Dimensions of lodging guest satisfaction among guests with mobility challenges: A mixed-method analysis of web-based texts

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HIGHLIGHTS

- Integrate mixed-method web content analysis with Penalty-Reward Contrast Analysis.
- A strategic order of lodging service development to optimize customer satisfaction.
- Capture tourists' lodging service evaluation with improved accuracy and reliability.
- A thorough and efficient exploitation of customer-generated web textual data.

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ABSTRACT

Given that many lodging businesses cannot afford to provide satisfactory services to people with mobility challenges, this study recommends a strategic order of service attribute development to maximize customer satisfaction with minimal costs. The crucial lodging service attributes of this population are identified and distinguished by degrees of influence on customer satisfaction based on the analyses of 543 web travel reviews. The results suggests prioritizing the bottom-line delivery of basic and performance factors (i.e. *room access* and *staff attitude capability*), whereas optionally offering the delivery of excitement factors or above-and-beyond delivery of performance factors, such as *luggage and equipment support* and *general lodging features*. Being the first attempt to integrate quantitative and qualitative web content analysis with Penalty-Reward Contrast Analysis, this study captures the real-life tourist service evaluation criteria with improved accuracy and reliability. It also enables a thorough and efficient exploitation of customer-generated web textual data.

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1. Introduction

In recent decades, scholars have highlighted the importance of serving the fast-growing leisure travel market of people with mobility challenges, which also includes a considerable proportion of the mature market (Darcy, 2010; Eichhorn, Miller, & Tribe, 2013; McKercher, Packer, Yau, & Lam, 2003; Metz, 2000). Efforts to better understand and improve the travel experience for people with mobility challenges can help tourism and hospitality businesses maintain this loyal tourist market as well as the tourists' support networks (Stumbo & Pegg, 2005). Besides, it is ethically righteous

to facilitate travel opportunities for people with mobility challenges, as travel as a basic human right should be satisfied equally across different populations (Cole & Morgan, 2010).

Researchers have agreed on the crucial role that hospitality service environment plays in enabling/disabling travelers with mobility challenges (Poria, Reichel, & Brandt, 2011; Yau, McKercher, & Packer, 2004). They have accordingly advocated for building the proper facility and service settings to remove the mobility challenges for this population in order to encourage increased travel behaviors (Papamichail, 2012). Regardless of the benefits from implementing the recommended facility and service settings, a large proportion of hospitality businesses cannot apply them all, as this requires significant investments of both time and finances (Burnett & Baker, 2001; Rice, 2006). The findings from the Opening Doors 2002 market study show that, with 100 percent of

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interviewed managers realizing the great market potential as a compensation for their facility and service implementation costs, only 20 percent planned improvements in the near future (Open Doors Organization, 2002). A follow-up study in 2005 further revealed the unfortunate fact that 60 percent of travelers with disabilities with overnight hospitality experiences reported problems including physical barriers, or customer service and communication issues (Open Doors Organization, 2005). Also, hundreds of complaints have been filed to the U.S. Department of Justice, not to mention unofficial complaints through various business websites or social networks. Rice (2006) provided a possible explanation for the customer dissatisfaction, noting that few hospitality managers interviewed in his study demonstrated interest in developing accessible facility and service settings beyond the mandatory building code requirements.

It is understandable that many businesses lack sufficient resources and budget to implement all the desirable service attributes at once for people with mobility challenges. Yet in order to satisfy this travel market to some degree, even if some service attributes cannot be fully implemented yet, hospitality businesses should implement service attributes strategically by prioritizing the implementation of the most influential attributes for customer satisfaction. Such strategic development of service attributes can also maximize investment returns for hospitality businesses. The orderly service development is hence necessary for the mutual benefit of the clients and the hospitality businesses.

In order to identify the strategic order of attribute implementations that can maximize customer satisfaction, the current study uses the Kano Model or *three-factor theory* of customer satisfaction as the conceptual framework (Kano, Seraku, Takahashi, & Tsuji, 1984), which has been widely utilized across various service fields to identify the most influential service attributes to satisfactory consumption experiences (Busacca & Padula, 2005; K. Matzler & Sauerwein, 2002). The theory identified three categories of service attributes, that of basic, performance, and excitement factors. The basic factor reflects fundamental needs of customers and is most responsible for customer *dissatisfaction*. The performance factor contributes to both *dissatisfaction* and *satisfaction* equally. The excitement factor is the unexpected extra value for customers and contributes the most to customer *satisfaction*. Given such attribute categorization, the most influential service attributes for customer satisfaction can be identified based on the commonly acknowledged principle that, the avoidance of dissatisfaction should be prioritized as compared to adding satisfaction. Furthermore, the service attributes that enhance/reduce the overall customer satisfaction the most should be prioritized as well.

There are many applications of the three-factor theory in tourism settings that reveal the service determinants of tourist satisfaction with a destination (i.e., Albayrak & Caber, 2013; Alegre & Garau, 2011; Krešić, Mikulić, & Milicević, 2012), with recreational experiences such as skiing, theme park visits, and animation program experiences (Füller & Matzler, 2008; Mikulic & Prebežac, 2011), or with convention experience (Krešić et al., 2012). For instance, applying three-factor theory, Krešić et al. (2012) found that excellent performance in tourism facilities, human factors and safety measures contribute the most to tourist satisfaction with destinations, whereas poor performance of transportation infrastructure, information quality, and hygiene-related attributes would reduce tourist satisfaction the most. Despite the richness of three-factor theory explorations on tourists in general, the promising market of people with mobility challenges has not yet been adequately explored. Considering the practical significance of the tourist market in relation to mobility challenges as addressed earlier, this study applies the three-factor theory specifically among this market segment to identify the strategic order of lodging service attribute implementation.

Methodologically, one of the most popular approaches to identifying the three-factor structure is Penalty-Reward Contrast Analysis (PRCA). This approach uses multiple regressions to identify the three-factor structure of service attributes by comparing a service attribute's magnitude of influence on customer satisfaction in regards to a well-performed condition (the reward) versus a poorly performed condition (the penalty) (Brandt, 1987). Being empirically verified as a competitively accurate and reliable approach, PRCA is adopted in the current study to capture the process of real-life service evaluation by customers with mobility challenges. Most importantly, the current study extends the application of PRCA to analyzing web-based travel review data, which presumably improves the accuracy of PRCA given the lack of interference with the data generation. This study also contributes to the full exploitation of the rich source of web textual data, which has great potential yet has been analyzed in-depth to identify service-satisfaction relationships.

The introduction of web-based travel reviews into PRCA is done through a mixed-method content analysis, which involves both quantitative and qualitative content analyses. In the quantitative content analysis, the lodging *service details* that most concern people with mobility challenges are initially identified from among the most frequently mentioned relevant words in the reviews. The occurrence frequency of these popular service details are then factor-analyzed into *service attributes*, which are further interpreted with the qualitative content analysis for verification and supplementation of details. Around those service attributes, all the travel reviews were coded for valence of each attribute being mentioned (positive/neutral/negative) as well as valence of the overall service experience. In each review, the attribute valence ratings represent the customer's ratings of different attributes' performances, while the valence rating on overall service experience represents the customer's overall service satisfaction. Consequently, the PRCA analyzes the relationship between attribute performance ratings and the overall customer satisfaction, and identifies the respective and relative influences of different service attributes on customer satisfaction versus dissatisfaction. Premised on the PRCA results, service attributes are then categorized by their varied contribution to customer satisfaction and serve as the basis for a recommended strategic order for lodging businesses to implement service attributes that can maximize satisfaction of customers with mobility challenges.

2. Literature review

2.1. Three-factor theory of customer satisfaction and identification approaches

Researchers have attempted to identify the relationships between service attribute performance and customer satisfaction for decades. One assumption has been that the performance levels of service attributes linearly affect overall customer satisfaction (Mittal & Baldasare, 1995). Another school of scholars nevertheless claimed that the relationships between attribute performance and customer satisfaction may be asymmetric and that, the extent of satisfaction increase due to positive attribute performances may be different from the extent of satisfaction decrease resulting from negative attribute performances (Johnston, 1995; K. Matzler & Sauerwein, 2002). In support of both assumptions, Kano et al. (1984) identified three types of service attributes that indicate three types of attribute-satisfaction relationships, including both asymmetric and symmetric relationships. Such service attributes categorization has thus been known as the Kano Model or three-factor theory.

According to Kano et al. (1984), the *basic factor* contains the service attributes that are minimum requirements identified by customers, so fulfillment of these attributes does not enhance customers' satisfaction much, yet failing to fulfill them generates a high level of dissatisfaction. *Performance factor* includes service attributes wherein the attribute performances have linear relationships with customer satisfaction, where the satisfaction level increases as these attributes are fulfilled and reduces when they are not. The *excitement factor* summarizes service attributes that are value-enhancing requirements or desires of customers, which increase overall satisfaction levels when they are fulfilled but do not cause much dissatisfaction when they are not. For example, Kano et al. (1984) asked customers to rate their satisfaction with each service attributes on a five-point Likert scale ranging from extremely unsatisfied to extremely satisfied if the attribute works poorly or well. Kano and his colleagues then cross-tabulated the number of customers rating each satisfaction category under the poor attribute performance with the number under the good attribute performance. The performance-satisfaction cell with the highest frequency of customers was thus found to determine whether a service attribute belongs to basic factor, performance factor, or excitement factor.

Alternative factor typologies also exist to capture the asymmetric service-satisfaction relationships. For instance, Herzberg, Mausner, and Snyderman (1959) proposed a two-factor typology which captures the asymmetric service-satisfaction relationships with hygiene and motivation factors (similar to basic and excitement factors). Despite the wide applications of such typology among tourism studies (Crompton, 2003; Lundberg, Gudmundson, & Andersson, 2009; Matzler & Renzl, 2007), the symmetric service-satisfaction relationship is also of practical significance to service providers, yet is missing in this dual-factor typology. Therefore, the three-factor satisfaction structure proposed by Kano (1984) that complements the dual-factor typology with the *performance factor* (capturing the symmetric service-satisfaction relationship) addresses the above concern and thereby gains a leading popularity since 90s (Füller & Matzler, 2008; Vavra, 1997). Similarly, Cadotte and Turgeon (1988) proposed a four-factor typology of service attributes, which not only include the three factors of dissatisfiers, criticals, and satisfiers that assemble to basic factor, performance factor, and excitement factor, but also introduces a new factor, *neutrals*, which indicates the service attributes that do not have much influence on either the customer satisfaction or dissatisfaction. Yet as the service attributes that matter to customer satisfaction are generally of the greatest interest to service management, the three-factor theory (without the *neutrals* factor) appears to be dominant in the studies of customer satisfaction (Ahmad, Dey, & Halawani, 2012; Nilsson-Witell & Fundin, 2005; Riviere, Monrozier, Rogeaux, Pages, & Saporta, 2006; Slevitch & Oh, 2010).

The three-factor theory has been validated by many empirical studies across various contexts and service categories, using various research approaches (i.e., Deng, Kuo & Chen, 2008; Johnston, 1995; Johnson and Gustafsson, 2006; Matzler & Sauerwein, 2002). One popular approach is the critical incident technique (CIT) (Backhaus & Bauer, 2001; Johnston, 1995) which identifies basic and excitement factors based on comparison of the frequencies for each service attribute to be mentioned as dissatisfied versus satisfied. The more mentions expressing satisfaction suggest an excitement factor, and otherwise a basic factor. This approach is nevertheless argued as having failed to adopt a holistic perspective in evaluating the service-satisfaction relationships. As the service attributes contribute to customers' satisfaction as a whole, the extent to which a service attribute influences the overall customer satisfaction ought to be determined relative to other service attributes' performances and importance. Researchers have therefore called for alternative approaches to identify the three-factor service structure of satisfaction within a holistic perspective instead of categorizing each service attribute in isolation based on frequency. Such alternative approaches include the importance grid and PRCA.

The importance grid identifies the three-factor structure by comparing customers' identification of a service attribute's explicit importance with its implicit importance, which is a coefficient derived from the multiple regression of overall satisfaction on all attributes' rated performances on a five-point Likert scale (Homburg & Werner, 1998; Vavra, 1997). The attributes with more explicit importance than implicit importance are basic factors, while more implicit importance than explicit importance identifies excitement factors. The performance attributes are those wherein the explicit and implicit importance coincide. Despite the popularity of this approach, it is nevertheless identified by some scholars as being less reliable and valid than the PRCA approach (i.e., Anderson & Mittal, 2000; Busacca & Padula, 2005; Matzler & Sauerwein, 2002).

Penalty-Reward Contrast Analysis, a regression analysis with dummy variables, is the identification approach adopted in the current study (Anderson & Mittal, 2000; Brandt, 1987; Mittal et al., 1998). In its common applications, the customer's rating on a five-point overall satisfaction (OS) scale is the dependent variable, and for each of the service attributes, two dummy variables are defined as independent variables. One dummy variable (X_{j-}) indicates whether the attribute j is poorly performed ($X_{j-} = 1$) or not ($X_{j-} = 0$), whereas the other (X_{j+}) suggests whether attribute j is well performed ($X_{j+} = 1$) or not ($X_{j+} = 0$). The dummy variables are coded from customers' ratings of attribute performances on a five-point Likert scale, where a rating above three is coded as good performance and below three is coded as poor performance. The multiple regression equation is as follows (with a_0 as constant and e as error):

$$\text{Overall Satisfaction(OS)} = a_0 + \sum \left(\beta_+ X_{j+} + \beta_- X_{j-} \right) + e$$

With the multiple regression analysis being conducted, the coefficient magnitude for each attribute's poor-performance dummy variable ($|\beta_-|$, indicating the "penalty" that is subtracted from the overall satisfaction) is compared with the coefficient magnitude for the same attribute's good-performance dummy variable ($|\beta_+|$, indicating the "reward" that is an incremental increase to the overall satisfaction). When $|\beta_-|$ is significantly larger than $|\beta_+|$, the service attribute is classified as a basic factor and is thus given a greater reduction of OS because of its poor performance than the increase of OS due to its good performance. When $|\beta_+|$ is nevertheless larger than $|\beta_-|$, the attribute can be classified as an excitement factor, as its good performance causes more OS increases than the amount of OS decreases by its poor performance. Lastly, when the two coefficient magnitudes of an attribute are insignificantly different, it suggests a symmetric relationship between the attribute performance and OS and results in a performance factor classification. For instance, Alegre and Garau (2011) identified the three-factor structure for tourists visiting "sun and sand destinations" with PRCA, such as when poor scenery reduces tourist satisfaction to an extent ($|\beta_-|$) that is significantly larger than the increase of satisfaction ($|\beta_+|$) due to a beautiful scenery, where the "scenery" attribute of the destination is then identified as a basic factor.

Researchers have conducted studies to compare the various three-factor identification approaches. Matzler and Sauerwein (2002) compared the identification validity between PRCA and the importance grid measurement, the two most-adopted

approaches, and concluded that PRCA has higher diagnostic value than importance grid measures, of which the validity is still questionable. Busacca and Padula (2005) further conducted a convergent validity test between the same two approaches, from which they identified PRCA as a superior approach in terms of reliability.

In summary, PRCA not only addresses the lack of holistic perspective in evaluating service attributes as in critical incident technique (CIT), it is also superior to the importance grid measure because of its well-demonstrated reliability and validity under different settings (i.e., Anderson & Mittal, 2000; Busacca & Padula, 2005; Matzler & Sauerwein, 2002). The current study hence adopts PRCA to identify the three-factor structure of lodging satisfaction among people with mobility challenges. Beyond applying PRCA in a different setting, the current study also proposes an extension to the PRCA application by generating its independent variable list — the influential service attributes of customer satisfaction — from the fresh textual data instead of following the theory-defined attribute list, as in the popular scale measure adopted in most PRCA analyses. Such extension should better capture the real-life mechanisms of customer evaluating services. In reality, not every attribute listed in the theory-defined attribute scales would be necessarily evaluated in each service setting; plus, there may be new attributes emerging in a specific service setting that are still missing from the existing theories. Such variation of real-life service evaluation from established theories cannot be captured by standardized scale measures (Hookway, 2008) and thereby calls for the extraction of attributes from customers' spontaneous descriptions of their service experiences, which helps in identifying the attributes that customers actually evaluated within a specific service setting (Stepchenkova & Morrison, 2008). Such "natural" data of service evaluation is presumably more accurate than PRCA's traditional scale measure, as the latter's artificially designed scale measure carries the risk of inducing customers to evaluate the attributes in pre-designed directions as compared to their real-life service evaluation experiences (Hookway, 2008). The extended PRCA version is also data-driven in nature and thereby allows discovery of new service attributes and possible additions to the existing body of theory about service evaluations (Daugherty, Eastin, & Bright, 2008; Stepchenkova, Kirilenko, & Morrison, 2009). Given these considerations, the extraction of service attributes from online tourist-generated texts is proposed in this study as an extension of the PRCA application to better reflect the real-life lodging evaluation procedures by people with mobility challenges.

2.2. Customer-generated web content as data in tourism studies

With the upsurge of online social networking, the information generated and shared by tourists regarding their travel experiences, called Electronic Word of Mouth (eWOM), has increasingly important influences on travel decision making by web audiences (Pan, MacLaurin, & Crotts, 2007; Wenger, 2008; Xiang & Gretzel, 2010). This third-party perspective is often perceived as more trustworthy than the marketing campaigns initiated by industry (Mack, Blose, & Pan, 2008). Moreover, it is written from a tourist's perspective and thus provides an indirect and vivid travel experience for the audience (Bickart & Schindler, 2001).

The eWOM often comes in the form of customer reviews and ratings (Gretzel & Yoo, 2008). The 2013 Travel Weekly Consumer Trends Survey conducted by Warren Weiss Co. revealed that, 58 percent of the respondents routinely seek out opinions of other tourists via travel review sites, as compared to the number of about 50 percent for the previous year (Travel Weekly, 2013). USTA statistics show that more than 157 million American domestic trips in 2012 were planned using destination websites, 141 million were planned using travel service providers' websites (airline, hotel,

rental car, cruise, tours, etc.), and 75 million were planned using social networking (US Travel Association, 2013). Consequently, as a growing source of travel market influence, consumer creation, sharing, and use of online travel information for trip planning has drawn much attention of both businesses and researchers (Bonn, Furr, & Susskind, 1999; MacKay, McVetty, & Vogt, 2005).

For tourism businesses, as compared to traditionally exhaustive market investigations, the freely accessible eWOMs provide a budget- and time-efficient channel for understanding the demands and expectations of the tourist market (Carson, 2008; Litvin, Goldsmith, & Pan, 2008; Pan et al., 2007; Wenger, 2008). Such knowledge thus guides businesses' future practices of service promotion and delivery. The online content generated by tourists is also widely favored by tourism researchers, as it provides immediately available information that is also "uncontaminated" by researchers during data creation and collection (Hookway, 2008). eWOM has thus been recognized as a natural setting for study of travelers' lived experiences. Notably, Hookway (2008) described people sharing online information as "masked social actors" who "may be relatively unselfconscious about what they write since they remain hidden from view" (p. 96).

Given the relative advantages of eWOM over other sources of data, and the increasing attention to the detailed information enclosed in textual eWOM, such employment of online travel reviews has flourished in a variety of tourism arenas (Cantallops & Salvi, 2014). Tourism researchers have investigated the behaviors and influences of writing, reading, and sharing online travel reviews, where a series of topics include the potential influence of online travel reviews on audiences' travel intention and perception of travel services (Ayeh, Au, & Law, 2013; Hernández-Méndez, Muñoz-Leiva, & Sánchez-Fernández, 2013; Mauri & Minazzi, 2013), travelers' motivation to write and share travel reviews (Boo & Kim, 2013; Jeong & Jang, 2011; Yoo & Gretzel, 2008), as well as quality evaluation of travel reviews and information searching approaches to filter useful information for trip planning (Loureiro & Kastenholz, 2011; O'Connor, 2008; Yacouel & Fleischer, 2012; Ye, Zhang, & Law, 2009).

Another important branch of studies primarily addresses the contents of online travel reviews and useful tourist information that can be extracted to directly benefit tourism businesses (Capriello, Mason, Davis, & Crotts, 2013; Echtner & Ritchie, 2003; Levy, Duan, & Boo, 2013; Tasci, Gartner, & Cavusgil, 2007). A large proportion of such studies aim at destination image investigation, with attempts to understand tourists' perceptions about a destination based on the words they frequently use (Dioko, Harrill, & Son, 2011; Pan et al., 2007; Stepchenkova & Zhan, 2013). Another major investigation into the contents of web travel reviews is identifying the travel service attributes as determinants of customer satisfaction, in order to guide travel service design and management (Au, Buhalis, & Law, 2014; Ekiz, Khoo-Lattimore, & Memarzadeh, 2012; Lehto, Park, Park, & Lehto, 2007; Zhang & Mao, 2012). For instance, Zhang and Mao (2012) identified from customers' web reviews on US major brand hotels that hotel room condition, location, and staff are the primary hotel image attributes that determine customer loyalty. Magnini, Crotts, and Zehrer (2011) found that the most frequently mentioned service attributes in customers' expressions of a positive lodging experience are customer services and hotel cleanness. Lelto et al. (2007) also investigated the online travel reviews based on frequency counts and identified the features of virtual travel firms such as "customer service and support" and "firm credibility" as contributors to customer satisfaction.

Zhang, Ye, Song, and Liu (2015) made further progress with a cruise study by not only identifying the most influential cruise service attributes for tourist satisfaction, but also distinguishing the

service attributes that only contribute to tourist satisfaction (satisfiers), the attributes that only contribute to tourist dissatisfaction (dissatisfiers), and those that contribute to both satisfaction and dissatisfaction (hybrid factors). Their findings intended to help cruise businesses to make informed decisions about what service attributes need to be strengthened as their priority. The classification is concluded from the regression analysis of tourists' cruise satisfaction scale ratings on their cruise service evaluation ratings, collected from a cruise guide website. Lu and Stepchenkova (2012) also identified the various relationships between travel service delivery and customer satisfaction, yet their service-satisfaction relationship identification was based on textual web reviews, which are a more readily available and natural data source than customers' numerical ratings. They qualitatively analyzed the eco-tourists' textual web reviews about their eco-lodge experiences as posted on TripAdvisor. The comments were subjectively coded by authors into 26 eco-lodge attributes, and under each attribute the comments were further grouped into favorable comments, unfavorable comments, or no comments. Then the five-point Likert scale measure of eco-lodge overall satisfaction was compared between the three comment groups for statistical differences. For instance, if a statistical significance in lodge satisfaction is found between the *favorable* and *no comment* group but not between the *unfavorable* and *no comment* group, then that service attribute is identified as a satisfier; if the statistical significance is only found between the *unfavorable* and *no comment* group, then the attribute is a dissatisfier; nevertheless, if the significant differences are found in both, then it is a critical (or basic) factor. Their study contributed to the field by adopting the web textual data in the hospitality research of service-satisfaction relationships, yet its classification again approach lacks the holistic perspective of PRCA, as it still evaluated each service attribute independently as opposed to evaluating all the service attributes as an entity and considering their comparative contribution to customer satisfaction. To enhance the accuracy of identifying service-satisfaction relationships from textual eWOM, the joint application of web textual content analysis and PRCA is a promising approach to be explored. The current study is thereby conducted in correspondence to the demand for further explorations to extract rich service-satisfaction information from textual eWOMs, and the need of more accurate approaches to analyze such information.

Besides the methodological significance of extracting rich and accurate service-satisfaction data from the textual eWOMs, eWOMs are also analyzed in the current study because of their practical significance to understanding the travel market with mobility challenges. People with mobility challenges have embraced the internet as an empowering source of information, allowing them to independently plan their trips (Buhalis, 2003; Ray & Ryder, 2003). This population can easily obtain online detailed and up-to-date travel information, exchange travel experiences with other people with mobility challenges, as well as deliver information on their personal accessibility needs to the service provider. Ray and Ryder (2003), in studying tourists with mobility challenges, identified the internet as the second most-adopted information source, with word-of-mouth by acquaintances being the first source. Consequently, internet-based travel reviews and communications by the people with mobility challenges should be treated as a crucial knowledge base for hospitality businesses and destinations so that they can receive timely customer feedback and develop corresponding strategies for service improvements.

2.3. Content analysis of tourism web data

Considering the complexity of analysis and the enormous quantity of textual eWOMs, a combination of quantitative and qualitative content analyses is proposed as an effective approach to extract the travel service attributes that concern customers the most. Content analysis has been a well-established research method for analyzing the textual data since the early 1920s (Holsti, 1969). It has been widely applied across social science fields, and has increasingly gained popularity given the demand for interpreting the fast-growing web communications (Banyai, 2012; Romano, Donovan, Chen, & Nunamaker, 2003). Content analysis of tourists' blogs and forum communications in tourism studies (quantitative or qualitative) has been primarily employed to capture tourists' perception about travel service quality or destination image (i.e., Choi, Lehto, & Morrison, 2007; Pan et al., 2007; Stepchenkova et al., 2009; Zhang & Mao, 2012; Zhang et al., 2015).

Quantitative content analysis generally summarizes tourists' perception of travel services or destinations through quantifying tourists' texts by using word occurrence frequency, whereas those keywords with top occurrence frequencies are associated by co-occurrence and with their factor-analyzed frequencies (Govers, Go, & Kumar, 2007; Lehto et al., 2007; Stepchenkova & Morrison, 2006; Zhang & Mao, 2012). This word-count approach extracts concepts of interest from textual data in a relatively objective way as opposed to the subjective thematic analysis, which primarily replies on the scholars' judgments. Despite its ease in analyzing a huge pool of textual data and the generalizability of its conclusions, however, it has been criticized as providing a vague reflection of tourist perceptions. Arguments for this view are that it oversimplifies tourists' subjectively described experiences with word counts and ignores the valuable contextual and affective information embedded in the textual data (Hookway, 2008; Neuendorf, 2002).

Alternatively, the qualitative approach, that of narrative analysis, has been adopted by researchers to conceptualize not only tourists' perceptions of but also their affection for travel services or a destination (Dioko et al., 2011; Gong et al., 2015; Lu & Stepchenkova, 2012; Tussyadiah & Fesenmaier, 2009; Wenger, 2008). In this approach, travel experiences described by tourists are deconstructed into quotations that are full of individualized details and subjective feelings. The researchers further interpret from the quotations how individual tourists assign meanings to their experiences and how these meanings vary within different contexts. Based on existing theories and researchers' interpretation, the quotations are often coded into themes that feature the major issues that travel businesses or destinations ought to address. The qualitative approach fully embraces the interpretive nature of tourists' experiences and fully accounts for contextual variation (Banyai & Havitz, 2013; Duriau & Reger, 2004). Its pitfalls nevertheless include the extensive effort involved and time-consuming nature of large-scope data analysis, which inherently carry more subjective bias than the quantitative approach given the uncertainty about whose perspectives are being adopted when interpreting the data (Banyai & Glover, 2012; Stepchenkova & Morrison, 2008). A rising trend is thus to adopt the mixed-method approach that combines the structured quantitative methods with unstructured qualitative methods in order to capture different and broader components of the web-recorded tourists' experiences (Baloglu & Mangaloglu, 2001; Banyai & Havitz, 2013; Choi, Chan, & Wu, 1999).

The mixed-method content analysis is hence adopted in the current study for the following reasons. First of all, the identification of service attributes from textual data is inherently too complex to adopt the quantitative content analysis alone, which has been the more popular approach among destination image identification studies. The quantitative content analysis of destination reviews normally generate key words that can exclusively represent a specific tourism attraction and thereby usually become straightforward for factor analysis and interpretation, such as

"heritage," "palaces," "music," and "food." The service attribute identification on the other hand involves more complexity. Many key words in service settings portray different service attributes under different contexts. For example, the key word "lift" may represent a pool lift, bed lift, or simply a variant for elevator. Hence after the quantitative factor analysis summarizes the significant service attributes, a qualitative in-text interpretation of the frequent key words that comprise each service attribute is necessary to confirm the meaningful concurrence of key words. Another reason for adopting mixed-method content analyses herein is the need to interpret both generic service attributes and concrete service details summarized by those attributes. The generic attribute extraction is primarily used to simplify the web textual data for a structured understanding of customer service needs. The generic attributes are also the bases for conducting the statistical analysis to better understand the relationships between attribute performances and customer satisfaction. Despite the beauty of this simplified data structure, the interpretation of enclosed concrete service details in each service attribute can provide practical guidance for lodging businesses to identify specific services to be addressed.

In order to unravel the above-mentioned complexities and provide meaningful and practical guidance to lodging businesses, the qualitative in-text interpretation is adopted in the current study as a supplement to the traditional quantitative word counts and factor analysis. After the travel reviews on lodging experiences are quantitatively reduced into interpretable service attributes, which are also the independent variables for the forthcoming PRCA analysis, the concrete details enclosed in each attribute across different service settings are qualitatively interpreted in the texts to further verify the quantitatively identified attribute categories, and also provide sufficient details for guiding lodging service management practices (Krippendorff, 2004). For instance, through factor analysis a service attribute "shower accessibility" could be identified from the frequent words "roll," "tub," "shower," and "seat." In order to understand the specific meanings of the above key words under different service contexts, allowing concrete service details to embody the abstract attribute "shower accessibility," a qualitative analysis interprets the frequent words in texts throughout all the reviews. For example, the qualitative analysis would identify that "shower accessibility" involves "roll"-in shower availability, available shower "seat" and adequate handles if only a "tub" is available, and a hand-held "shower." These qualitatively identified service details can thereby help practitioners understand the specific service accommodations that are still in demand or where they already did a good job in providing them. Later on a PRCA analysis regressing the overall lodging satisfaction on performance ratings of "shower accessibility" and other identified attributes could determine what role "shower accessibility" plays as compared to other service attributes in contributing to lodging satisfaction/dissatisfaction among customers with mobility challenges.

3. Empirical analysis

The study data analyzed with both quantitative and qualitative content analyses include 543 valid travel reviews about lodging services by people with mobility challenges from four of the most popular hospitality web forums this population visits: www.tripadvisor.com (171 reviews), www.flyertalk.com (143 reviews), www.apparelyzed.com (126 reviews), and www.lonelyplanet.com (103 reviews). Two data collectors used key word searching to identify and retrieve travel reviews with content on hospitality experiences of people with mobility impairments posted in these forums during the period of 2004—2012. The key words adopted for searching are relatively broad and represent the travel experiences

across different hospitality sectors (i.e., lodging, transportation, restaurants, gaming, and cruise experiences). The examples of key words that have been adopted in searching are: "accessibility/ADA," "mobility disabilities/impairments/barriers/difficulties," and "wheelchair/crutch/cane." After researchers scanned all the reviews and categorized them into hospitality sectors, the categorization results showed that a majority of reviews were about lodging experiences, which is the focus of this study. After filtering out reviews about hospitality sectors other than the lodging sector, the travel reviews mainly covered customer experiences staying at hotels, lodges, motels, vacation apartments, and resorts.

3.1. Quantitative content analysis

All the harvested lodging reviews were initially analyzed with quantitative content analyses in two steps to identify the most lodging service attributes that most concern customers with mobility challenges, based on a CATPAC-WORDER method proposed by Stepchenkova et al. (2009). First of all, CATPAC was adopted to analyze the large scope of reviews, which is a text analyzing program that can count word frequency in a large amount of texts and identify the most frequent words (Woelfel, 1998). From the online lodging reviews, CATPAC identified the lodging service details that most concern people with mobility challenges, which were represented by the most frequent words those people mentioned. The identified most-frequent key words were then processed in WORDER, a software program designed to automate counting of specific words and their variants in large pools of texts (Kirilenko, 2007). Consequently, the frequency of each service detail as presented in each travel review was produced as the outcome of WORDER processing. The frequency numbers for the identified service details across all the studied travel reviews were thereafter factor-analyzed to extract the general service attributes underlying those service details that lodging businesses should attempt to address. These general service attributes are the basis for upcoming analyses of relationships between service attribute performances and customer satisfaction. Such service attribute extraction by software and factor analyses largely reduces the subjective bias as compared to researchers merely identifying service attributes from their own interpretation of the texts. The details about quantitative content analysis procedure are described as follows.

Each travel review was first spell-checked and format-corrected to meet CATPAC requirements. The CATPAC program then processed all the travel reviews together and produced a ranking of most frequent words (up to 100) that customers with mobility challenges adopted to describe their lodging service experiences. Some of the frequent words did not necessarily add to the meaning, such as adjectives, pronouns, or words like "disability/disabilities" and "service/services" that were too generic to aid service attribute specification. Such words were thereby included in an Exclude file of the CATPAC program, where CATPAC will automatically ignore those words during the next run. With a second run of a CATPAC, new words appeared in the ranking, with some meaningful words and some meaningless ones that needed to be filtered out again. Such processes were repeated twelve times and ended when there were no additional meaningful words to be identified. Consequently, 73 meaningful words were identified from the CATPAC program, representing lodging service details that most concern customers with mobility challenges (see Table 1).

The WORDER software was adopted thereafter to count the frequency of these most-concerning service details (as represented by the 73 key words) in each separate travel review. In order to count all the words depicting the same service detail, WORDER also counted the variants of these key words also used by customers

with mobility challenges to express the same service details that CATPAC failed to identify due to their a lack of frequency. The 73 key words and their variants hence formed a "dictionary" for the WORDER program to count, which included words such as "help" (key word), "assist" (variant), and "assistance" (variant), "distance" (key word), "near" (variant), "nearby" (variant), "close to" (variant), as well as "slippery" (key word), "drain" (variant), "leaking" (variant), and "flood" (variant). Based on the specified "dictionary" words, WORDER then ran through each travel review, replaced all the variants with their corresponding key words, and counted the frequency of those representative key words in each travel review.

A frequency matrix of key words across different travel reviews was consequently formed, which was then factor-analyzed using the principle component analysis with direct oblimin rotation, in order to extract an interpretable structure of service attributes from the numerous non-patterned key words (Stepchenkova et al., 2009). The direct oblimin rotation was chosen because in the textual files, a word can represent different meanings in different situations, so it is reasonable that the same word is loaded on several factors and carries distinct meanings. As such, factors may not be orthogonal to each other due to the overlapping words and meanings (Klein, 1994). For the same reason, the cross-loadings are allowed as long as they all have different meanings (Klein, 1994) The frequency matrix of 543 cases and 73 variables in this study thus gives a solid case to the variable ratio of 7.44 (Klein, 1994). The highly significant Bartlett's test ($p < .001$) and the Kaiser-Meyer-Olkin statistic of sampling adequacy of .631 both demonstrated the frequency matrix as a factorable correlation matrix. A repeated key word trimming procedure was conducted, and 34 key words with low correlation coefficients as diagnosed in the anti-image matrix ($<.4$), low communalities ($<.5$), or with loadings lower than .35 on any factor were eliminated one at a time (Klein, 1994). The remaining 39 key words produced 16 factors that explained 62.34 percent of the total variance. Also, the factor structure of 16 service attributes was theoretically interpretable and structurally stable regardless of the order of key word trimming. The results of these analyses are shown in Table 2.

With regard to examining the internal consistency of key words under each service attribute, the Chronbach's alpha test is not appropriate for this study. Many existing content analysis studies have adopted alpha tests because of the relative homogeneity of their key words' contents, which confirms the equal item variance

assumption underlying the alpha test (Graham, 2006). Such homogeneity of key words' contents is due to key words in those studies being extracted from responses of studied subjects to the same question, asking their opinions about a specific subject, i.e., "What image or characteristics come to mind when you think of XX as a travel destination?" In this study, however, the key words are extracted from customers' spontaneous share of their diverse lodging experiences, ranging across different lodging businesses and travel scenarios, and those shares also came out of different reasons for their responses, from praises to complaints. Hence the key words identified in this study involve many significant variances in the contents, therefore violating the alpha test's assumption of item equivalence. This violation of the equivalence assumption would cause the underestimation of reliability by alpha test (Lord, Novick, & Birnbaum, 1968). Moreover, it is hardly possible to meet the perfect unidimensionality as assumed by the alpha test in this study (Sočan, 2000), as a key word under different contexts may represent totally different meanings. For example "door" was sometimes mentioned in the context of an entrance/exit door that was too heavy to open, yet other times was mentioned as the guest room door which was too narrow for a wheelchair to get through.

Given these considerations, to better estimate the internal consistency of each service attribute factor (which did not depend on satisfying the assumption of item equivalence or perfect unidimensionality), the more accurate Omega test of internal consistency is used (Dunn, Baguley, & Brunsden, 2013). As the Omega consistency shares the similar cut-off criteria with Chronbach's alpha test (Dunn et al., 2013), those factors with consistency value under .5 should be removed for a reliable factor structure (George & Mallery, 2003). Those factors with relatively low consistency values (larger than .5 yet smaller than .7) are possibly due to the small number of key words in each attribute factor, which likely causes an underestimation of consistency values (Graham, 2006). Also, the occasional cross-loadings of words between attribute factors could also explain the less-than-sufficient consistency values.

The adoption of this relaxed retaining criteria is due to the exploratory nature of service attribute identification in this study, where elimination of one attribute factor risks missing a possibly crucial aspect of lodging services that most concern customers. A restrictive factor elimination in this study would also significantly reduce the comprehensiveness and interpretability of the factor structure. Besides, the initial intention of using the rich web data to

Table 1
Lodging service key words identification by CATPAC.

Key word	Freq.	Key word	Freq.	Key word	Freq.	Key word	Freq.
Bathroom	368	Height	87	Lobby	30	Care	21
Shower	333	Entrance	80	Phone	30	Swim	21
Assistance	324	Dining-room	77	Chairs	29	Exit	19
Staff	324	Clean	76	Pet	29	Hoist	19
Elevator	283	Slope	72	Fire	29	Assurance	18
Steps	264	ADA	70	Seat	29	Showerhead	18
Floor	227	Ground	62	Push	28	Policy	17
Parking	206	Bar	57	View	28	Separate	17
Space	205	Breakfast	53	Dangerous	26	Towels	17
Door	198	Food	53	Sink	26	Welcome	17
Bed	183	Double	51	Informed	25	Aware	16
Reception	155	Roll	48	Wait	25	Choice	16
Friendly	148	Luggage	46	Heavy	23	Comfortable	15
Toilet	138	Reservation	43	Public	23		
Handrail	136	Distance	39	Fire	29		
Ramp	132	Management	39	Seat	29		
Location	112	Slippery	38	Information	22		
Pool	96	Attitude	36	Charge	22		
Regular	95	Tub	33	Equipment	22		
Wet	88	Accommodate	31	Website	22		

Table 2
Exploratory factor analysis of lodging service attributes that concern customers with mobility challenges.

No.	Factor	Words	Factor loadings	Communities	Variance explained	Omega consistency value
1	Shower accessibility	Roll	.820	.677	8.352	.766
		Tub	.692	.601		
		Shower	.676	.707		
		Seat	.661	.578		
2	Entrance accessibility	Entrance	.642	.589	6.552	.553
		Ramp	.620	.584		
		Steps	.391	.614		
3	Room settings	Bed	.740	.623	4.764	.544
		Height	.709	.641		
		Door	.371	.553		
4	Staff attitude and capability	Staff	.786	.690	4.254	.578
		Attitude	.635	.534		
		Assistance	.564	.655		
5	Access to room	Floor	-.785	.728	4.008	.512
		Ground	-.766	.638		
6	Emergency preparation	Door	.369	.553	3.864	.282
		Fire	.754	.619		
		Exit	.733	.584		
7	Information credibility	Assurance	-.800	.654	3.706	.542
		Information	-.575	.554		
		Regular	-.541	.566		
8	Moving convenience	Separate	-.774	.603	3.424	.514
		Push	-.759	.642		
9	Room quality	Comfortable	.762	.632	3.378	.523
		Clean	.748	.623		
10	Dining quality	Dining	.834	.725	3.189	.551
		Food	.604	.584		
11	Pet policy	Ada	.771	.621	3.013	.288
		Dog	.559	.653		
12	General lodging feature	Location	.792	.657	2.926	.503
		Views	.319	.502		
13	Policy accommodation	Wait	.765	.621	2.895	.300
		Parking	.574	.589		
		Policy	.529	.557		
14	Public area accessibility	Public	-.798	.678	2.781	.512
		Distance	-.582	.645		
15	Safety design	Slippery	.733	.662	2.644	.613
		Dangerous	.654	.633		
		Shower	.351	.707		
16	Luggage and equipment support	Luggage	.823	.724	2.588	.527
		Assistance	.382	.655		
		Steps	.352	.614		

extract all possible service attributes that most concern customers with mobility challenges would be compromised. Given these considerations, the attribute factors with consistency value of .5 or above are kept to preserve the factor structure integrity and information richness, whereas attributes of *emergency preparation*, *pet policy*, and *policy accommodation* that fall down the .5 cut-off consistency criteria are eliminated from any further analyses. The obtained consistency values are listed in Table 2. The high factor loadings and percentage of explained variances also justifies the retaining decision (Table 2). Consequently, only thirteen service factors that most concern travelers with mobility challenges could be identified: *shower accessibility, entrance accessibility, room settings, staff attitude and capability, access to room, emergency preparation, information credibility, moving convenience, room quality, dining quality, pet policy, general lodging feature, policy accommodation, public area accessibility, safety design,* and *luggage and equipment support* (see Table 2).

3.2. Qualitative content analysis

The thirteen attributes that are quantitatively identified are then interpreted for verification and supplementation of concrete details. The qualitative analysis adopted herein is deductive in nature (Mayring, 2001) and tests whether all the specific service details mentioned in texts can be well-categorized and interpreted under the thirteen-attribute structure (Marshall & Rossman, 2010; Mehmetoglu, 2004). Using the word search tool in Word software, every key word composing a service attribute factor is checked through all the travel reviews for different contextual meanings it may represent, which are the specific service details (Hsieh & Shannon, 2005). Then the researchers evaluate to what degree each service attribute concluded from the earlier factor analysis summarizes all the possible contextual meanings of its composing key words. The comparison table of key words meanings (service details) with quantitatively drawn attribute factors is listed in Table 3, which shows that the different service details underlying each key word can be well captured by its corresponding attribute factor, demonstrating that all the service details fit neatly in the frame of thirteen service attributes. Besides the verification of thirteen-attribute structure, such in-text review of service details also provides concrete interpretation of each attribute so that lodging businesses can better understand what each service attribute entails and what specific service details need to be addressed in order to improve the generic service attributes. The practical suggestions from customers on how to address those service details are also summarized from the qualitative interpretation.

The following describes the meanings of the thirteen service attributes, the most stressed service details under those attributes, as well as some customer-recommended solutions to the salient

service details. First of all, *Staff attitude and capability* was the most-frequently mentioned attribute (in 53.4 percent of reviews). It primarily highlights the attitude of staff or managers more than their assistance capabilities. More than half of the customers who mentioned this attribute stressed how the attitude of staff/managers sometimes solely determines their overall satisfaction with the lodging services. Additionally, disproportional importance was allocated to the service detail of "responsiveness in compensating for service failures." In the case of a service failure, a proper apology and compensation can even reverse the dissatisfaction experienced by many customers. One of such examples provided by a disabled electric wheelchair customer noted that the facilities were not quite accessible, but staff went out of their way to assist the customer: "The staff are very friendly and helpful. They will move furniture and cater to special needs of the disabled." A second most-frequently mentioned attribute was *Room settings* (in 44.4 percent of reviews) which primarily emphasizes the size and arrangements of facilities within a guest room, followed by *Shower accessibility* (mentioned in 32.5 percent of reviews), as "unable to shower" was often described as a primary cause of ruined lodging

experiences. Particularly, the service details of "roll-in shower," "shower seats," and "handheld showerhead" are mentioned at the leading frequencies.

Public area accessibility (28.2 percent) suggests the easy access of this population to the "public" areas of lodging such as front desk, parking area, dining area, public toilet, and swimming pool as well as the availability of accessible facilities in these areas, such as toilet or parking spots and pool changing rooms. As a major concern of customers was the improper occupancy of accessible facilities in public areas by abled customers, the review providers noted that the client coordination by lodging staff was crucial in resolving this problem.

Room quality (mentioned in 23.9 percent of reviews) highlights that the accessible room should have a quality level that meets standard rooms. Many reviewers found the accessible room to be leaking, noisy, dusty, or even used by staff to stock the cleaning equipment. It was primarily a sense of disrespect that drove their dissatisfaction when the accessible room was of poor quality. As one customer complained, "I am disabled and use a service dog. They wanted to charge me an extra $50 for my service dog, which is

Table 3
Qualitative interpretation of service details by the Thirteen-attribute structure of customer satisfaction.

Service attribute	Service details
Shower accessibility	• roll-in shower • shower seat with good quality • sufficient shower handrails at reachable locations • handheld showerhead • reachable shower gel and towels
Entrance accessibility	• easily accessible ramp • short distance from parking area • ease of opening the entrance door
Room settings	• proper height of bed, toilet, sink, mirror, hangers, and towels • a separate bed for the caregiver • large room size • furniture arrangements for wide movement space • wide doors
Staff attitude and capability	• welcoming check-in at the front desk • patience for consultation • efforts for trouble resolution and special needs accommodation • respect and politeness in communications • responsiveness in compensating for service failures
Access to room	• room at ground level • functional elevator to access the room
Information credibility	• reliable assurance of facility accessibility • reliable reservation of accessible room and parking space • sufficient information about facility accessibility
Moving convenience	• ease of pushing wheelchairs around (i.e., slope of ramp or paving) • ease of opening connecting doors • easily accessible elevator connecting different building functional areas • amenities, dining areas, or front-desk services in the same building
Room quality	• cleanliness • comfort • quietness • equality of room quality between accessible and regular rooms
Dining quality	• food quality • table and seat height adaptation to wheelchairs • food delivery to guest room
General lodging feature	• building location for easy access • accessible surrounding areas • accessible transportation for travel • enjoyable scenery view • cleanliness and tidiness of facilities
Public area accessibility	• no steps in the public area • functional accessible facilities in public area (i.e., accessible toilet and parking spots, pool changing room) • occupancy of accessible facilities by abled people
Safety design	• sink and shower design to prevent slippery-and-fall risks • evenly paved ground to avoid bone-cracking risks • quality of chairs/shower seats for safe body transfer
Luggage and equipment support	• staff assistances with luggage/equipment delivery • equipment rental services (i.e., wheelchair, bed hoists, or pool hoists rental) • proper handles on personal equipment

completely illegal. They gave me a room that had one queen bed instead of two single beds. Then they gave me a room without electricity. The room I settled for didn't have heat. Every time I asked for another room, or tried to bring in my service dog, I was screamed at by the manager."

Information credibility (mentioned in 19.7 percent of reviews) was negatively evaluated by most of these review providers and resulted in an immediate dissatisfaction with the entire stay. Many customers frequently found standard facilities instead of accessible ones being provided upon their arrival. *Moving convenience* (mentioned in 18.8 percent of the reviews) refers to the convenience for people with mobility challenges to move around the lodging facilities by supplying necessary facilities such as properly sloped ramps, clearly marked and large-size elevators, or a concentration of amenities in nearby areas. *Access to room* (mentioned in 15.6 percent of the reviews) refers to the ease customers have in accessing their rooms when coming from lodging public areas. For *entrance accessibility* (mentioned in 13.3 percent of reviews), the use of automatic doors at the entrance often resulted in high evaluations from the respondents, such as, "To my amazement the front door was automatic, which made life easy for me and my wife."

Some less-frequently mentioned attributes that may be potentially influential in customers' satisfaction include *Dining quality* (mentioned in 9.2 percent of reviews), specifically speaking of the customized dining services that cater to individual special needs and food quality. The twelfth factor of *Safety design* (noted in 6 percent of reviews) covers the potential health and life dangers emphasized by people with mobility challenges when encountering some improper facility designs. The last factor, *Luggage and equipment support* (noted in 6 percent of reviews) included the often-mentioned lack of assistance with carrying heavy luggage as a definite case of dissatisfaction with staff services, especially when there are steps to climb before reaching guest rooms or the lobby. The customized services provided by special equipment rental was highly appreciated as a pleasant surprise that contributed to a memorable service experience.

3.3. Satisfaction structure analysis

Given the thirteen lodging service attributes that concern people with mobility challenges, the most being identified using a CATPAC-WORDER approach and affirmed by qualitative content analysis, a binary logistic regression analysis with dummy variables (adapted PRCA approach) was then conducted with STATA 11.2 to determine which of the thirteen service attributes have significant influence over the satisfaction of customers with mobility challenges. The different levels of influences by these service attributes, being captured by the three-factor attribute structure of satisfaction, were also identified from the regression coefficients.

Given the difficulty and inaccuracy for researchers in identifying the magnitude of satisfaction/dissatisfaction from textual data, the dependent variable *Overall Satisfaction* (OS) was only coded into a binary variable, indicating the presence of satisfaction (OS = 1) versus dissatisfaction (OS = 0). For instance, when a customer provided a positive conclusion in a review about his/her overall stay, such as happiness about the stay, willingness to revisit the lodging business in the future, or recommendations of this business to others, then OS was coded as 1 for the review. Similarly, the negative expressions would result in a coding of OS as 0, representing dissatisfaction. Despite the lack of satisfaction magnitude measure as compared to the scale measure of customer satisfaction per existing PRCA analyses, the binary logistic regression in this study can provide a relatively accurate prediction of the probability for customers feeling satisfied versus dissatisfied given certain

service attribute performances (Pohlman & Leitner, 2003).

There are two dummy variables for each of the thirteen identified service attributes in this study, one for the presence of a high performance (X_{j+}) and the other for the presence of a low performance (X_{j+}). When a customer expressed a poorly performed attribute in a review, the two dummies for this attribute were accordingly coded as $X_{j+} = 0$ and $X_{j-} = 1$, and if a high performance was reported for an attribute, then the dummy variables for this attribute were coded as $X_{j+} = 1$ and $X_{j-} = 0$. Otherwise, if an attribute has not been mentioned in a review, then both dummies were coded as 0.

Initially the overall satisfaction (OS) variable was regressed on all 26 dummy variables (X_{j+} and X_{j-} for each of the identified thirteen service attributes). The equation is as follows, where $P_{OS} = 1$ is the predicted probability for customers to feel satisfied, a_0 is the constant, and β_+ and β_- are the odds ratios of high-performance dummy variables (X_{j+}) and low-performance dummy variables (X_{j-}), respectively:

$$\text{Odds}(\text{Overall Satisfaction}(OS) = 1) = \frac{P_{OS=1}}{1 - P_{OS=1}}$$
$$= \exp\left(a_0 + \sum_{j=13}(\beta_+ X_{j+} + \beta_- X_{j-})\right)$$

The initial conduction of the binary logistic regression excluded two statistically non-significant service attribute variables, that of *Dining quality* and *Safety design*. The results of the second estimation after variable exclusion are listed in Table 4. The overall model fit to the data is good given its demonstration of improvement over the null model (Likelihood ratio chi-square (16) = 551.17, p < .001). The model results in 94.55 percent of correct classification, considerably higher than 55.26 percent of the maximum chance criterion. Eleven service attributes were identified as influential to the overall satisfaction of customers with mobility challenges involve (see Table 4). The odds ratios of the statistically significant dummy variables (Table 4) show the amount of likelihood increases (or decreases) for a customer to feel satisfied (or dissatisfied) given a good (or bad) performance of a service attribute, with other service attributes' performances controlled. For instance, the odds of a traveler being satisfied increases by a factor of 21.27 when there's good shower accessibility, with other service attribute performances controlled.

Evaluating all eleven service attributes' joint contributions to overall lodging service satisfaction and dissatisfaction, the three-factor structure of satisfaction was identified based on a comparison between the "reward" coefficient (β_+) and "penalty" coefficient (β_-). The penalty coefficient (β_-) indicates the log-likelihood decrease of satisfaction due to the low performance of a service attribute, whereas the "reward" coefficient (β_+) indicates the log-likelihood increase of satisfaction due to the good performance of the same service factor. A Wald test was performed to assess the magnitude equality of β_+ and β_-, in order to determine whether an attribute has more contributions to satisfaction or rather more influences on dissatisfaction. Only five service factors with both β_+ and β_- identified as statistically significant from the binary logistic regressions were tested, including *shower accessibility*, *room settings*, *staff attitude and capability*, *access to the room*, and *public area accessibility* (Table 4).

While H0: $\beta_- + \beta_+ = 0$ indicates the equality of penalty versus reward effects of a service factor on satisfaction, the test results show that the null hypothesis has not been rejected by any of the five tested attributes (Table 4). It instead demonstrates that all of the five tested service attributes are performance factors, with a

Table 4
Binary logistic regression estimation of coefficients for penalty-reward contrast analysis.

Attributes	Low performance dummy variable					High performance dummy variable					Sig. H$_0$: β$_-$ + β$_+$ = 0	Factor type
	β$_-$	S.E.	Wald	Odds ratio	Predicted % of dissatisfaction	β$_+$	S.E.	Wald	Odds ratio	Predicted % of satisfaction		
Shower accessibility	−2.089****	.644	−3.25	.124	.90	3.057****	.838	3.65	21.267	.89	.376	Performance
Entrance accessibility	−1.829***	.687	−2.66	.161	.89							Basic
Room settings	−2.087***	.739	−2.82	.124	.90	1.784****	.538	3.32	5.952	.69	.764	Performance
Staff attitude and capability	−2.461**	.985	−2.5	.085	.93	3.07****	.478	6.42	21.539	.81	.594	Performance
Access to room	−3.567****	.947	−3.77	.028	.97	4.065***	1.453	2.8	58.25	.97	.767	Performance
Information credibility	−2.098***	.749	−2.8	.123	.90							Basic
Moving convenience	−1.897****	.592	−3.2	.15	.89							Basic
Room quality						1.028*	.617	1.67	2.795	.60		Excitement
General lodging feature						1.941***	.656	2.96	6.963	.78		Excitement
Public area accessibility	−2.447****	.588	−4.16	.087	.92	2.724***	1.063	2.56	15.241	.87	.824	Performance
Luggage and equipment support						3.442***	1.28	2.69	40.003	.95		Excitement

Likelihood ratio test: χ^2 = 551.17 (df = 16).
Log-Likelihood Intercept only: −365.801, full model: −90.217.
Pseudo R Square (Cox & Snell: .645, Nagelkerke: .863).
Classification accuracy:94.55%, Hosmer and Lemeshow test: 2.79 (sig. = .247).
*$p < .1$; **$p < .05$; ***$p < .01$, ****$p < .001$.

linear relationship existing between their performances and the overall satisfaction of customers with mobility challenges. Another three service factors only showed statistical significance in penalty effects (Table 4) and were thereby classified as basic factors, that of *entrance accessibility*, *moving convenience*, and *information credibility*. The three remaining attributes of *room quality*, *general lodging feature*, and *luggage and equipment support* were identified as excitement factors, as only reward effects have been found to be statistically significant (Table 4).

As a useful reference, the percentages of high and low performances for each service attribute as perceived by customers with mobility challenges are summarized in Table 5 as an observation of the current overall performances of lodging services for this market. These percentages were calculated by counting the number of positive reviews about an attribute, and dividing this frequency by the total number of travel reviews that mentioned this attribute. The results showed that, regarding the *performance factors*, over half of the businesses provided good shower accessibility (50.87 percent), accessible room settings (63.56 percent), and satisfactory staff attitude and capability (68.31 percent). Yet only a minority of those businesses performed satisfactorily on easy access to the guest room (30.12 percent) and easy access to public areas in the hotel (36.67 percent). The businesses' overall performance on the *basic factors* and *excitement factors*, on the other hand, cannot be accurately evaluated with this approach. As for *basic factors*, people are more likely to remember and report these factors' low performances rather than their high performances if not required to, as in the unstructured web data, therefore the frequency of high

performances for *basic factors* may be underestimated if they are solely evaluated based on such freely expressed data. Likewise, with the high performances being more salient than low performances for *excitement factors*, these factors' low performances may not always be reported in the customers' report as compared to their high performances, and may thus lead to an underestimation of low-performance frequencies. This is nevertheless not a problem for *performance factors*, which are salient to customers with mobility challenges under both high and low performances.

4. Conclusions and implications

Being the first attempt to integrate quantitative and qualitative web content analysis with Penalty-Reward Contrast Analysis (PRCA), the current research reveals the service attribute structure of lodging satisfaction among customers with mobility challenges. Practically, this study provides a strategic order for lodging businesses to implement/improve service attributes so that they can maximize the satisfaction of customers with mobility challenges despite the possible limits of budgets or resources. Initially, a lodging business should prioritize the bottom-line delivery of service attributes which with negative performance can result in significant customer dissatisfaction (including the basic and performance factors); with more available investment resources, the lodging business should move on from avoiding customer dissatisfaction to maximizing customer satisfaction through the above-and-beyond service delivery, including the implementation of excitement factors and further improvement of performance factors. Such a

Table 5
Frequency distribution of performance failure and success.

Attributes	Frequency of performance failure	% Of performance failure	Frequency of performance success	% Of performance success
Shower accessibility	85	49.13%	88	50.87%
Entrance accessibility	54	76.06%	17	23.94%
Room settings	86	36.44%	150	63.56%
Staff attitude and capability	90	31.69%	194	68.31%
Access to room	58	69.88%	25	30.12%
Information credibility	91	86.67%	14	13.33%
Moving convenience	78	78%	22	22%
Room quality	42	33.07%	85	66.93%
General lodging feature	21	29.58%	50	70.42%
Public area accessibility	95	63.33%	55	36.67%
Luggage and equipment support	14	43.75%	18	56.25%

thorough addressing of service attributes could better guarantee the efficient allocation of the businesses' resources.

In this study, the adapted PRCA approach classifies eleven customer-identified lodging service attributes into basic, performance, and excitement factors that contribute differently to customer satisfaction. The basic and performance factors that contribute significantly to customer dissatisfaction are proposed to be implemented as priorities. For the client market dealing with mobility challenges, failure to meet their bottom-line expectation about these factors may cause a business to be susceptible to lawsuits. The basic factors, including *entrance accessibility*, *moving convenience*, and *information credibility*, must meet the expected level of performance to avoid strong dissatisfaction from this market. There is no need to spend undue resources to over-perform on these service factors, however, as their over-performance would not result in a significant increase of overall satisfaction. Some simple (and not overly costly) tactics by lodging managers should be sufficient to address these basic factors, such as providing detailed and accurate accessibility information providence through websites and staff, a tracking system recording customers' special needs and accommodations, blocking of the accessible rooms and parking spots for people who indeed need them, and staff assignments to assist people with mobility challenges at the entrance for parking, entering, and checking-in procedures.

The five performance factors involving *shower accessibility*, *room settings*, *staff attitude and capability*, *access to the room*, and *public area accessibility* cause constant returns in overall satisfaction/dissatisfaction. Given that these factors can also have significant influences over dissatisfaction, they should also be addressed as priorities that are similar to the basic factors. Once these attributes reach the bottom-line performance level that results in no customer dissatisfaction, the further improvements of these attributes can definitely significantly increase customer satisfaction. Yet further improvements should depend on the positioning and budgeting of a lodging business despite its wishes for every service dimension's optimum performance. Observing the eight-year web data, over half lodging businesses were found to perform satisfactorily on *shower accessibility, staff attitude and capability,* and *room settings,* yet only a minority performed well enough on *access to the room* and *public area accessibility*, which suggests some common deficiencies of performance factors that need to be addressed within the lodging industry. Some possible strategies that may fix this problem include: *access to room*, which can be improved by ensuring the functionality of elevators and securing ramp appliances to any existing steps on the way to/from the accessible guest rooms. *Staff attitude and capability,* on the other hand, needs the professional training of employees and managers to increase awareness of how to serve the population with mobility challenges. Specifically, respectfulness, patience, and responsiveness are the most expected/desired characteristics of staff when serving this population. Although most lodging businesses have initiated some level of employee training for serving this market, a large proportion of these trainings lack a standardized criteria and thus have not produced satisfactory outcomes (Kim & Lehto, 2012). More effort should therefore be invested in standardizing such training programs, as it has been proven by both quantitative and qualitative results of this study that, the insufficiency of physical accessibility in lodging businesses to a large degree can be compensated by pleasant and respective service encounters with staff (i.e., comparing the coefficients of physical accessibility dummy variables with staff attitude dummy variables in Table 4), and particularly, by the proper and timely recovery tactics from the management level in cases of poor reviews or complaints (i.e., sincere and compassionate explanation with honesty instead of fooling the customers, and financial compensation in terms of price

deduction, gift, or service upgrades) (Vázquez-Casielles, Iglesias, & Varela-Neira, 2012).

The remaining three excitement factors, *room quality*, *general lodging feature*, and *luggage and equipment support*, are crucial for enhancing the long-term service competency of a hospitality business. Yet considering the possible short-term resource limits, these factors can be promoted after securing the bottom-line delivery of basic and performance factors. On this factor level, the studied customers with mobility challenges anticipated enjoying the common lodging services as much as the general market does, such as being assigned to a clean and comfortable room with great/adequate views. Moreover, a definite value addition is the customized service provided to this population, in particular, that businesses can create highly satisfactory experiences for customers through proper mobility-aid equipment support and proactive problem-solving efforts to accommodate people's individualized special needs on a timely basis.

In summary, the bottom-line performance of basic and performance factors needs to be secured first to avoid customer dissatisfaction. Yet the further improvements of performance factors as well as the implementation of excitement factors for the purpose of maximizing customer satisfaction can be optional, depending on the available investment resources of a lodging business. Specifically, differences among the basic and performance factors can be further ranked by their extent of influence on dissatisfaction, which is also the recommended strategic order of implementation. According to the magnitude of regression coefficients, the recommended strategic order to implement the basic and performance factors is as follows, ranging from the most urgent to least urgent: access to room ($\beta_- = -3.567$), staff attitude and capability ($\beta_- = -2.461$), public area accessibility ($\beta_- = -2.447$), information credibility ($\beta_- = -2.098$), shower accessibility ($\beta_- = -2.089$), room settings ($\beta_- = -2.087$), moving convenience ($\beta_- = -1.897$), and entrance accessibility ($\beta_- = -1.829$). Likewise, considering the strategic order for implementing excitement factors and further improving performance factors for maximizing customer satisfaction, the performance and excitement factors can also be ranked according to their extent of influences on customer satisfaction, from most urgent to least urgent: access to room ($\beta_+ = 4.065$), luggage and equipment support ($\beta_+ = 3.442$), staff attitude and capability ($\beta_+ = 3.07$), shower accessibility ($\beta_+ = 3.057$), public area accessibility ($\beta_+ = 2.724$), lodging general feature ($\beta_+ = 1.941$), room settings ($\beta_+ = 1.784$), and room quality ($\beta_+ = 1.028$).

Methodologically, the newly proposed mixed-method approach, an integration of quantitative and qualitative content analysis as well as the PRCA approach, provides competitive accuracy and reliability in identifying tourist service-satisfaction structures based on the readily accessible web textual data. First of all, it is this extension of PRCA analysis that enables PRCA to analyze textual data and thus has comparative advantages over the scale-based PRCA analysis, as the naturally expressed textual data can better reflect customers' real-life lodging evaluation procedures. Moreover, a mix of quantitative and qualitative content analyses allows a more thorough and accurate analyses of the complex web textual data. While most of the existing web content analyses in the tourism and hospitality fields are either quantitative or qualitative, the mixed-method content analysis is still in its infancy in these fields (Banyai & Havitz, 2013; Ip, Law, & Lee, 2011). In this study, the quantitative approach ensures efficiency and broad-based understandings of tourist needs by fully unraveling the complexity of textual data and identifying the generalizable thirteen lodging service attributes that most concern customers with mobility challenges. The qualitative interpretation further enhances accuracy by affirming the identified service attribute structure in relation to the evaluations, where the thirteen service

attributes are found to capture all the concrete service details mentioned in texts. The qualitative process further achieves richness in detail by highlighting the most salient service nuance underlying each service attribute and customers' recommended solutions to better guide lodging businesses' directions for improvements. Such application of mixed-method content analysis in this study contributes to the field by providing a great potential of mixed content analyses in fully exploiting a large pool of web textual data with not only the efficiency and generalizability, but also the accuracy and specificity needed to make industry marketing and service decisions.

The hospitality studies thereafter could apply this approach to each sub-lodging sector (i.e., hotel, resort, vacation apartment), or across other hospitality sectors (i.e., restaurants, attractions, transportation), or among the general tourist market to generate an order of priorities in developing various service attributes for maximum customer satisfaction based on customer-generated web content. Meanwhile, this new mixed-method approach is not exclusively in place for satisfaction analysis, but can also be potentially applied to distinguish the hospitality service attributes by their different contributions to customer purchase decision, repurchase decision, or likelihood to recommend the business to others, and so forth, all of which that can be extracted from the web reviews.

Future lodging studies based on web reviews would also benefit from extracting their alternative promising information. For instance, due to the unstructured content of travel reviews, some contextual factors may be missing or not explicitly mentioned by review providers, yet once obtained, ideally from every review provider, would greatly benefit the understanding of the service-satisfaction relationships, such as the impairment type, travel frequency, stayed lodging category, and travel distance from home. All such contextual information could potentially moderate and enhance relationships between the service attributes and overall customer satisfaction. A semi-structured format of travel reviews could hence be adopted by travel forums to collect the hidden contextual information about a lodging stay. Such information is valuable for in-depth understandings of tourist experiences not only for tourism and hospitality businesses to design customized services, but also for other potential tourists to conduct efficient information searching throughout the review process of travel planning.

Another valuable methodological implication has been drawn from the empirical analysis procedure, confirming that, the current mixed-method procedure is more efficient than purely manual coding and analysis, while still not an "automated" but rather a time-consuming procedure, given the dictionary construction based on repeated filtering of meaningful key words, the in-text detail extraction and interpretation by the service attribute structures, and also the valence coding of overall customer satisfaction and service attribute performances from each travel review. In attempting to facilitate a more automated procedure of web textual data analysis, the constructed dictionary identifying the 73 most frequently mentioned key words is promising in that it can be adopted as a standardized dictionary for lodging service-related studies among people with mobility challenges. It can also be used to analyze service attributes from other relevant travel reviews, including those about a specific lodging business, or from a specific segment of travelers with mobility challenges.

While these study approaches address the practical significance of the recommended attribute development order or priority for lodging businesses' service management, as well as the great potential of the proposed mixed-method approach in exploiting the customer-generated web textual data, the results of this study should be interpreted with caution. First of all, the results may be of limited generalizability to all travelers with mobility challenges, as not all of the reviewers are active on-line travel review providers. Yet given that online travel review is one of the primary sources of information and communication for travelers with mobility challenges (Ray & Ryder, 2003), full advantage should be taken of the information involved in the reviews when managing and promoting services. To confirm the generalizability of the current results, additional interviews can be conducted in the future among people with mobility challenges who do not express their opinions via web forums. Their interview textual data can also be analyzed following the same mixed-method procedure and compared with the above identified service-satisfaction structure to check for consistency. Also, the three attributes of *Emergency preparation, Pet policy,* and *Policy accommodation,* excluded from satisfaction analysis due to the low internal consistency values, may be meaningful attributes for customers even though they could not be identified as valid factors in the current study. Future studies should thus further explore the existence and relevance of these three factors and their possible influences upon customer satisfaction.

In addition, the overall satisfaction that people with mobility challenges experience with lodging services could only be accurately coded by valence instead of magnitude from the unstructured travel reviews. Less information about the extent of satisfaction than the scale measure in traditional survey studies on satisfaction structure is thus contained herein. Future studies could re-examine the lodging service structure of satisfaction among customers with mobility challenges using the traditional scale measure, while comparing it with the current study results to establish the convergent validity of the two approaches. Alternatively, researchers could attempt to code the levels of satisfaction in the web comments based on the emotional strength of the words people use to summarize the overall lodging experiences. For instance, the word "thrilled"/"mad" would indicate a more intensive satisfaction/dissatisfaction as compared to the word "fine"/ "unsatisfied".

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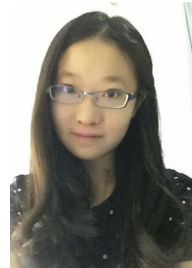
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Shu Tian Cole, Ph.D., Associate Professor Research interest is to understand tourists' travel experiences and perceptions of the quality of travel and tourism services. Her recent research is focused on the travel experiences of people with physical disabilities.