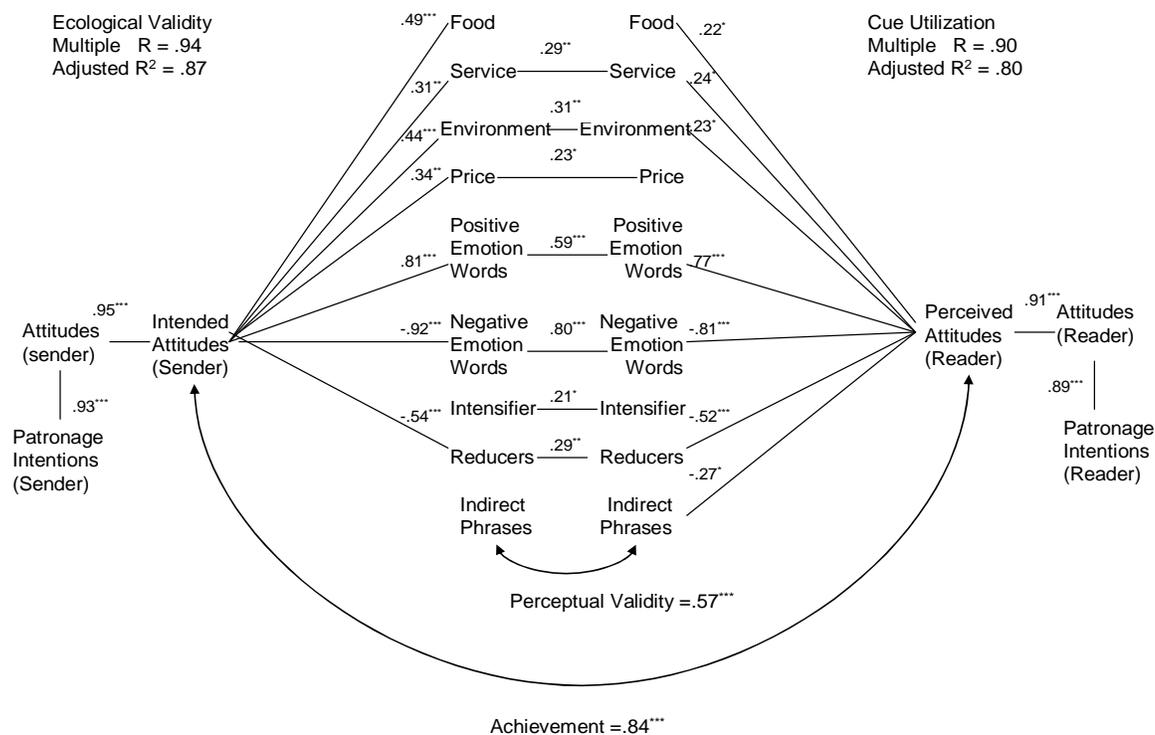


Figure 6.2. eWOM communication of attitudes

Figure 6.3 presents the communication of positive emotions between eWOM writers and readers. It shows that the eWOM communication of positive emotions was mainly through the communication cues of service, environment, positive emotion words, negative emotion words, and reducers. Both each individual communication link including encoding, perception, and decoding and the whole communication process were effective as indicated by the significant values of ecologic validity, perceptual validity, cue utilization, and achievement.

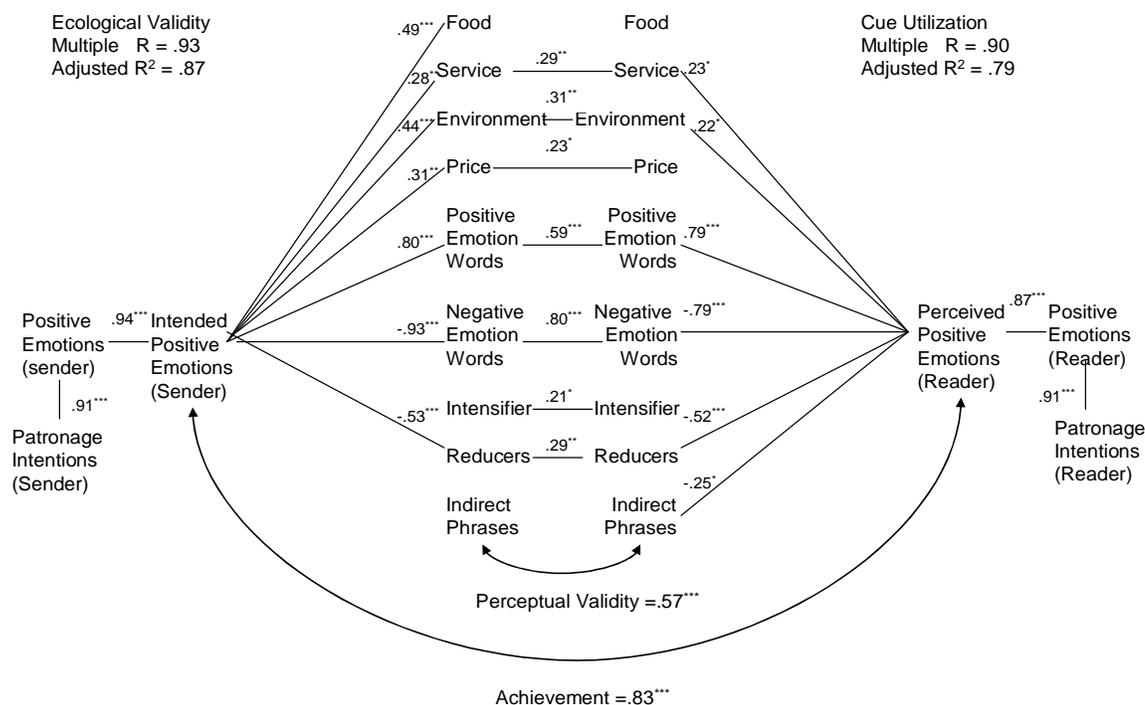


Figure 6.3. eWOM communication of positive emotions

Finally, Figure 6.4 presents the communication of negative emotions between eWOM review writers and readers. It shows that the eWOM communication of positive emotions was mainly through the communication cues of positive emotion words, negative emotion words, and reducers. Both each individual communication link including encoding, perception, and decoding and the whole communication process were effective as indicated by the significant values of ecologic validity, perceptual validity, cue utilization, and achievement.

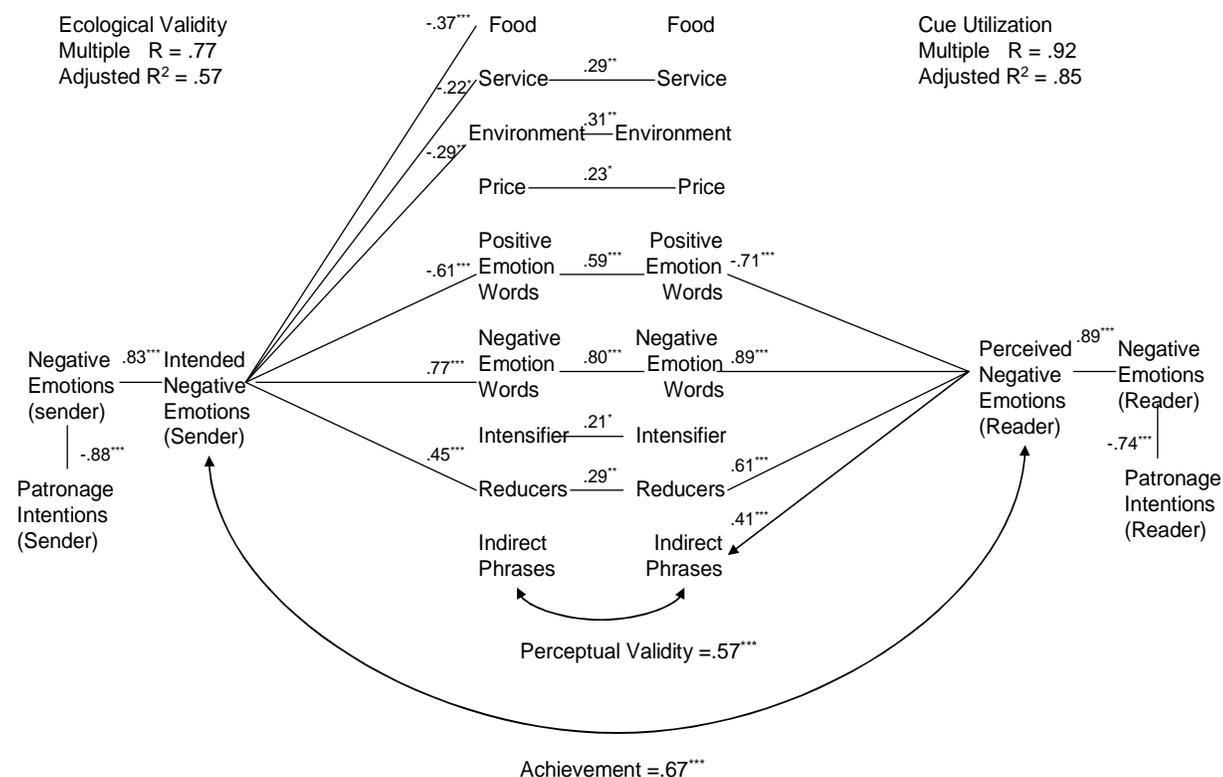


Figure 6.4. eWOM communication of negative emotions

### Further Exploratory Analysis

Although hypothesis testing evaluated some important relationships and provided new insights into the understanding of eWOM communication process, some questions still remain unanswered. For example, which of the three eWOM communication processes (encoding, perception, and decoding) is stronger than the others? Which communication cues are more important than the others? To answer these questions, path analysis were employed to further explore the nature of the eWOM communication.

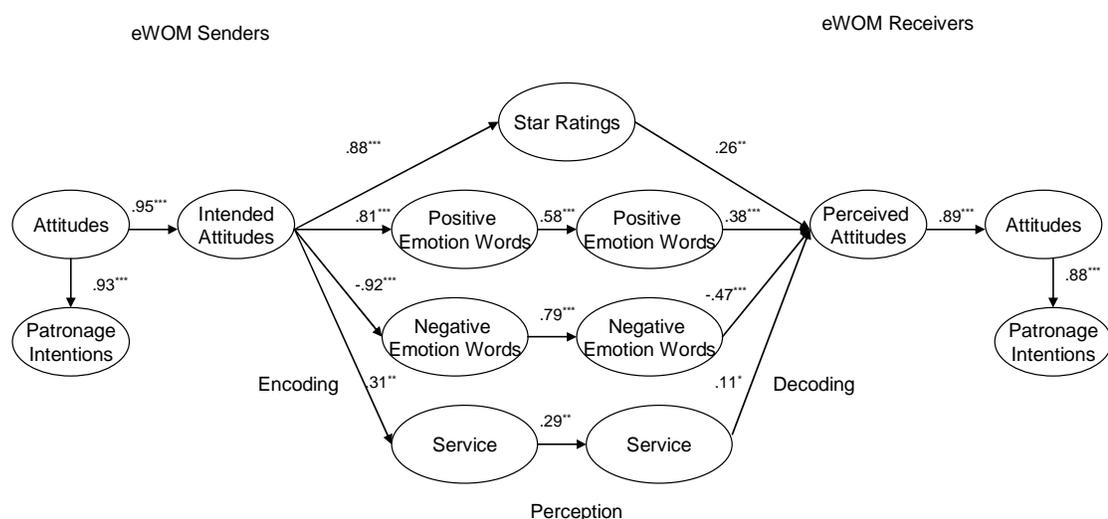
Since the theories on these topics haven't been well developed, the analysis below is exploratory in nature.

Path analysis was employed to demonstrate the information flow in eWOM communication process and indicate the relative strength of each eWOM communication link. Lisrel 8.8 was used to conduct the path analysis. Three separate path models were established first to examine eWOM communication of attitudes, positive emotions, and negative emotions respectively. A comprehensive path model was then established to examine the information communication through eWOM when both attitudes and emotions were considered simultaneously. The communication cues that were remained in the multiple regressions in testing H4b and H7b were employed in the path models because these cues made significant contributions to the eWOM communication process. In addition, since the sample size is relatively small (n=90), all the variables were treated as manifest variables. Means were used for those variables with multiple indicators.

### **Path Analysis on eWOM Communication of Attitudinal Information**

The first model showed the evaluation of the communication of attitudinal information among consumers through online reviews (see Figure 6.5). The overall model fit was acceptable,  $\chi^2_{(63)}=133.52$ , NFI=.95, NNFI=.97, CFI= .98, RMSEA= .10 (90% C.I. = .07; .13). Figure 6.5 shows that eWOM senders' attitudes predicted their future patronage intentions and intended attitudes. Furthermore, intended attitudes were encoded into four distal cues: star ratings, positive emotion words, negative emotion words, and service. The verbal cues of positive emotion words and negative emotion words and the content cue of service were then captured by eWOM readers and converted

into proximal cues. Proximal cues along with star ratings predicted eWOM readers' perceived eWOM senders' attitudes, which furthermore determined their own attitudes. At last, eWOM partners' attitudes predicted their patronage intentions toward the focused restaurants. As the result of eWOM communication, 81% variance in eWOM readers' perceived attitudes, 80% variance in eWOM readers' attitudes and 78% variance in eWOM readers' patronage intentions were explained.



*Figure 6.5.* Path model on eWOM communication of attitudinal information

In order to compare the relative strength of the three major processes of eWOM communication: encoding, perception, and decoding in terms of the effectiveness of information communication, a group of nested model comparisons were conducted. The

first model comparison was to evaluate the relative strength of the paths in the encoding and decoding processes. In the nested model, the path coefficients from intended attitudes to star ratings and distal cues were constrained to be equal to the coefficients of corresponding paths from star ratings and proximal cues to eWOM readers' perceived attitudes. For example, the path coefficient from eWOM senders' attitudes to star ratings were set equal to the path coefficient from star ratings to eWOM readers' perceived attitudes. The path coefficient from eWOM senders' attitudes to the distal cue of positive emotion words was set equal to the path coefficient from the proximal cues of positive emotion words to eWOM senders' perceived attitudes. Compared to the original model, the overall model fit of the nested model was significantly worsened, as indicated by a significant increase in Chi-square ( $\Delta\chi^2 = 11.7$ ,  $\square df=4$ ,  $p < .05$ ). The results indicated that the paths in the encoding process were significantly stronger than the corresponding paths in the decoding process in general. Using the same model comparison approach, the path strength in the encoding and perception processes, in the decoding and perception processes were compared. The results indicated that the paths in both the encoding process and the decoding process did not differ significantly from those in the perception process as indicated by insignificant changes in Chi-square in the nested models ( $\Delta\chi^2 = 6.18$ ,  $\square df=3$ ,  $p > .05$  for decoding vs. perception;  $\Delta\chi^2 = 4.35$ ,  $\square df=3$ ,  $p > .05$  for encoding vs. perception). It indicated that the strength of information communication in the perception process was as strong as in both the encoding and the decoding process.

Furthermore, the relative importance of star rating and distal cues in the encoding process was compared by nested model comparisons. The first model comparison was to

evaluate the relative strength of the path from eWOM senders' intended attitudes to star ratings and the path from eWOM senders' intended attitudes to the distal cue of negative emotion words. In the nested model, the path coefficient from intended attitudes to star ratings was constrained to be equal to the path coefficient from intended attitudes to negative emotion words. The result indicated that negative emotion words had a significantly stronger path coefficient than star ratings as indicated by a significant increase in Chi-square ( $\Delta\chi^2 = 4.35$ ,  $\square df=1$ ,  $p < .05$ ). Following the same steps, the relative importance of star ratings, positive emotion words, negative emotion words, and service in the encoding process was compared. The results showed that star ratings had a stronger path coefficient than positive emotion words as indicated by a significant increase in Chi-square ( $\Delta\chi^2 = 5.70$ ,  $\square df=1$ ,  $p < .05$ ); positive emotion words had a stronger path coefficient than service as indicated by a significant increase in Chi-square ( $\Delta\chi^2 = 34.98$ ,  $\square df=1$ ,  $p < .01$ ). Overall, these results indicated that in the encoding process, negative emotion words were the most important cue, followed by star ratings and positive emotion words. The content cue of service conveyed less information in eWOM senders' attitudes than both star ratings and emotion words in the encoding process.

Employing the same model comparison approach, the relative strength of paths in the perception process was compared. The comparisons between negative emotion words and positive emotion words, positive emotion words and service, negative emotion words and service were not significant as indicated by insignificant changes in Chi-square ( $\Delta\chi^2 = .73$ ,  $\square df=1$ ,  $p > .05$ ;  $\Delta\chi^2 = .73$ ,  $\square df=1$ ,  $p > .05$ ;  $\Delta\chi^2 = 2.86$ ,  $\square df=1$ ,  $p > .05$ ). This result indicated

all the three types of communications cues encoded by eWOM senders had the equal chance to be perceived by eWOM readers when they read online reviews.

In addition, the relative importance of star ratings and proximal cues in the decoding process was compared by nested model comparisons. Model comparison results showed that negative emotion words carried more attitudinal information than star ratings in the decoding process as indicated by a significant increase in Chi-square ( $\Delta\chi^2 = 4.35$ ,  $\square df=1$ ,  $p < .05$ ). Both positive and negative emotion words were more important than star ratings (Positive emotion words vs. star ratings:  $\Delta\chi^2 = 6.57$ ,  $\square df=1$ ,  $p < .05$ ; Negative emotion words vs. star rating:  $\Delta\chi^2 = 5.70$ ,  $\square df=1$ ,  $p < .05$ ) and service (Positive emotion words vs. service:  $\Delta\chi^2 = 6.72$ ,  $\square df=1$ ,  $p < .05$ ; Negative emotion words vs. service:  $\Delta\chi^2 = 8.14$ ,  $\square df=1$ ,  $p < .01$ ). There was no significant difference between star ratings and service ( $\Delta\chi^2 = .12$ ,  $\square df=1$ ,  $p > .05$ ), positive emotion words and negative emotion words ( $\Delta\chi^2 = .08$ ,  $\square df=1$ ,  $p > .05$ ). These results indicated that the verbal cues of negative and positive emotions words played the most important role in decoding process. Star ratings and the content cue of service conveyed less information than the verbal cues of emotion words when eWOM readers' infer eWOM readers' attitudinal information.

### **Path Analysis on eWOM Communication of Positive Emotions**

This model shows the information communication of positive emotions among consumers through online reviews (see Figure 6.6). The overall model fit was acceptable,  $\chi^2_{(43)} = 93.76$ , NFI=.97, NNFI=.98, CFI= .98, RMSEA= .10 (90% C.I. = .07; .14). The result showed in Figure 6.6 indicated that eWOM senders' overall positive emotions toward restaurants predicted their patronage intentions toward the restaurants and the

positive emotions they intended to communicate to other consumers regarding the focused restaurants through online reviews. Furthermore, intended positive emotions were encoded into three distal cues: star ratings, positive emotion words, and negative emotion words. The distal cues of positive emotion words and negative emotion words were then captured by eWOM readers and were converted into proximal cues. Proximal cues along with star ratings predicted eWOM readers' perceived positive emotions, which furthermore determined their own overall positive emotions towards the focused restaurants. At last, eWOM readers' overall positive emotions predicted their patronage intentions toward the restaurants. As the result of the information communication, 79% variance in eWOM readers' perceived overall positive emotions, 73% variance in eWOM readers' own overall positive emotion toward the focused restaurants, and 81% variance in eWOM readers' patronage intentions were explained.

The relative strength of the three major processes of eWOM communication: encoding, perception, and decoding in terms of the communication of positive emotions were compared by nested model comparisons. Model comparison results indicated that the path coefficients in the encoding process were significantly stronger than the corresponding path coefficients in the decoding process and in the perception process in general as indicated by significant increases in Chi-square (Encoding vs. decoding:  $\Delta\chi^2=16.13$ ,  $\square df=3$ ,  $p<.01$ ; Encoding vs. perception:  $\Delta\chi^2=7.32$ ,  $\square df=3$ ,  $p<.01$ ). The results also indicated that the path coefficients in the decoding process did not differ significantly from the corresponding path coefficients in the perception process as indicated by an insignificant change in Chi-square ( $\Delta\chi^2=5.31$ ,  $\square df=3$ ,  $p>.05$ ). Overall,

the above result implied that the information communication of positive emotions is stronger in the encoding process than in both the perception and the decoding processes.

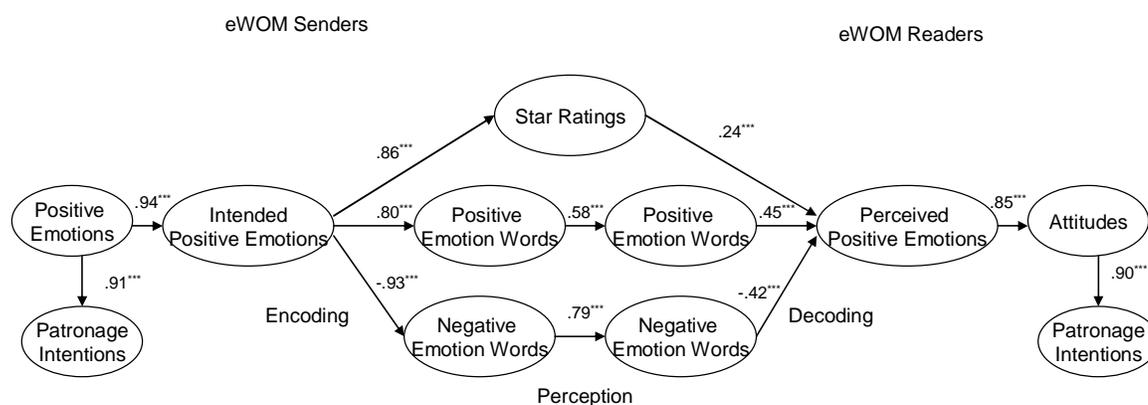


Figure 6.6. Path model on eWOM communication of positive emotions

The relative importance of star ratings and distal cues in the encoding process was compared by nested model comparisons. The model comparison results showed that negative emotion words had a stronger negative path coefficient than positive emotion words and star ratings had positive path coefficients as indicated by significant increases of Chi-square in the nested models (Negative emotion words vs. star ratings:  $\Delta\chi^2 = 9.08$ ,

df=1,  $p < .01$ ; Negative emotion words vs. positive emotion words:  $\Delta\chi^2 = 20.32$ , df=1,  $p < .01$ ). There was no significant difference between positive emotion words and star ratings ( $\Delta\chi^2_{(1)} = 2.41$ , df=1,  $p < .01$ ). Above all, the results indicated that negative emotion words contributed of a more important cue than positive emotion words and star ratings for eWOM senders in the communication of their positive emotions.

Employing the same model comparison approach, the relative strength of the paths in the perception process was compared. The comparison between negative emotion words and positive emotion words was not significant as indicated by an insignificant change in Chi-square ( $\Delta\chi^2 = .31$ ,  $\square$ df=1,  $p > .05$ ). This result indicated that both positive emotion words and negative emotion words encoded by eWOM senders had an equal opportunity to be perceived by eWOM readers when they read online reviews. Neither of the cues was more likely to be comprehended.

In addition, the relative importance of star ratings and proximal cues in the decoding process was compared by nested model comparisons. Model comparison results showed that positive emotion words have stronger path coefficients than star ratings as indicated by a significant increase of Chi-square in the nested model ( $\Delta\chi^2 = 9.98$ ,  $\square$ df=1,  $p < .01$ ). There is no significant difference between negative emotion words and positive emotion words ( $\Delta\chi^2 = 1.70$ ,  $\square$ df=1,  $p > .05$ ), negative emotion words and star ratings ( $\Delta\chi^2 = 3.62$ ,  $\square$ df=1,  $p > .05$ ). This result indicates that positive emotion words were more important cues than star ratings for eWOM readers in their perception of eWOM senders' positive emotions.

### **Path Analysis on Communication of Negative Emotions**

The model showed the evaluation of the information communication of negative emotions among consumers through online reviews (see Figure 6.7). The overall model fit was marginally acceptable,  $\chi^2_{(43)} = 273.43$ , NFI=.89, NNFI=.88, CFI= .91, RMSEA= .24 (90% C.I. = .21; .27). The results indicated that eWOM senders' overall negative emotions toward restaurants predicted their patronage intentions toward the restaurants and the negative emotions they intended to communicate to other consumers regarding the focused restaurants through online reviews. Furthermore, intended negative emotions were encoded into three distal cues: star ratings, positive emotion words, and negative emotion words. The distal cues of positive emotion words and negative emotion words were then captured by eWOM readers and converted into proximal cues. Proximal cues along with star ratings predicted eWOM readers' perceived negative emotions, which furthermore determined their own overall negative emotions towards the focused restaurants. Finally, eWOM readers' overall negative emotions predicted their patronage intentions toward the restaurants. As the result of the information communication, 85% variance in eWOM readers' perceived negative emotions, 75% variance in eWOM readers' own overall negative emotions, and 50% variance in eWOM readers' patronage intentions were explained.

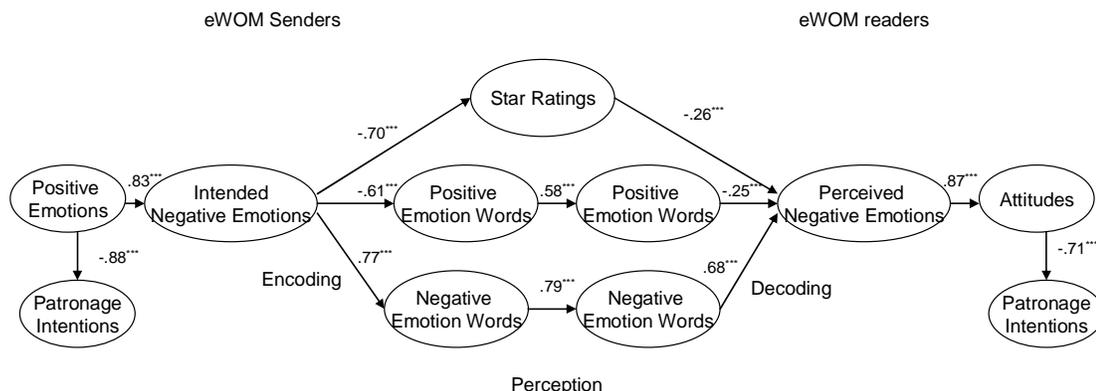


Figure 6.7. Path model on eWOM communication of negative emotions

The relative strength of the three major processes of eWOM communication of negative emotions: encoding, perception, and decoding were compared by nested model comparisons. Model comparison results indicated that there was no significant difference among the path coefficients in encoding process, decoding process, and perception process in general (Encoding vs. decoding:  $\Delta\chi^2 = 5.92$ ,  $df=3$ ,  $p>.05$ ; Encoding vs. perception:  $\Delta\chi^2 = 1.13$ ,  $df=2$ ,  $p>.05$ ; Decoding vs. perception:  $\Delta\chi^2 = 1.20$ ,  $df=2$ ,  $p>.05$ ). It indicated that the information communication were equally strong in the three communication links (encoding, decoding, and perception).

The relative importance of star rating and distal cues in the encoding process was compared by nested model comparisons. The model comparison results showed that negative emotion words had a stronger path coefficient than positive emotion words as indicated by a significant increase of Chi-square in the nested model ( $\Delta\chi^2 = 5.61$ ,  $df=1$ ,  $p < .05$ ). There was no significant difference between positive emotion words and star ratings ( $\Delta\chi^2 = 1.50$ ,  $df=1$ ,  $p < .01$ ), negative emotion words and star ratings ( $\Delta\chi^2 = 1.34$ ,  $df=1$ ,  $p < .01$ ). Above all, the result showed that negative emotion words were a more important cue than positive emotion words for eWOM senders in expressing their negative emotions.

Employing the same model comparison approach, the relative strength of paths in the perception process was compared. The comparisons between negative emotion words and positive emotion words was not significant as indicated by an insignificant change in Chi-square ( $\Delta\chi^2 = 3.06$ ,  $df=1$ ,  $p > .05$ ). This result indicated that all positive emotion words and negative emotion words encoded by eWOM senders were equally perceived by eWOM readers when they read online reviews. Neither of the cues was more likely to be picked up than the other.

In addition, the relative importance of star ratings and proximal cues in the decoding process was compared by nested model comparisons. Model comparison results showed that negative emotion words have a stronger path coefficients than star ratings and positive emotion words as indicated by significant increases of Chi-square in the nested models ( $\Delta\chi^2 = 8.55$ ,  $df=1$ ,  $p < .01$  for star ratings vs. negative emotion words;  $\Delta\chi^2 = 7.70$ ,  $df=1$ ,  $p < .01$  for positive emotion words vs. negative emotion words). There was no

significant difference between star ratings and positive emotion words ( $\Delta\chi^2 = .06$ ,  $\square df=1$ ,  $p>.05$ ). This result indicated that the negative emotion words were more important than star ratings and positive emotion words for eWOM readers in their perception of eWOM senders' negative emotions.

### **A Comprehensive Path Model of EWOM Communication**

A comprehensive model was developed to demonstrate the information flows in eWOM communication process when attitudes and emotions were all considered simultaneously (see Figure 6.8). The overall model fit was acceptable,  $\chi^2_{(175)} = 982.85$ , NFI=.90, NNFI=.89, CFI= .91, RMSEA= .18 (90% C.I. = .16; .19). However, the paths from intended negative emotions to star ratings and positive emotion words and the path from eWOM readers' own negative emotions to their patronage intentions were not significant. Thus the three insignificant paths were dropped, and the overall fit of the revised model was acceptable,  $\chi^2_{(178)} = 983.85$ , NFI=.90, NNFI=.90, CFI= .91, RMSEA= .18 (90% C.I. = .16; .19). Although there was no significant difference in the model fit between the two models as indicated by insignificant change of Chi square ( $\Delta\chi^2 = 1.00$ ,  $\square df=3$ ,  $p>.05$ ), since the revised model was more parsimonious, the revised model was used as the final model. Seventy six percent of variance in eWOM senders' patronage intentions and 73% variance in eWOM readers' patronage intentions were explained in this model.

Most of the results from the comprehensive model were consistent with those of the previous models. The results showed that eWOM partners communicated restaurant information mainly through the communication cues of star ratings, positive emotions

words, and negative emotion words. However, the results also showed that when all the factors were considered, eWOM senders encoded their overall negative emotions only into negative emotion words. In contrast, eWOM readers inferred eWOM senders' overall negative emotions through star ratings, positive emotion words, and negative emotion words. Furthermore, eWOM readers' overall negative emotions toward the focused restaurants didn't influence their future patronage intentions. In contrast, eWOM senders' patronage intentions were determined by their own attitudes, overall negative emotions, and overall positive emotions.

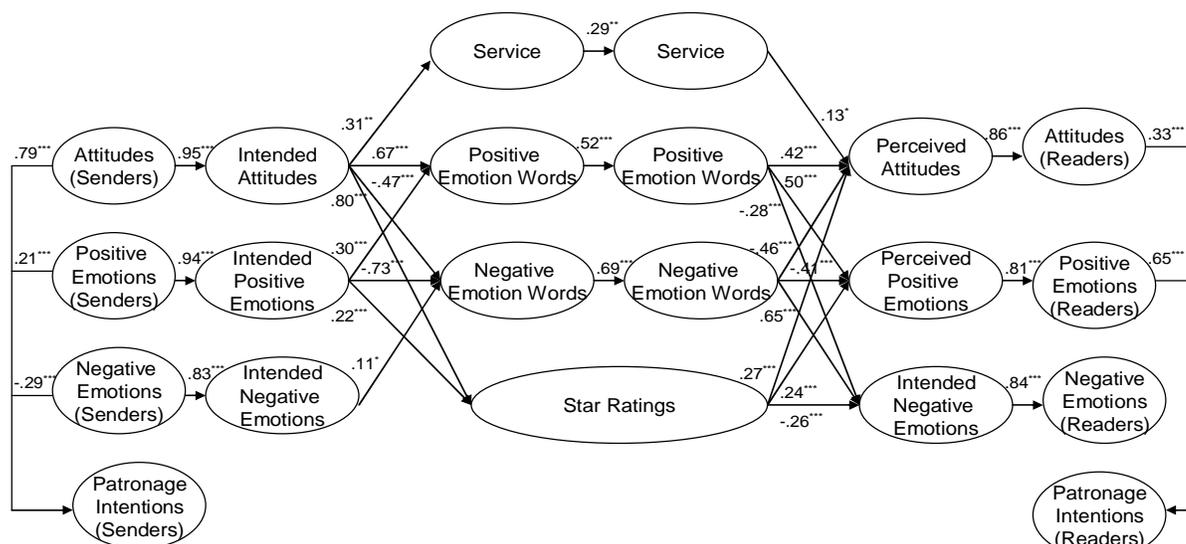


Figure 6.8. A Comprehensive model of eWOM communication

Because one way to evaluate the effectiveness of eWOM communication is to measure the total impact of eWOM communication process on the outcomes of communication - eWOM readers' attitudes, emotions, and patronage intentions, the total effects of eWOM senders' intended attitudes and emotional states along with the total effects of communication cues on eWOM readers' attitudes, emotional states, and patronage intentions were calculated. Table 6.26 shows that eWOM senders' intended attitudes and intended overall positive emotions has significant total effects on eWOM readers' attitudes, overall positive emotions, overall negative emotions, and future patronage intentions toward the focused restaurants. However, eWOM senders' intended negative emotions showed significant effect on eWOM readers' negative emotions, and did not influence their attitudes, positive emotions, and patronage intentions. It may imply that information about attitudes and positive emotions can be effectively communicated through online reviews, thereby exerting a significant effect on eWOM readers. However, the information on negative emotions may not be effectively communicated and thereby exerting relatively a smaller effect on eWOM readers. The results also showed that both distal and proximal cues of positive emotion words and negative emotion words had significant effects on eWOM readers' attitudes, emotional states, and patronage intentions. It implies that these communication cues had been effectively encoded, detected, and interpreted in the eWOM communication process, thereby producing significant effects on eWOM readers. Last, the distal content cue of service exerted significant effects on eWOM readers' attitudes and patronage intentions, which may imply that the content of online reviews also plays a role in changing eWOM

readers' attitudes and patronage intentions, but it may not change eWOM readers' emotional states.

Table 6.26  
*Total Effects on eWOM Outcomes*

	Attitudes (Reader)	Positive Emotions (Readers)	Negative Emotions (Readers)	Patronage Intentions (Readers)
Intended Attitudes (Senders)	.45 <sup>***</sup>	.41 <sup>***</sup>	-.43 <sup>***</sup>	.43 <sup>***</sup>
Intended Positive Emotions (Senders)	.31 <sup>***</sup>	.28 <sup>***</sup>	-.35 <sup>***</sup>	.29 <sup>***</sup>
Intended Negative Emotions (Senders)	-.03	-.03	.04 <sup>*</sup>	-.03
Star Rating	.23 <sup>***</sup>	.20 <sup>***</sup>	-.22 <sup>***</sup>	.21 <sup>***</sup>
Positive Emotion words (Distal)	.19 <sup>***</sup>	.21 <sup>***</sup>	-.12 <sup>***</sup>	.20 <sup>***</sup>
Positive Emotion words (Proximal)	.36 <sup>***</sup>	.41 <sup>***</sup>	-.23 <sup>***</sup>	.38 <sup>***</sup>
Negative Emotion words (Distal)	-.27 <sup>***</sup>	-.23 <sup>***</sup>	.37 <sup>***</sup>	.25 <sup>***</sup>
Negative Emotion words (Proximal)	-.40 <sup>***</sup>	-.34 <sup>***</sup>	.54 <sup>***</sup>	-.36 <sup>***</sup>
Services (Distal)	.03			.02
Services (Proximal)	.11 <sup>*</sup>			.06 <sup>*</sup>

## **CHAPTER 7**

### **DISCUSSION, CONCLUSIONS, AND IMPLICATIONS**

The purpose of this concluding chapter is to further discuss the findings and implications of this study and provide a summary of conclusions from these findings. This chapter includes four sections. In the first section, the findings of the study were discussed in order to provide insight regarding their meaning. Based on the discussion, the major conclusions of this study are provided. Then, the theoretical and practical implications are discussed. Last, the limitations of this study and recommendations for future research are provided.

#### **Discussion of Findings**

This study had three objectives: (1) explore the effectiveness of eWOM communication; (2) identify the communication cues employed by consumers and examine their roles in eWOM communication; and (3) validate the computer-based quantitative content analysis method in studying eWOM. To achieve the above goals, this study employed the Brunswik's Lens Model to conduct data collection from both eWOM senders and receivers. The key findings of this study are discussed in the following three sub-sections.

#### **The Effectiveness of eWOM Communication**

The effectiveness of eWOM communication was determined by the strength of the information flow in each eWOM communication link. For example, whether product/service information was strongly converted into communication cues in the encoding process, whether eWOM readers precisely detected the communication cues

encoded by eWOM senders in the perception process, and whether eWOM readers made full use of the communication cues they detected to infer eWOM senders' attitudes and emotions in the decoding process. In this study, ecological validity, perceptual validity, and cue utilization were used to measure the effectiveness of encoding, perception, and decoding processes respectively. Furthermore, variances explained by communication cues were also employed to evaluate the effectiveness of encoding and decoding processes. The overall effectiveness of eWOM communication was evaluated in two ways: (1) Achievement suggested by the Brunswik's Lens Model; and (2) the outcomes of the eWOM communication or the impact of eWOM communication on eWOM readers.

According to Cohen's (1988) guideline for interpreting the magnitude of correlations, all the effectiveness indicators including ecological validity, perceptual validity, cue utilization, and achievement in this study are strong correlations. Furthermore, communication cues explained at least half of the variance in eWOM partners' attitudes, emotional states, or perceptions. These results indicate that eWOM communication of attitudinal and emotional information via online reviews in decoding, perception and decoding processes is effective.

Specifically, ecological validity reflects the effectiveness of the encoding process and indicates the extent to which an eWOM sender's intended attitudinal and emotional information has been transferred into distal cues. Higher ecological validity indicates that more information is being conveyed through distal cues. The multiple correlations between distal cues and intended attitudes, intended positive emotions, and intended

negative emotions were .94 ( $p < .001$ ), .93 ( $p < .001$ ), and .77 ( $p < .001$ ) respectively, which are all strong correlations. The variance in eWOM senders' intended attitudes, intended positive emotions, and intended negative emotions explained by distal cues were 87%, 87%, and 57% respectively. These results indicated that the encoding process was successful since encoded distal cues have strong correlations with and explained a significant amount variance in eWOM senders' communication intentions. These distal cues were fully used in expressing eWOM senders' attitudes and emotions. This result provides evidence for the effectiveness of the encoding process.

In this study, perceptual validity was measured by canonical correlations between distal cues and proximal cues, indicating the extent to which the distal cues encoded by eWOM senders were actually detected by eWOM readers and then effectively converted into eWOM readers' proximal cues. Canonical correlation results showed that perceptual validity was .57 ( $p < .001$ ), which is strong correlation. This result indicated that distal cues were not exactly equivalent to the proximal cues, but in general distal cues were relatively precisely detected by eWOM readers and effectively converted into eWOM readers' proximal cues. This result provides evidence for the effectiveness of the perception process.

Cue utilization, in this study, was measured by (1) multiple correlations between proximal cues and eWOM readers' perceived attitudes and emotional states and (2) the variance in eWOM readers' perceived attitudes and emotional states explained by proximal cues. This reflects the effectiveness of the decoding process and indicates the extent to which proximal cues are being utilized by eWOM readers when they develop

their perception about eWOM senders' intended attitudes and emotions. The multiple correlations between proximal cues and eWOM readers' perceived attitudes, perceived positive emotions, and perceived negative emotions were .90 ( $p < .001$ ), .90 ( $p < .001$ ), and .92 ( $p < .001$ ), respectively, which are strong correlations. The variance in perceived attitudes, perceived positive emotions, and perceived negative emotions explained by proximal cues were 80%, 79%, and 85%, respectively. Overall, these results indicate that the decoding process is successful since proximal cues have strong correlations with and explained a significant amount variance in eWOM readers' perceptions of eWOM senders' communication intentions. Thus, proximal cues played an important role in shaping eWOM readers' perceptions. This result provides evidence about the effectiveness of the decoding process.

Achievement was measured by the Pearson correlations between eWOM senders' self-reported communication intentions and eWOM receivers' perceptions of eWOM senders' communication intentions. It reflects the effectiveness of the whole eWOM communication process. Higher achievement indicates that eWOM readers capture more product/service information intentionally delivered by eWOM senders. Achievements for eWOM communication of attitudes, positive emotions, and negative emotions were .84 ( $p < .001$ ), .83 ( $p < .001$ ), and .67 ( $p < .001$ ), respectively, which are strong correlations. These measures imply that eWOM readers can relatively effectively capture the information that eWOM senders intend to deliver, demonstrating the effectiveness of all eWOM communication processes as a whole. These findings from this study provided support for social information processing approach (Walther, 1992) reported in the

computer-mediated-communication literature. Social information processing approach suggests that computer-mediated-communication is as effective as face-to-face communication. Some studies (e.g., Walther, Loh, and Granka, 2005; Walther and Burgoon, 1992; Kato, Kato, and Akahori, 2007) have provided empirical evidence for this approach by finding that emotions and other social information can be communicated equally effectively in both computer-mediated-communication and face-to-face communication conditions. For example, Boonthanom (2004) found that via different communication cues such as emotion words, linguistic markers, and paralinguistic cues, email readers can effectively detect the information communicated via emails. This study added to the growing body of evidence for the effectiveness of online communication by extending the context to eWOM communication.

Another way to evaluate the effectiveness of eWOM communication is to measure its impact on eWOM readers. In other words, the extent to which the eWOM communication process can explain the changes in eWOM readers' attitudes, emotional states, and future patronage intentions toward a focused product/service after reading online reviews is evaluated. In this study, restaurant names had been removed before eWOM readers read the online reviews in order to eliminate the confounding effects of prior experience. Thus, the attitudes and emotions that eWOM readers reported toward the focused restaurants serve as the proxies of changes in their attitudes and emotional states. Results showed that eWOM communication explained at least 65% percent of the variance in eWOM readers' attitudes, positive emotions, negative emotions, and future patronage intentions toward the focused product/service. These results indicated that

eWOM communication had a substantial influence on eWOM readers. In addition, the comprehensive path model showed that eWOM senders' attitudes and emotional states had significant total effects on eWOM readers' attitudes, emotional states, and future patronage intentions. Some previous studies (e.g., Gruen, Osmonbekov, and Czaplewski, 2006; Dellarocas, Farag, and Zhang, 2004) have found empirical relationships between eWOM and consumers' purchasing behaviors or product sales. However, these findings provided only indirect evidence for the effectiveness of eWOM because there might be a third variable (e.g., advertising, professional reviews, or previous experience) that caused the significant effects in these studies. This study excluded the effects of other factors by eliminating the names of the restaurants and provided direct evidence for the effectiveness of eWOM.

Above all, the results in this study indicated that not only each individual communication link i.e., encoding, perception, and decoding was effective but also the whole eWOM communication process was effective.

Furthermore, this study compared the relative effectiveness of the three key processes of eWOM communication including encoding, perception, and decoding. The results from this study showed that the encoding process was stronger than the decoding process in eWOM communication of attitudes and positive emotions, while there was no significant difference between the effectiveness of the encoding process and that of the decoding process in communicating negative emotions. One possible explanation for these results was that, though eWOM senders tried to express their attitudes and positive emotions through certain communication cues, eWOM readers failed to pay attention to

these communication cues. This implies that the coding system used by eWOM readers may be different from that of eWOM senders in communicating positive emotions and attitudes. In contrast, both eWOM senders and readers pay attention to the communication cues when they communicate negative emotions. Thus, the effectiveness of information communication through online reviews varies in different communication links and is contingent on the types information communicated.

This study found that encoding process was stronger than the decoding process in communicating attitudes and positive emotions. This result is contradictory to the findings of previous studies. Traditional studies employing Brunswik's Lens Model (e.g., Gifford, 1994; Borkeanu and Liebler, 1992) suggest that the decoding process is stronger than encoding process in social perception: encoding is usually weak or moderate; decoding is often strong. This contradictory result may be because that in eWOM process, information senders have strong motivation to convey their emotions and attitudes through the online reviews and as a result, the encoding process is very strong. To contrast, in social perception the target of perception such as interpersonal dispositions may not be very reliably encoded in such communication cues as nonverbal behaviors, although observers seem eager to use nonverbal information to decode the dispositions of others (Gifford, 1994).

The ineffectiveness of WOM communication came from three sources. First, distal cues did not capture all the information in eWOM senders' attitudes and emotions. For example, around 20% of the variance in eWOM senders' attitudes and emotions was not explained by distal cues. Second, distal cues were not precisely perceived by eWOM

readers. For example, the proximal cues of “food” and “indirect phrases” perceived by eWOM readers were significantly different from the corresponding distal cues intentionally communicated by eWOM senders. Third, the readers’ inference structure in decoding did not exactly mirror the senders’ encoding structure. For example, during the communication of attitudinal information, negative emotion words were more important than positive emotion words in eWOM senders’ encoding process, while negative emotion words and positive emotion words were equally important in eWOM readers’ decoding process. Furthermore, the comprehensive path models showed that eWOM senders used only negative emotion words to convey their negative emotions. In contrast, eWOM readers inferred eWOM senders’ negative emotions through positive emotion words, negative emotion words, and star ratings. The systematic differences in the coding systems employed by communication partners are common in interpersonal communication. For example, in studying the communication of emotions in music performance, Justin (2000) found that some systematic differences in the cue utilization among music performers and listeners. Overall, the interpersonal information communication is not perfect.

### **Communication Cues in eWOM Communication**

#### *Identifying Communication Cues*

The success of a lens model analysis largely depends on whether the most appropriate set of cues has been identified (Justin, 2000). Based on a comprehensive literature review and two focus groups, this study developed a comprehensive list of distal and proximal cues used by consumers in their eWOM communication. After testing

inter-rater reliabilities, nine reliable communication cues remained including food, service, environment, price, positive emotion words, negative emotion words, intensifiers, reducers, and indirect phrases.

However, not all of the above reliable communication cues are fully functional in eWOM communication. The communication through some cues was broken down during certain links in the eWOM communication process. The information communication through the above cues fell into two categories. The information communication via the first category of communication cues was significant in all three links of eWOM communication including encoding, transmission and decoding. Thus, these communication cues were used to encode eWOM senders' attitudes and emotions, were precisely perceived by eWOM readers, and were used to a significant degree by eWOM readers to decode or infer eWOM senders' attitudes and emotions. The rest communication cues fell in the second category because communication flow via these cues broke down during certain communication links. The breaking down of the information flow could occur during any eWOM link. For example, in communicating attitudinal information, eWOM senders used the distal cue of price to convey their attitudes and this cue was precisely detected by eWOM readers. However, eWOM readers did not use the cue of price to develop their perception about eWOM senders' attitudes. Therefore, the information flow was interrupted during the decoding process. The details about the two categories of communication cues employed by consumers during eWOM communication and the information flow via these cues are further discussed in the three paragraphs below.

Communication of attitudes and positive emotions were mainly through five cues: service, environment, positive emotion words, negative emotion words, and reducers. The rest of the cues fell into the second category. For example, neither of the eWOM partners used the cue of intensifiers during their encoding or decoding process. Although eWOM senders conveyed information through price and the cue of price was detected by eWOM readers, eWOM readers did not consider the cue of price when they developed their perception about the attitudes of eWOM senders. In other words, the information communication through the cue of price broke down at the decoding process. In addition, the information communication through indirect phrases broke down during both the encoding and perception processes.

The communication of negative emotions occurred mainly through three cues: positive emotion words, negative emotion words, and reducers. All the rest cues fell into the second category. For example, neither of eWOM partners used the cues of price and intensifiers in communicating their negative emotions although eWOM readers precisely detected these cues used by eWOM senders. EWOM senders intended to communicate the negative emotions through their content cues of food, service, and environment; however eWOM readers ignored this information even though they precisely detected the information. EWOM readers' used indirect phrases as a cue to infer the negative emotions intentionally delivered by eWOM senders. However, eWOM senders did not intentionally convey their negative emotions through indirect phrases, and eWOM readers did not precisely capture the indirect phrases eWOM senders used. Above all, the information communication using the cues of food, environment, price, service,

intensifiers, and indirect phrases was broken. As a result, eWOM readers depended solely on three linguistic cues to infer eWOM senders' intended negative emotions.

This section showed eWOM communication went through several communication cues. Furthermore, eWOM partners employed different cues when they communicated attitudes and positive emotions versus when they communicated negative emotions. These results indicate that eWOM partners' coding system in communicating positive information may be different from the coding system in communicating negative emotions.

The findings regarding the role of non-verbal cues in interpersonal communication are not consistent in previous studies. On the one hand, some studies (e.g., Argyle et al., 1970; Hancock, Landrigan, and Silver, 2007) suggested that non-verbal cues (e.g., emoticons, indirect verbal, and punctuations) played an important role in the interpersonal communication, especially in face-to-face communication. For example, Lea and Spears (1992) suggested that paralanguage (e.g., emoticons and punctuations) is one important means by which social information is communicated in computer-mediated-communication. Argyle et al. (1970) found that non-verbal cues accounted for 10.3 times as much variance as verbal cues in face-to-face interpersonal perception. On the other hand, some studies found that verbal cues played much important role than non-verbal cues in online communication. For example, Walther and D'Addario (2001) found that emoticons were overshadowed by verbal statements that they accompanied, and they played a complementary role to verbal cues at best. This study found that verbal cues such as positive emotion words and negative emotion words

played the most important role in the eWOM communication process. In this study, all the non-verbal cues (e.g., emoticons, vocal spelling, and punctuations) failed the reliability test. It implies that consumers may interpret the non-verbal cues differently and as a result non-verbal cues may not be able to communicate reliably in the online communication. The inconsistency in the findings regarding the role of non-verbal cues in online communication deserves future research.

#### *Cue Redundancy*

The correlation results showed that both distal cues and proximal cues are redundant as indicated by significant correlations among communication cues. In fact, cue redundancy is very common in interpersonal communication, which has been identified in some previous studies (e.g., Gifford, 1994; Justin, 2000). The redundancy of the cues makes the communication process relatively robust. As a result, even if an eWOM partner neglects some information, he/she may still express or capture the same tone of online reviews. Furthermore, given that the same information is conveyed by multiple cues, a smaller subset of critical cues can provide a maximum amount of predictive power. In this study, stepwise multiple regressions showed that there were no more than four cues remaining in the regression equations and these small sets of communication cues explained around the same amount of variance in eWOM partners' attitudes and emotions as explained by all communication cues.

#### *The Role of the Star Ratings in eWOM Communication*

Each online review includes a star rating and a text review. Star ratings were straightforward and salient cues for both eWOM partners in communicating their

attitudes and emotional tones. Results from this study supported that star ratings are important predictors and can explain a significant amount variance in eWOM partners' attitudes and emotional states. The study also found that star ratings explained 20% more variance in eWOM senders' intended attitudes and positive emotions than in eWOM readers' perceived attitudes and positive emotions. This implies that eWOM senders paid more attention to star ratings in their encoding process than eWOM readers did in their decoding process when communicating attitudes and positive emotions. However, the situation is reversed when communicating negative emotions. Star ratings explained 10% more variance in eWOM readers' perceived negative emotions than in eWOM senders' intended negative emotions. Thus, star ratings played a more important role for eWOM readers in inferring negative emotions than for eWOM senders in expressing their negative emotions. This result implies that star ratings may play different roles in communicating positive information versus negative information.

#### *The Role of Communication Cues in eWOM Communication*

This study focused on the communication cues contained in the text reviews including content cues, verbal linguistic cues, and nonverbal linguistic cues. This study found that both verbal cues and content cues in text reviews explained additional variance in eWOM partners' attitudes and emotional states beyond the star ratings. Specifically, the verbal cues of positive emotion words and negative emotion words made an additional contribution in predicting eWOM senders' attitudes and positive emotions. Together, they explained around 15% of the additional variance in eWOM senders' attitudes and positive emotions beyond and above the star ratings. The verbal cue of

negative emotion words made a significant additional contribution in predicting eWOM senders' negative emotions by explaining 17% additional variance in eWOM senders' negative emotions beyond and above the star ratings. Positive emotion words, negative emotion words, and service made an additional contribution in predicting eWOM readers' perceived attitudes. Together, they explained 26% of the variance in eWOM readers' perceived attitudes beyond and above the star ratings. Positive and negative emotion words made an additional contribution in predicting eWOM readers' positive emotions and negative emotions. Together, they explained 27% and 29% additional variance in eWOM readers' perceived positive emotions and perceived negative emotions respectively. Overall, these results suggest that both star ratings and verbal cues contained in text reviews are important in eWOM communications. The communication cues contained in the text reviews can explain additional variance beyond and above star ratings.

In addition, it is interesting to find that the communication cues explained around 8% to 9% more variance in eWOM partners' attitudes and positive emotions in the encoding process than in decoding process in general. Therefore, distal cues carried more information associated with attitudes and positive emotions than proximal cues did. In contrast, in communication of negative emotions, communication cues explained 27% more variance in decoding process than in encoding process, demonstrating that proximal cues convey more information associated with negative emotions than distal cues. This implies that eWOM readers were eager to infer eWOM senders' negative emotions through proximal cues but eWOM senders did not convey so much information about their

negative emotions via distal cues. Overall, communication cues played more important role in the encoding process than in decoding process when communicating attitudes and positive emotions, and in the decoding process than in encoding process when communicating negative emotions.

#### *eWOM Communication of Attitudes versus Emotions*

This study found that eWOM partners relied on star ratings and emotion words in communicating emotions. However, when it comes to attitudes, the content cues of service explained additional variance. This result implied that when eWOM partners communicate attitudinal information, they also consider the characteristics of the restaurant. In other words, star ratings and emotion words matter most in eWOM communication of both attitudinal information and emotional information, but content cues gain importance when attitudinal information is communicated. The reason that cues employed in the communication of attitudes were different from those employed for emotions were different may be that attitudes have cognitive evaluation component. Because cognitive information communication occurs is mainly through content cues (Boonthanom, 2004), content cues were employed in eWOM communication of attitudes. In contrast, eWOM communication of emotions was not conveyed via content cues.

#### *Relative Importance of Star Rating and Communication Cues*

As to the relative importance of star ratings and different communication cues in eWOM communication process, the model comparisons provided some valuable information. In the encoding process of attitudinal information, the relative importance of communication cues was negative emotions words > star ratings> positive emotion

words > service. For the decoding process of attitudinal information, the relative important of communication cues was positive emotion words and negative emotion words > star ratings and service. For the encoding of positive emotions, the relative importance of cues was negative emotion > star ratings and positive emotion words; for the decoding of positive emotions, the relative importance of cues is positive emotions words > star rating. For the encoding of negative emotions, the relative importance of cues was negative emotion words > positive emotions words. For the decoding of negative emotions, the relative importance of cues was negative emotions words > positive emotion words and star ratings.

These results showed that relative importance of communication cues in the encoding process was different from the relative importance of communication cues in the decoding process. This implies that consumers used different cues when they expressed their attitudes and emotions in writing online reviews compared to when they inferred others' attitudes and emotions in reading online reviews. In other words, the inference structure employed by eWOM readers did not mirror the encoding structure used by eWOM senders. But eWOM senders' and readers' coding systems have many similarities, which contributes to effective eWOM information flow in general. In addition, that relative importance of the communication cues is different among the communication of different types of information, thereby implying that consumers may have different coding systems when communicating different types of information. However, overall the verbal cue of negative emotion words played the most important role across all situations. This result is consistent with some previous studies. For

example, Ahluwalia (2002) suggested that compared to positive information, negative information is more thought-provoking, over-weighted, and perceived to be more diagnostic in judgment formation. Thus, eWOM partners may pay more attention to the cues of negative emotion words than the other cues.

### **The Validities of LIWC Indicators**

One important goal of this study is to examine the validity of ATA linguistic indicators in studying eWOM. To achieve this objective, this study examined (1) concurrent validity (correlations between LIWC indicators and eWOM partners' self-reported emotions) and (2) the predictive utility of linguistic indicators on eWOM partners' attitudes and emotional states. To empirically test these validities, this study employed one popular ATA software-LIWC.

This study found that in general LIWC indicators associated with emotions were significantly correlated with eWOM partners' self-reported overall positive emotions and overall negative emotions. Specifically, the linguistic indicators of Positive Emotions and Negative Emotions showed moderate to strong correlations with eWOM partners' self-reported overall positive emotions and overall negative emotions. Furthermore, some sub-categories of emotion words in LIWC were significantly correlated with eWOM partners' self-reported discrete emotions. For example, the LIWC indicator of Anger showed moderate correlations with eWOM partners' self-reported anger. In addition, the linguistic indicators of Negative Emotions and Positive Emotions showed moderate to strong correlations with eWOM partners' self-reported usages of negative emotion words

and positive emotion words. All above significant correlations provided the evidence for the concurrent validity of LIWC indicators in studying eWOM.

Furthermore, results from this study showed that linguistic indicators significantly predicted and explained additional variance in eWOM partners' attitudes and emotions beyond and above the star ratings. Specifically, Negative Emotions, Negations, Money, Second Person Pronouns, Parenthesis, First Person Singular Pronouns, and Positive Emotions explained additional variance in eWOM senders' attitudes and emotions beyond and above the star ratings. Negations, Money, Positive Feelings, and Cognitive Process explained additional variance in eWOM readers' attitudes and emotions beyond and above the star ratings. Overall, these results provided evidence for the predictive utility of linguistic indicators in predicting eWOM partners' attitudes and emotional states.

Ortony et al. (1987) suggested that language is the most convenient channel to study emotions, and emotion words are the best way to reflect the emotional experience. Results of this study are consistent with this argument. With only a couple of exceptions, this study found that LIWC indicators associated with emotions were moderately correlated with eWOM partners' corresponding self-reported emotions. However, Owen et al. (2006) found insignificant correlations between the LIWC indicators of Positive Emotion and individuals' self-report positive emotions ( $r=.17$ ), and between the LIWC indicator of Negative Emotions and individuals' self-report negative emotions ( $r=.25$ ). Given that both LIWC indicators and self-reported emotions capture consumers' emotional experience, it is easy to understand the significant correlations between them. Although the correlations were not strong in this study, in general, and a couple of the

correlations were weak in magnitude, they were in the right direction and thus demonstrated that there is a positive association between LIWC indicators and corresponding self-reported measures. One reason for these low to moderate correlations may be because the word categories on subtle cues in consumers' minds are not necessarily reflected in the word counts in LIWC (Alpers et al., 2005). For example, in LIWC, Negations includes a group of words such as "never" and "not", representing a denial, contradiction, or negative statement. Results in this study showed that Negations has a significant correlation with eWOM partners' self-reported usage of negative emotion words. This result suggested that the categories used by consumers may be only partially overlapped with the LIWC categories. Negations may be treated as negative emotion words by consumers, although it is a separate category in LIWC. This result implies that comprehensive categories may be scored more accurately by LIWC indicators because they are aggregates of several subcategories. This study supported this assumption by finding that the general categories of Negative Emotions and Positive Emotions have stronger correlations with eWOM partners' attitudes and emotions than LIWC sub-categories on emotions in general. The second reason for the low to moderate correlations may be because that linguistic indicators and self-reported measures capture different information in consumers' memory. Bohanek, Fivush, and Walker (2005) suggested that subjective ratings require individuals to condense their entire memory experience into very few global responses, while text writing uses fine-grained, specific and concrete information in memory. In addition, consumers consider the context

information in self-reporting, while context is ignored in LIWC analysis (Bantum and Owen, 2009; Alpers et al., 2005).

Besides linguistic indicators associated with emotion words, this study found that several other linguistic indicators such as Negations, Pronouns, and Money were also significantly correlated with eWOM partners' self-reported attitudes and emotions. Furthermore, there LIWC indicators contributed unique explanatory power to eWOM partners' attitudes and emotions. This result is consistent with some previous studies. For example, Weitaub (1989) found that use of 1st person singular was associated with negative affective states. Information senders with positive emotions used more positive emotions words, fewer negations, fewer first person pronouns, and more other oriented pronouns; information senders with negative emotions used more negations and negative emotion words (Hancock, Landrigan, and Silver, 2007; Bohanek, Fivush, and Walker, 2005). In addition, Money contains the words related to price and value in LIWC. Since price and value is an important dimension in product/service evaluation, it is reasonable to find a stronger correlation between Money and self-reported attitudes and emotions than most of other LIWC indicators.

Above all, this study provided initial evidence for the concurrent validity and predictive utility of LIWC indicators in studying eWOM communication. This study also suggests that beside linguistic indicators on emotion words, other indicators such as Negations, Pronouns and Money should be incorporated in the text analysis to provide additional explanatory power.

### **A Summary of eWOM Communication Process**

Based on all the models discussed above, a summary on eWOM communication process is provided here. EWOM communication starts when eWOM writers develop their attitudes and emotions toward a product or service based on their own experience. EWOM senders' attitudes and emotions predict their patronage intentions toward the focused restaurants and the attitudes and emotions they intend to communicate to other consumers regarding the focused restaurants through online reviews. Furthermore, when writing online reviews, intended attitudes and emotions are encoded into star ratings and distal cues such as positive emotion words and negative emotion words. These distal cues are then captured by eWOM readers and converted into proximal cues when eWOM readers read the online reviews. Proximal cues along with star ratings predict eWOM readers' perceived attitudes and emotions, which furthermore determine their own attitudes and emotions towards the focused restaurants. At last, eWOM readers' overall attitudes and emotions predict their patronage intentions toward the restaurants. The results in this study show that negative emotion words and positive emotions words are the most important cues in communicating both emotions and attitudes, while the content cue of service is functional only when communicating attitudinal emotions. Furthermore, in the context of restaurants, eWOM senders' negative emotions are not effectively communicated in the eWOM communication process, and eWOM readers develop their patronage intentions mainly depending on their own attitudes and positive emotions toward the focused restaurant. In addition, eWOM communication is an effective and

complex process containing both weak and strong links and is contingent on the different information communicated.

### **Conclusions**

Based on above discussion, the conclusions of this study were summarized as below. .

1. All the individual communication links including encoding, transmission, and decoding and the whole eWOM communication process of disseminating attitudes and emotions through online reviews is effective. This conclusion is supported by significant ecological validity, cue utilization, perceptual validity, and achievement and more than half of the variance in eWOM partners' attitudes, emotions, and perceptions explained by eWOM communication process.

2. The relative strength of information flow varies in different eWOM communication links for different types of information. For example, the encoding process is stronger than the decoding process in communicating attitudes and positive emotions. In contrast, encoding is as effective as decoding in communicating negative emotions.

3. Consumers employ different cues and communication cues played different roles in communicating different types of information. The communication of attitudes and positive emotions was mainly through six reliable cues: star ratings, service, environment, positive emotion words, negative emotion words, and reducers. The communication of negative emotions was mainly through four reliable cues: star ratings, positive emotion words, negative emotion words, and reducers. Star rating and communication cues played more important roles in the encoding process than in the decoding process when

communicating attitudes and positive emotions, and in the decoding process than in the encoding process when communicating negative emotions.

4. The communication cues are redundant, and a small subset of communication cues can provide a maximum amount of predictive power. For example, in this study a subset of no more than four cues explained around the same amount of variance in eWOM partners' attitudes and emotions as explained by all communication cues.

5. The relative importance of star ratings and communication cues is different in the encoding and decoding processes. It indicates that consumers employ a different coding system in expressing their own emotions and attitudes from in inferring others' attitudes and emotions. For example, in the encoding of attitudinal information, negative emotion words were the most important cue, followed by star ratings and positive emotion words. The content cue of service played the least important role. In contrast, in the decoding of attitudinal information, negative and positive emotions words played the most salient roles. Star ratings and the content cue of service conveyed less information. In the encoding of positive emotions, negative emotion words were more important cues than positive emotion words and star ratings, while in the decoding of positive emotions, positive emotion words were more important cues than star ratings. In the encoding of negative emotions, negative emotion words were more important than positive emotion words, while in the decoding of negative emotions, negative emotion words were more important than the star ratings and positive emotion words.

6. In general, negative emotion words are the most important cues in eWOM communication across different situations, followed by the star ratings and positive

emotion words. The content cue of service played some role in eWOM communication of attitudinal information. All these cues explained additional variance in eWOM partners' attitudes and emotional states beyond and above the star ratings.

7. This study provided initial evidence for the concurrent validity and predictive utility of LIWC indicators in studying eWOM. Linguistic indicators were significantly correlated with eWOM partners' self-reported attitudes and emotions. Linguistic indicators such as Negations, Negative Emotions, and Money were significant predictors of eWOM partners' attitudes, overall evaluations, and emotional states. They explained additional variance in eWOM partners' attitudes, overall evaluations, and emotional states toward a product/service beyond and above the star ratings.

### **Implications**

This paper contributes to the literature on eWOM in several important ways and provides some significant implications for consumer researchers and marketing practitioners. First, this study demonstrated that the Process Model of eWOM Communication developed in this study is an effective tool in studying eWOM communication. The Process Model of eWOM Communication was developed based on Brunswik's Lens Model. No other theoretical framework is better than Brunswik's Lens Model in examining the process of interpersonal communication in a comprehensive and systematic fashion (Scherer, 2003). However, due to the high requirement of time and money, few empirical studies using a complete lens model have been conducted before (Scherer, 2003). This study is the first time to apply Brunswik's Lens Model to study eWOM communication. The Process Model extended the traditional Brunswik's Lens

models in several ways: (1) the outcome of eWOM communication was incorporated to better measure the effectiveness of eWOM communication; (2) distal cues and proximal cues were differentiated, and perceptual validity was introduced to measure the effectiveness of the information transmission (or perception) process; (3) linguistic cues (especially verbal cues) were emphasized in this study. This Process Model provided a complete picture of eWOM communication including all the important elements of eWOM communication including encoding, perception (or transmission), and decoding. It demonstrated how information flows in the eWOM communication and which communication cues are employed by the communication partners. The terminologies of ecological validity, perceptual validity, cue utilization, and achievement were used to evaluate the effectiveness of each eWOM communication link and the whole communication process. Finally, by examining the Process Model of eWOM Communication via path analysis, this study demonstrated the information flow in the eWOM communication processes and compared the relative strength of information flow between and within the communication links. Overall, this study demonstrated that the Process Model of eWOM Communication is a fundamental tool for studying eWOM communication and it can be employed in future studies to shed new light on the understanding of eWOM communication.

Second, this study answered two of the most fundamental yet unanswered questions about eWOM communication. These include whether eWOM communication is effective and to what extent eWOM communication is effective. It has been widely believed by both marketing researchers and lay consumers that eWOM communication is effective

and exerts an important influence on other consumers and on firms' market performance. Many studies on eWOM communication were conducted based on this assumption. Some studies have found the significant relationships between eWOM indicators (e.g., star ratings) and market performance indicators (e.g., product sales). However, these empirical results have only indirectly implied that eWOM communication is effective. There is no direct evidence that shows whether the eWOM communication process itself is effective or not. The extent to which the information communication through eWOM is effective and how much eWOM senders' attitudes and emotions can influence eWOM readers' attitudes, emotions and future patronage intentions towards the focused product/service is still unknown. Based on the survey data from both the senders and readers of eWOM communication, this study provided direct evidence regarding the above questions. The results of this study showed that eWOM communication is highly effective in general. Thus, these empirical findings lay out a solid foundation for future research on eWOM communication. Future research can use the findings from this study as evidence for the effectiveness of eWOM communication to further explore the new insights into the market impact of eWOM communication.

Third, one limitation of most previous studies that have examined the market impact of eWOM communication has focused on star ratings and, therefore, has neglected any information that is contained in the actual textual reviews. This study showed that communication cues contained in textual reviews can explain a significant amount of additional variance beyond and above the star ratings. This result indicated that both star ratings and text reviews are informative. In investigating eWOM, managers and

researchers should not only check the average star ratings in online reviews, but also analyze the actual textual reviews since they may provide additional information beyond the star ratings.

Fourth, based on a comprehensive literature review and two focus groups, this study developed a list of communication cues used by consumers in their eWOM communication and furthermore found that some cues such as positive emotion words and negative emotion words played a more important role than other cues in eWOM communication. This result calls for special attention to these communication cues for marketers and researchers. Furthermore, this study found that communication cues are redundant in eWOM communication. Regression results showed that no more than four communication cues explained around the same amount variance of eWOM partners' communication intentions or perceptions as that explained by all communication cues. This result indicated that if marketing researchers or practitioners can identify a couple of the most important cues, they can capture the most valuable information contained in online reviews. The results of this study suggests that for eWOM communication of restaurant information, star ratings, positive emotions words, negative emotion words, and service are the most important cues that consumer researchers and marketing practitioners should attend to.

Fifth, most pervious studies treat the eWOM communication process as a black box and care only about its outcomes, i.e., the market impact of eWOM communication. This study opened the black box and demonstrated that there are different elements and links involved in eWOM communication. It also showed that the strength of the information

flow and the relative importance of the communication cues are different for different situations. For example, most of previous studies based on the Brunswik's Lens Model omitted the transmission or perception process. This study extended our understanding on the transmission process by demonstrating that the information communication in the perception process is strong but not perfect. In another example, this study showed that the encoding process is stronger than the decoding process in communicating positive emotions and attitudes, while there is no significant difference between them in communicating negative emotions. Thus, consumer researchers and marketing practitioners should not assume that eWOM communication is a simple, smooth, and static process. In fact, eWOM communication is a complex process containing multiple steps, having strong and weak points, and varying with different types of information. This inside information sheds new light on the understanding of eWOM communication.

Finally, automatic text analysis may become a promising method in studying eWOM. Although consumers use words to convey their ideas and emotions in their daily life and word use can reflect their basic social and psychological states, very few studies have examined the natural language used among consumers in the real world. One important reason is that there is a lack of efficient tools to analyze texts efficiently and effectively. With recent advances in computerized text analysis, ATA provides a tool to reliably and quickly deal with the large amount of texts (Mairesse, Walker, Mehl, and Moore, 2007). As discussed above, quantitative text analysis is an efficient and easy-to-use software to extract objective and quantified evaluative information from the textual reviews. Furthermore, ATA goes beyond self-reports in important ways. For example, unlike other

data sources that have been used in consumer research, such as interviews, surveys, and experiments, textual review data comes from natural and ecologically valid sources. Thus, ATA may capture information (such as implicit attitudes and nuanced emotions) that cannot be captured by the star ratings or by other research methods. Overall, ATA and linguistic indicators may help researchers and managers to provide new insights into the understanding of eWOM communication beyond the traditional research methods.

In addition, this study examined the concurrent validity and predictive utility of ATA. This study found that LIWC indicators were significantly correlated with eWOM partners' self-reported attitudes and emotions. Furthermore, several linguistic indicators such as Negations and Negative Emotions significantly predicted and explained additional variance in eWOM partners' attitudes and emotional states above and beyond star ratings. This study provided the first evidence for the validity of LIWC indicators in studying eWOM communication.

The findings regarding the ATA method from this study provide some implications for both marketing practitioners and consumer researchers. This study supports that ATA is a convenient and valid method in studying eWOM, and its indicators explained additional variance in eWOM partners' attitudes and emotions beyond and above the study ratings. ATA should be used by marketing practitioners and consumer researchers to capture the valuable information contained in online reviews. In fact, it is a very simple process. First, marketing practitioners and consumer researchers download the text reviews from consumer online forums. They then input the text reviews into the ATA software to generate linguistic indicators. Last, marketing practitioners and

consumer researchers use the linguistic indicators along with the star ratings to predict consumers' attitudes and emotional states toward a product or service and furthermore the market performance of firms. By doing so, marketing practitioners and consumer researchers are able to capture significantly more consumer information than relying solely on the star ratings.

In addition, the findings from this study provide some practical suggestions for eWOM writers and readers to improve the effectiveness of their eWOM communications. First, eWOM writers and readers should understand that the eWOM communication process is effective, in general, and the information delivered through online reviews exerts significant influence on eWOM readers. Thus, eWOM writers should be responsible in what they write on the Internet. Second, this study provides some strategies for eWOM writers. For example, eWOM writers should fully utilize such cues as star ratings, negative emotion words, positive emotions words, and service provided by a restaurant in delivering their attitudes and emotions to other consumers because these four cues play the most important role in eWOM communication. Third, this study also provides some valuable information for eWOM readers. EWOM readers should not only base their judgment on the star ratings but also on the text reviews because text reviews contain valuable information beyond and above the star ratings. Furthermore, according to the findings of this study, eWOM readers should pay attention to several important cues when reading online review such as negative emotions words, positive emotion words, and service offered by a restaurant because eWOM senders mainly use these cues to convey their attitudes and emotions. By considering both the star ratings and

communication cues contained in text reviews, eWOM readers are able to achieve a better understanding of the information communicated by eWOM writers.

### **Limitations and Future Research**

Several potential limitations merit consideration for this study. First, the generalizability of the findings should be examined in future studies. In this study, all review data were collected from a single context, restaurants. In addition, the total number of reviews collected was relatively small. These limitations potentially restrict the generalizability of the results. Future studies are needed that assess a larger sample size and test the results in multiple contexts.

Second, although the process model of eWOM communication developed in this study provides a systematic tool for evaluating eWOM communication process, further extension of and modifications on this model are needed in order to capture the true nature of eWOM communication. For example, in this study, eWOM communication of attitudes and emotions were treated as separate processes. However, the cognitive-emotive framework (Bagozzi, 1992) suggested that cognitive evaluations may trigger emotional responses. Thus, future research is needed to incorporate the interactions between communicating cognitive information and communicating emotional information. Furthermore, this study considered only consumers' attitudes, emotional states, and patronage intentions toward a product or service as the outcomes of eWOM communication. There are other important outcomes of eWOM communication deserving of future research attention. For example, consumers' intentions to distribute the online reviews to other consumers and their perceived pervasiveness of the online

reviews should be examined in future research. Overall, the modifications and extensions on the original process model should provide a better understanding of the eWOM communication process.

Third, this study identified 16 communication cues through the literature review and focus group interviews. However, the inter-rater reliability tests showed that seven of the cues had low reliabilities and were dropped from the analysis. However, some unreliable cues such as vocal spelling, emoticons, and grammatical markers have been widely suggested as important cues in Internet communication (Boonthanom, 2004; Planalp, DeFrancisco, and Rutherford, 1996). Future research should be exerted to investigate reasons why these cues were not reliably decoded by eWOM readers. Large individual differences or inappropriate measures may be the reasons. If eWOM readers use communication cues idiosyncratically, the inter-rater reliability should be low and it would be inappropriate to incorporate these unreliable cues into analysis. But if the unreliable cues were caused by measurement artifacts, future research should be conducted to improve the measurement and provide more reliable cues. In this study, communication cues were measured purely by their quantities. For example, content cues including food, service, price, and environment were measured by as the extent to which each cue was used in the online reviews. However, whether the content cues were positive or negative was not considered in this study. In the future, both the quantity and the valence of content cues should be considered in order to provide a better understanding of the communication cues. For another example, in this study, emoticons were measured by the total number of emoticons used. Since some emoticons express

positive emotions and the others represent negative emotions, it may be better to measure each type of emoticon (e.g., ☺ and ☹) separately in the future research.

Furthermore, although this study used a comprehensive literature review and two focus group interviews to generate eWOM communication cues, there may be some other important cues that were neglected. Future exploratory study should be conducted to identify a more complete list of communication cues employed by eWOM partners. For example, this study found that distal cues for expressing negative emotions explained only 59% variance in eWOM senders' intended negative emotions, which is much lower than the variance explained in attitudes (87%) and positive emotions (88%). This may be because some important cues that eWOM senders employed in expressing their negative emotions were missing in the study.

Fourth, this study captured some interesting findings that need to be verified via future studies. First, this study showed that the information flow is stronger in some communication links than in others. For example, the encoding process is stronger than the decoding process in communicating the information associated with attitudes and positive emotions. However, there is no significant difference between them in communicating negative emotions. Second, consumers employed different cues in the decoding process compared to the encoding process and the relative importance of communication cues in the encoding process was different from those used in the decoding process. Third, verbal cues were the most important cues in eWOM communication. Especially, the communication cue of negative emotion words played the most important role in eWOM communication. The above findings provide new

insights into the eWOM communication process. However, whether these findings reflect a common pattern or are constrained by context needs future examination. If a consistent pattern across contexts or some boundary situations can be identified, it will significantly improve our understanding of the eWOM communication process.

Fifth, expert coding is needed in future research to identify the role of communication cues in eWOM communication. In this study, the same consumers served as both the raters of communication cues and the encoders or decoders. This may compromise the independence of the communication cues and eWOM partners' self-reported emotional states and attitudes (Gifford, 1994). It may also introduce common-method bias. In addition, eWOM senders' self-reported usages of communication cues were not consistent with eWOM readers' perceptions regarding eWOM senders' usages of communication cues. For example, eWOM senders' self-reported usages of food, service, price, environment and positive emotion words were significantly higher than eWOM readers' perceptions regarding eWOM senders' usages of these communication cues. The reasons underlying the differences between eWOM partners' self-reported usages of communication cues deserve future research. To avoid these biases, third party expert raters should be introduced in future research.

Sixth, although online reviews provide a good opportunity for researchers to study WOM mechanisms and consumer behavior in general, the measures of eWOM have not been well developed. For example, the star rating is the mostly widely used proxy of the valence of eWOM in the extant literature. However, the validity of star ratings has been challenged (Hu, Pavlou, and Zhang, 2006). Findings from this study suggested that some

linguistic and content cues can explain significant variance in the information communication between eWOM partners. However, there are still questions regarding how to effectively measure these linguistic and content cues. Future research should be conducted to develop eWOM measures that can capture the rich information contained in online reviews.

Furthermore, the eWOM communication of attitudes, positive emotions, and negative emotions were studied separately in this study. Because of the small sample size, this study used manifest variables in all analyses. In future research, a latent variable that evaluates the valence of eWOM may be developed with three indicators: cognitive evaluation, positive emotions, and negative emotions. This latent construct can be theoretically justified since it has been widely accepted that a product evaluation consists of a cognitive process resulting in a performance evaluation outcome as well as an emotional response. Since, compared to a single manifest variable, a latent variable with multiple measures has some advantages, such as reducing measurement error and identifying the “true” relationship between constructs, it is expected that the latent construct of eWOM valence should better capture the nature of eWOM compared with the traditional single eWOM measure such as star ratings. It may also help researchers to evaluate the relationships between eWOM and consumers’ attitudes and emotions more accurately in the future. In addition, by using this latent variable, researchers would be able to consider the communication of attitudes and emotions simultaneously and tell a more concise story. Above all, the measurement of eWOM that can capture the rich

information contained in online reviews is an important direction for future eWOM research.

Seventh, this study did not consider the influence of individual difference and cultural background on eWOM communication processes. However, individual difference and culture background may play an important role in eWOM communication. For example, previous research has documented that individuals differ in their dispositions to express emotions to others, which is termed as emotional expressivity (Gross and John, 1995; 1997). People high in emotional expressivity convey their emotions more strongly than people low in emotional expressivity. As a result, it is expected that the information flow in eWOM communication for consumers high in emotional expressivity might be different from that of people low in emotional expressivity. Furthermore, it is also expected the communication cues employed may be different for consumers from different cultures, such as individualistic vs. collectivistic and high context vs. low context cultures. For example, consumers from a high context culture might use more indirect cues such as emoticons and indirect phrases than those from low context culture. Thus, the influence of individual differences should be considered in future research, and cross-cultural studies should be conducted in the future to compare the eWOM communication across different cultures.

Eighth, although this study suggested that Automatic Text Analysis may become an effective tool for studying eWOM, and furthermore provided some evidence for the validity of using LIWC indicators in studying eWOM, the word count strategy of LIWC has some limitations (Mehl 2006; Mehl and Gill, 2010). Thus, before generalizing the

method to a wider usage, more research should be conducted to establish its validity and utility in marketing and consumer research. The present study can be considered an important first step in that direction. In addition, more complex approaches of quantitative text analysis exist and their potential for exploring evaluative information contained in eWOM should be explored. For example, Mehl (2006) summarized eight different types of ATA approaches. Some of the other approaches, such as thematic content analysis, general inquirer, and analysis of verbal behavior, may offer unique potential for exploring the textual data of eWOM.

Considering a huge amount of online reviews that have been posted on the web, it is surprising how little this important source of information has been utilized. This is especially true for the textual online review data that so far have been almost entirely neglected. This study calls for more attention to consumer online reviews, especially their textual parts. This study showed eWOM communication process is effective and both star ratings and communication cues contained in the text review are informative. Two most important future research directions for eWOM research are (1) to develop effective tools in capturing the information contained in online reviews and (2) to develop powerful empirical models to better capture relationships between eWOM measures and firms' market performance.

## APPENDIX A

### COMPLETE RESEARCH PROTOCOL

#### 1. Pilot study: focus group

1.1. Purpose: identify distal and proximal cues utilized in eWOM communications

1.2. Participants: 7 undergraduate students for encoding group and 7 undergraduate students for decoding group; recruited from business classes at a major northeastern university

#### 1.3. Procedure

Participant registration

Read disclosure form and learn the research purpose and instruction

Write an online review (encoding group) or read online reviews (decoding group)

Discuss about distal or proximal cues

Closing: The researcher thanks all participants

#### 2. Phase 1 online survey: encoding

2.1 Purpose: examining the encoding process

2.2 Participants: 230 consumers recruited by an online survey research firm

2.3 Data collection method: web-based self-administered survey

#### 2.4 Procedure

Email invitation from an online survey research firm

Read disclosure form and learn the research purpose and instruction

Fill out survey section 1 and 2

Write a online review

Fill out survey section 3, and 4.

3. Phase 2 online survey: decoding

3.1 Purpose: examining the decoding process

3.2 Participants: 155 consumers recruited by an online survey research firm

3.3 Data collection method: web-based self-administered survey

3.4 Procedure

Email invitation from an online survey research firm

Read disclosure form and learn the research purpose and instruction

Fill out survey section 1

Read 3 reviews written by the encoding group

Fill out survey section 2, 3, and 4.

**APPENDIX B**  
**FOCUS GROUP INTERVIEW PROTOCOL**

**Focus Group 1: Encoding Processes (June 23, 2010)**

**1. Introduction and statement of purpose of the focus group**

**2. Introductory question**

Let's start with your personal information. Let's go around the table and tell us your name and use one or two sentence to introduce yourself briefly.

**3. General question about the motivation and intention of eWOM communication**

Please recall what were you thinking and feeling about when you wrote the online review and answer following questions.

3.1 What kinds of information did you intend to deliver to the review readers about the restaurant or bar?

3.2 How effective, do you think, is your online review in communicating your intended information? Or to what extent, do you think, can review readers perceive your intended information accurately?

**4. Communication cues or strategies that consumers use in writing the online review**

Please recall the types of information you employed in writing your online review in order to communicate your intended evaluations and emotions toward the restaurant/ bar and answer following questions.

4.1 What types of information communication that you employed in your online review in order to communicate your evaluations and/or feelings to other consumers? (e.g., how important is each type of information?)

- 4.2 Which characteristics or features of the restaurant/bar, do you think, are important in communicating your intended information? (probe: relative importance)
- 4.3 How do you think about the objective descriptions or factual information related to different aspects of the restaurant/bar's features in order to communicate your evaluations and emotions? (Probe: facts, comparison, and uniqueness).
- 4.4 What is the relative importance of each piece of objective information that you wanted to communicate?
- 4.5 How do you think about the use of emotion words (e.g., happy, sad, and angry) in order to communicate your intended information?
- 4.6 How important are the emotion words?
- 4.7 How do you think about linguistic characteristics such as indirect phrase and metaphor (e.g., "It drove me up the wall"; "I can't believe that they are doing this to me"); emoticons (e.g., smile face, :-), ☺), vocal spelling (e.g., weeeell and y'all), lexical surrogate (e.g. "Uh hum", "hmmm", "yuk yuk" ), and manipulation of grammatical markers (using capital letters, periods, commas, quotation marks, and exclamation marks to indicate pause or express attitude) in conveying your evaluations and emotions in your online review?
- 4.8 How important is each linguistic characteristic?
- 4.9 Is there any other way of information communication that you used in your review to convey your evaluations and emotions besides what we just discussed?

## **5. The comparison between face-to-face WOM and eWOM**

- 5.1 How do you perceive the similarity and difference between face-to-face WOM communication and eWOM communication? (Probe: in which aspect?)
- 5.2 What types of information will you use if you want to communicate the same information in your online review through face-to-face communication?
- 5.3 What is the difference and similarity between the information used in eWOM and the information used in face-to-face WOM communication?
- 5.4 Which channel (eWOM vs. face-to-face WOM) is more effective in terms of communication? What are the reasons?

## **6. Conclusion**

All right, we are close to the end. Before we go I want to ask you if you have any final thoughts or information that you want to add to our discussion today? If you do, now is a good change to share with us.

We appreciate your coming and participating!

Thank you!

## **Focus Group 2: Decoding Process (July 1, 2010)**

### **1. Introduction and statement of purpose of the focus group**

### **2. Introductory question**

Let's start with your personal information. Let's go around the table and tell us your name and use one or two sentence to introduce yourself briefly.

### **3. General questions about perceiving eWOM communication**

Please recall what were you thinking and feeling about when you read the online reviews

and answer following questions.

- 3.1 What kinds of information did you detect or perceive when you read the online reviews? (Probe: evaluations? emotions? attitudes? preference?)
- 3.2 To what extent, do you think, can you accurately detect and infer the information intentionally delivered by the review writers? Or how effective, do you think, are the online reviews in communicating intended information of the review writers?

#### **4. Communication cues or strategies that consumers use in detecting and inferring the information from the online reviews**

Please recall the types of information you employed in order to detect and infer the information delivered by the review writers through the online reviews.

- 4.1 What types of information did you use in detecting and inferring the information delivered by the review writers through online reviews (e.g., how important is each strategy or cue?)
- 4.2 Which characteristics or features of the restaurant/bar are important based on what you read from the online reviews? (probe: relative importance)
- 4.3 How do you think about the objective description or factual information related to different aspects of the restaurant/bars' features in order to detect and infer the evaluations and emotions delivered by the online review writers? (Probe: facts, comparison, and uniqueness).
- 4.4 What is the relative importance of each type of information?
- 4.5 How do you think about the emotion words (e.g., happy, angry, and satisfied) in order to perceive the evaluations and emotions delivered by the review writers?

4.6 How important are the emotion words?

4.7 How do you think about the linguistic characteristics such as indirect phrase and metaphor (e.g., “It drove me up the wall”; “I can’t believe that they are doing this to me”); emoticons (e.g., smile face, :-), ☺), vocal spelling (e.g., weeeell and y'all), lexical surrogate (e.g. “Uh hum”, “hmmm”, “yuk yuk” ), and manipulation of grammatical markers(using capital letters, periods, commas, quotation marks, and exclamation marks to indicate pause or express attitude) in perceiving the information delivered through the online reviews?

4.8 How important is each linguistic characteristics?

4.9 Is there any other way beyond what we just discussed through which you detected the evaluations and emotions delivered through the online reviews?

## **5. The comparison between face-to-face WOM and eWOM**

5.1 How do you perceive the similarity and difference between face-to-face WOM communication and eWOM communication? (Probe: in which aspect?)

5.2 What types of information will you use to detect and infer the evaluations and emotions delivered by the review writers if the same information is delivered through face-to-face communication?

5.3 What is the difference and similarity between the types of information detected in eWOM and the information detected in face-to-face WOM communication?

5.4 Which channel (eWOM vs. face-to-face WOM) is more effective in terms of information communication? What are the reasons?

## **6 Conclusion**

All right, we are close to the end. Before we go I want to ask you if you have any final thoughts or information that you want to add to our discussion today? If you do, now is a good change to share with us.

We appreciate your coming and participating!

Thank you!

**APPENDIX C**  
**QUESTIONNAIRE (PHASE 1)**

Have you had any memorable positive or negative experiences at a local restaurant in the past three months?

- Yes  
 No [Screen Out]

**PART A**

Please answer the following questions about you.

A1. Please check the number that best describes your response as to how you think about restaurants in general.

	Strongly Disagree	Somewhat Disagree	Slightly Disagree	Neither Agree Nor Disagree	Slightly Agree	Somewhat Agree	Strongly Agree
1. In general I have a strong interest in restaurants.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Restaurants are very important to me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Restaurants matter a lot to me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. I get bored when other people talk to me about restaurants.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

A2. please check the number that best describes your current emotion status.

Overall, at present moment, I feel \_\_\_\_\_.

	Not at all	2	3	Moderately	5	6	Very much
1. positive	<input type="radio"/>						
2. negative	<input type="radio"/>						

**PART B**

Please think about the local restaurant you have the most memorable positive or negative experiences with during the past three months and answer the following questions. After these questions we will invite you to write an online review about this restaurant.

B1: What is the name of the restaurant?

B2: In which city is the restaurant located?



B6.1 How likely would you be to patronize the restaurant next time?

<b>Extremely Unlikely</b>	<b>Quite Unlikely</b>	<b>Slightly Unlikely</b>	<b>Neither Unlikely Nor Likely</b>	<b>Slightly Likely</b>	<b>Quite Likely</b>	<b>Extremely Likely</b>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

B6.2 It is \_\_\_\_\_ (impossible/possible) for me to patronize the restaurant next time?

<b>Extremely Impossible</b>	<b>Quite Impossible</b>	<b>Slightly Impossible</b>	<b>Neither Impossible Nor Possible</b>	<b>Slightly Possible</b>	<b>Quite Possible</b>	<b>Extremely Possible</b>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

B6.3 It is \_\_\_\_\_ (improbable/probable) for me to patronize the restaurant next time.

<b>Extremely Improbable</b>	<b>Quite Improbable</b>	<b>Slightly Improbable</b>	<b>Neither Improbable Nor Probable</b>	<b>Slightly Probable</b>	<b>Quite Probable</b>	<b>Extremely Probable</b>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**PART C**

Please recall your experiences with the restaurant you indicated in the last section. Imagine that you are invited by a popular consumer online review forum to write a review about this restaurant. You are told that your review will be posted on its website to help other consumers who visit your city/town with their restaurant choices. Please write your review for this website in the textbox below.

Note: Please write your review between 120 and 300 words. Your review should be NO less than 120 words. Otherwise, you will NOT be able to answer the rest of the questions. As a result:

1. we CANNOT learn from your experiences and
2. you will NOT be qualified for receiving reward points.

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**PART D**

Now think about the information of the restaurant that you wanted to get across to review readers when you wrote the review and answer the following questions.

D1. What is the overall star rating of the restaurant that you wanted to get across to review readers and hoped they can learn from your review?

- 
- 
- 
- 
-









J3. Please indicate to what extent you agree or disagree with the following statements about you.

	Strongly Disagree	Somewhat Disagree	Slightly Disagree	Neither Agree Nor Disagree	Slightly Agree	Somewhat Agree	Strongly Agree
1. I dislike the responsibility of handling a situation that requires a lot of thinking.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. I would rather do something that requires little thought than something that is sure to challenge my thinking abilities.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. I try to anticipate and avoid situations where there is a likely chance I will have to think in depth about something.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Whenever I feel negative emotions, people can easily see exactly what I am feeling.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. People often do not know what I am feeling.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. I laugh out loud when someone tells me a joke that I think is funny.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. When I'm happy, my feelings show.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. My body reacts very strongly to emotional situations.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. No matter how nervous or upset I am, I tend to keep a calm exterior.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. I have strong emotions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. Whenever I feel positive emotions, people can easily see exactly I am feeling.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. There have been times when I have not been able to stop crying even though I tried to stop.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. I experience my emotions very strongly.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. What I'm feeling is written all over my face.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

J4. Your gender is:

- Male  
 Female

J5. Your age is:

- 18 or younger
- 19-24
- 25-29
- 30-34
- 35-44
- 45-54
- 55-64
- 65 or over

J6. Your education is:

- Less than 5th grade
- 5th to 8th grade
- 9th to 12th grade, no diploma
- High school graduate
- Some college credit
- Associate degree
- Bachelor's degree
- Master's degree
- Professional
- Doctorate degree

J7. Your annual family household income is:

- Less than \$25,000
- \$25,000-\$49,999
- \$50,000-\$74,999
- \$75,000-\$99,999
- \$100,000 -\$124,999
- \$125,000 – 150,000
- Over \$150,000

K8. Your ethnicity is:

- White
- African American/Black
- Hispanic/Latina
- Asian/Asian American
- Native American
- Other, please specify





A5. please check the number that best describes your current emotion status

Overall, at present moment, I feel \_\_\_\_\_ .

	Not at all	2	3	Moderately	5	6	Very much
1. positive	<input type="radio"/>						
2. negative	<input type="radio"/>						

A6. Which state (county) do you currently live in? (After choosing your state, please click the "next" button at the end of page in order to proceed)

- Alabama [Skip to 4]
- Alaska [Skip to 5]
- Arizona [Skip to 6]
- Arkansas [Skip to 4]
- California (Los Angeles county) [Skip to 7]
- California (Orange county, Riverside county, and San Bernardino county, and San Diego county) [Skip to 8]
- California (Other counties) [Skip to 9]
- Colorado [Skip to 10]
- Connecticut [Skip to 11]
- Delaware [Skip to 12]
- District of Columbia [Skip to 11]
- Florida (Broward county, Hillsborough county, Miami-Dade county, Orange county, Palm Beach county, and Pinellas county) [Skip to 13]
- Florida (Other counties) [Skip to 14]
- Georgia [Skip to 15]
- Hawaii [Skip to 5]
- Idaho [Skip to 6]
- Illinois [Skip to 16]
- Indiana [Skip to 17]
- Iowa [Skip to 18]
- Kansas [Skip to 11]
- Kentucky [Skip to 18]
- Louisiana [Skip to 5]
- Maine [Skip to 19]
- Maryland [Skip to 20]
- Massachusetts [Skip to 21]
- Michigan [Skip to 22]
- Minnesota [Skip to 23]
- Mississippi [Skip to 20]
- Missouri [Skip to 19]
- Montana [Skip to 17]
- Nebraska [Skip to 23]
- Nevada [Skip to 24]
- New Hampshire [Skip to 10]
- New Jersey [Skip to 25]
- New Mexico [Skip to 21]
- New York (Bronx county, Kings county, Queens county, New York county, and Suffolk county) [Skip to 26]

- New York (Other counties) [Skip to 27]
- North Carolina [Skip to 28]
- North Dakota [Skip to 29]
- Ohio [Skip to 30]
- Oklahoma [Skip to 31]
- Oregon [Skip to 31]
- Pennsylvania [Skip to 32]
- Rhode Island [Skip to 33]
- South Carolina [Skip to 24]
- South Dakota [Skip to 29]
- Tennessee [Skip to 12]
- Texas (Bexar county, Dallas county, Harris county, and Tarrant county) [Skip to 34]
- Texas (Other counties) [Skip to 35]
- Utah [Skip to 29]
- Vermont [Skip to 36]
- Virginia [Skip to 36]
- Washington [Skip to 33]
- West Virginia [Skip to 37]
- Wisconsin [Skip to 37]
- Wyoming [Skip to 19]

**PART B-1**

Imagine that you are going to visit City X and plan to have dinner at a restaurant in that city. You have never been to City X, so you check the Internet for restaurant information. On a consumer online review forum, you found three reviews about three different restaurants. These three reviews are listed in the each of three following sections. Each section includes one review followed by a set of questions about that review.

The section below contains the first review. Please read the review and answer each of the questions about the review.

Review

Star Rating

Text Review









	Not at all	2	3	Moderately	5	6	Very much
8. angry	<input type="radio"/>						
9. irritated	<input type="radio"/>						
10. frustrated	<input type="radio"/>						
11. depressed	<input type="radio"/>						
12. disappointed	<input type="radio"/>						
13. sad	<input type="radio"/>						

G4.1 How likely would you be to patronize the restaurant if you went to City X?

Extremely Unlikely	Quite Unlikely	Slightly Unlikely	Neither Unlikely Nor Likely	Slightly Likely	Quite Likely	Extremely Likely
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

G4.2 It is \_\_\_\_\_ (impossible/possible) for me to patronize the restaurant if I went to City X.

Extremely Impossible	Quite Impossible	Slightly Impossible	Neither Impossible Nor Possible	Slightly Possible	Quite Possible	Extremely Possible
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

G4.3 It is \_\_\_\_\_ (improbable/probable) for me to patronize the restaurant if I went to City X.

Extremely Improbable	Quite Improbable	Slightly Improbable	Neither Improbable Nor Probable	Slightly Probable	Quite Probable	Extremely Probable
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

G5. What is your general attitude toward this type of restaurants?

Extremely Unfavorable	Quite Unfavorable	Slightly Unfavorable	Neither Unfavorable Nor Favorable	Slightly Favorable	Quite Favorable	Extremely Favorable
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Tell us something about yourself.

Your gender is:

- Male
- Female

Your age is:

- 18 or younger
- 19-24
- 25-29
- 30-34
- 35-44
- 45-54
- 55-64
- 65 or over

Your education is:

- Less than 5th grade
- 5th to 8th grade
- 9th to 12th grade, no diploma
- High school graduate
- Some college credit
- Associate degree
- Bachelor's degree
- Master's degree
- Professional
- Doctorate degree

Your annual family household income is:

- Less than \$25,000
- \$25,000-\$49,999
- \$50,000-\$74,999
- \$75,000-\$99,999
- \$100,000 - \$124,999
- \$125,000 – 150,000
- Over \$150,000

Your ethnicity is:

- White
- African American/Black
- Hispanic/Latina
- Asian/Asian American
- Native American
- Other, please specify

## APPENDIX E

## MEASUREMENT TABLE

Construct	Measures	Scale	Source
Star Rating	What is your overall star rating of the restaurant?	1 Star to 5 Star	
Attitudes toward Restaurant	What is your attitude toward the restaurant? (1) bad/good; (2) dislike/like (3) unfavorable/favorable (4) negative/positive	7-point semantic differential scale	Adapted from Holbrook and Batra (1987) and Stafford (1996)
Intended Attitudes toward Restaurant	What is the attitude toward the restaurant that you wanted to get across to review readers and hope they can learn from your review? (1) bad/good; (2) dislike/like (3) unfavorable/favorable (4) negative/positive	7-point semantic differential scale	
Perceived Attitudes toward Restaurant	What do you think is the review author's attitude toward the restaurant? (1) bad/good; (2) dislike/like (3) unfavorable/favorable (4) negative/positive	7-point semantic differential scale	
Emotional States toward the Restaurant	Your experiences with this restaurant made you feel_____. (1) Overall positive (2) Overall negative (3) Happy (4) Delighted (5) Satisfied (6) Excited (7) Mad (8) Angry (9) Irritated (10) Frustrated (11) Depressed (12) Disappointed (13) Sad	7-point Likert scale 1(Not at all) to 7 (Very much)	Adapted from Bagozzi, Baumgartner, and Pieters (1998), Olney, Holbrook, and Batra (1991), and Chaudhuri and Buck (1995)

Construct	Measures	Scale	Source
Intended Emotional States toward the Restaurant	When you wrote the review, to what extent did you want to get across the following emotions toward the restaurant to review readers? (1) Overall positive (2) Overall negative (3) Happy (4) Delighted (5) Satisfied (6) Excited (7) Mad (8) Angry (9) Irritated (10) Frustrated (11) Depressed (12) Disappointed (13) Sad	7-point Likert scale 1(Not at all) to 7 (Very much)	
Perceived Emotional States toward the Restaurant	To what extent did the online review author express the following emotions toward the restaurant in the review? (1)Overall positive (2)Overall negative (3) Happy (4) Delighted (5) Satisfied (6) Excited (7) Mad (8) Angry (9) Irritated (10) Frustrated (11) Depressed (12) Disappointed (13) Sad	7-point Likert scale 1(Not at all) to 7 (Very much)	
Future Patronage Intentions	How likely you would like to patronage the restaurant next time? (1) possible/impossible (2) likely/unlikely (3) probable/improbable	7-point semantic differential scale	Adapted from Gotlieb and Sarel (1991) and Yi (1990)

Construct	Measures	Scale	Source
Distal Content Cues	Please indicate to what extent you communicated the information about each of the following aspects of the restaurant in your review. (1) Food and drink (e.g. food taste, hygiene, and drink selections) (2) Service (e.g., speediness and friendliness) (3) Environment (e.g., layout, furnishing, and cleanness) (4) Price or value (5) Location (e.g., distance, traffic, and parking) (6) Prestige and reputation	7-point Likert scale 1(Not at all) and to 7 (Very much)	Adapted from Resnik and Stern (1977)
Proximal Content Cues	Please indicate to what extent the review communicated to you about each of the following aspects of the restaurant (1) Food and drink (e.g. food taste, hygiene, and drink selections) (2) Service (e.g., speediness and friendliness) (3) Environment (e.g., layout, furnishing, and cleanness) (4) Price or value (5) Location (e.g., distance, traffic, and parking) (6) Prestige and reputation	7-point Likert scale 1(Not at all) and to 7 (Very much)	Adapted from Resnik and Stern (1977)
Distal Verbal Cues	Please indicate to what extent you used each of the following types of words in your review. (1) Positive emotion words (words such as "good", "enjoyable", and "best" that reflect your positive emotions) (2) Negative emotion words (words such as "angry", "disappointed", and "worthless" that reflect your negative emotions) (3) Words such as "so", "very", and "really" that express high intensity of your emotions or feelings (4) Words such as "little", "less", and "few" that show low intensity of your emotions or feelings (5) Words such as "maybe", "probably", and "likely" that reflect your uncertainty (6) Indirect phrases (statements that do not contain emotion words but from which others could infer a positive or negative emotional states, e.g., "I can't believe that they are doing this to me", "I want to thank him a thousand times", and "The food is out of this world")	7-point Likert scale: 1 (Did not use at all) to 7 (Made extensive)	Adapted from Boonthanom (2004)

Construct	Measures	Scale	Source
Proximal Verbal Cues	<p>Please indicate to what extent the review author used each of the following types of words in the review.</p> <p>(1) Positive emotion words (words such as "good", "enjoyable", and "best" that reflect your positive emotions)</p> <p>(2) Negative emotion words (words such as "angry", "disappointed", and "worthless" that reflect your negative emotions)</p> <p>(3) Words such as "so", "very", and "really" that express high intensity of your emotions or feelings</p> <p>(4) Words such as "little", "less", and "few" that show low intensity of your emotions or feelings</p> <p>(5) Words such as "maybe", "probably", and "likely" that reflect your uncertainty</p> <p>(6) Indirect phrases (statements that do not contain emotion words but from which others could infer a positive or negative emotional states, e.g., "I can't believe that they are doing this to me", "I want to thank him a thousand times", and "The food is out of this world")</p>	7-point Likert scale: 1 (Did not use at all) to 7 (Made extensive)	Adapted from Boonthanom (2004)
Distal Non-Verbal Cues	<p>Please indicate to what extent you used each of the following linguistic characteristics in your review.</p> <p>(1) Word spellings that imitate vocal communication (e.g., "mmmm....", "weeeell", "Yummm", "y'all", "Uh hum", "hmmm", and "yuk yuk") to catch attention or describe "tone of voice"</p> <p>(2) Pictures (emoticons), such as :-) and :-(.</p> <p>(3) Manipulated grammatical markers, such as CAPITAL letters, quotation marks, and exclamation marks (e.g., The food TOO BAD; Why did this happen???!; It is terrible!!!)</p> <p>(4) To what extent did you properly use paragraphing and capitalization and check misspellings or typos to ensure a good reading quality of your review?</p>	7-point Likert scale: 1 (Did not use at all) to 7 (Made extensive)	Adapted from Boonthanom, Carey (1980) and (2004)

Construct	Measures	Scale	Source
Proximal Non-Verbal Cues	<p>Please indicate to what extent the author used each of the following linguistic characteristics in the review.</p> <p>(1) Word spellings that imitate vocal communication (e.g., "mmmmm...", "weeeeell", "Yummm", "y'all", "Uh hum", "hmmm", and "yuk yuk") to catch attention or describe "tone of voice"</p> <p>(2) Pictures (emoticons), such as :- ) and :- (.</p> <p>(3) Manipulated grammatical markers, such as CAPITAL letters, quotation marks, and exclamation marks (e.g., The food TOO BAD; Why did this happen???!; It is terrible!!!)</p> <p>(4) Based on your perception, to what extent does this review lack certain elements found in normal writing such as paragraphs, capitalization, etc.? Also indicate whether you think there are misspellings or typographical errors in the review.</p>	7-point Likert scale: 1 (Not at all) to 7 (Very much)	Adapted from Boonthanom, (2004) and Carey (1980)

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