

Social Media in Quality Management: An Empirical Statistical Research on Hotel Online Review

Chengwei Zhao

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By: Chengwei Zhao

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Signed by the final Examining Committee:

Dr. Mohammad Mannan Chair

Dr. Onur Kuzgunkaya External Examiner

Dr. Anjali Awasthi Internal Examiner

Dr. Xiao Huang Supervisor

Dr. Chun Wang Supervisor

Approved by _____

Chair of Department or Graduate Program Director

_____2015

Dr. Amir Asif, Dean

Faculty of Engineering and Computer Science

ABSTRACT

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Chengwei Zhao

Hotel Online review is becoming a more and more popular topic in the hotel industry nowadays. Lots of research has been done and many interesting implications have been investigated. But very little research has been conducted from the different customer group perspective. In my thesis, I conducted a comprehensive statistical analysis mainly from the different customer group perspective and found out some very meaningful implications for the hotel industry. Some key contributions have been summarized as below: First, there exist significant mean differences in terms of six individual ratings and overall rating among different customer groups (Family, Business, Friend, Solo, and Couple). Second, the six different individual review items account for different weights in the overall rating scale. Third, there is a significant positive relationship between six individual review items and overall rating. Fourth, independent hotels are making better performance than chain hotels except for some certain customer group in terms of rooms and sleep quality rating. Also, among the five different customer groups, the ratings of individual and overall given by business customer group are the lowest compared with the other groups. These implications will help hotels allocate their resources more flexible and efficient rather than focus on every single aspect. Especially for those small and medium sized hotels, they may be able to run better business since they now learn where to allocate more resources according to the rank of the importance.

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Chapter 1 Introduction

1.1 Background

Word of mouth, or *viva voce*, is the passing of information from person to person by oral communication, which could be as simple as telling someone the time of day (Wikipedia, 2014). In business field, Word-of-mouth (WOM) denotes informal communication among consumers about products and services (Liu, 2006). Word of Mouth has been employed as one of the quality management methods recently which have been demonstrated that it does impact the product sales or decision-making process. In my thesis, I conducted a comprehensive research on hotel online review. I believe that the implications and thesis contributions will be beneficial to the hotel industry.

In terms of traditional WOM, many researchers have demonstrated its impact on customers. For instance, traditional (offline) word-of-mouth has been verified to play an important role for customers' purchasing decisions (Richins & Root-Shaffer, 1988). Past research has also explained that word-of-mouth is more effective and efficient than traditional marketing methods of personal selling and conventional advertising media (Engel, Blackwell, & Kegerreis, 1969; Katz & Paul.). Therefore, it is critical to figure out the importance of the traditional word of mouth. The significance of interpersonal communication in customer decision processes has been discussed a lot in consumer behaviour research, with numerous studies describing the frequency of consumer word-of-mouth and its influence on recipients (Arndt, 1967). Even in this era of mass communications and mass advertising, it has been estimated that as much as 80% of all buying decisions are influenced by someone's direct recommendation (Voss Jr, 1984).

Electronic word-of-mouth (eWOM), also often refers to as online reviews, online recommendations, or online opinions, has gained importance with the emergence of new

technology tools (Serra Cantallops & Salvi, 2014). (Litvin, Goldsmith, & Pan, 2008) defined eWOM as “all informal communications directed at consumers via Internet-based technology related to the usage or characteristics of particular goods and services, or their sellers.” In terms of online customer reviews, it can be defined as peer-generated evaluations posted on company or third party websites (Mudambi & Schuff, 2010). During the buying process, customers want product attribute-value information and recommendations from various information sources. By acting as an informant and recommender, online consumer reviews have the capability of influencing the decision-making process of consumers. As an informant, online consumer reviews provide the type of product information that is similar to the information provided by sellers. However, online consumer reviews offer more consumer-oriented information, whereas sellers offer more product-oriented information such as product attributes, technical specifications, and performance results in relation to technical standards. On the other hand, online consumer reviews describe product attributes in terms of usage situations and measure the product performance from a user’s perspective (Lee, Park, & Han, 2008).

So what are the differences between traditional WOM and EWOM? The main differences between WOM and EWOM can be identified in the reach of the reviews’ influence (number of people who can be influenced) and the speed of interaction (Serra Cantallops & Salvi, 2014). Specifically, (Sun, Youn, Wu, & Kuntaraporn, 2006) conclude that “compared to traditional WOM, online WOM is more influential due to its speed, convenience, one-to-many reach, and its absence of face-to-face human pressure.” By contrast, (Ellison & Fudenberg, 1995) noted that conventional interpersonal word-of-mouth communication is only effective within limited social contact boundaries, and the influence diminishes quickly over time and distance. On the other hand, the advances of information technology have profoundly changed the way information is transmitted, and have transcended the traditional limitations of word-of-mouth. Consumers can now easily and freely access information and exchange opinions on companies, products, and services on an unprecedented scale in real time (Duan, Gu, & Whinston, 2008).

There are obvious advantages for electronic WOM with the high speed development of information technology. For instance, the advantages of EWOM include exceptional speed, lower cost, measurable, cross time and space constraints (Lin, 2012). EWOM communication through electronic media allows consumers to not only obtain information related to goods and

services from the few people they know, but also from a vast, geographically dispersed group of people, who have experience with relevant products or services (Ratchford, Talukdar, & Lee, 2001).

Although EWOM is becoming more and more popular, there are still some challenges ahead of it. Such as, the digitalization of WOM has created both new possibilities and challenges for market. (Dellarocas, 2003) indicated: (1) with the low cost of access and information exchange, EWOM can appear in an unprecedented large scale, potentially creating new dynamics in the market; (2) though broader in scope, the technology allows for greater control over format and communication types; and (3) new problems may arise given the anonymity of communicators, potentially leading to intentionally misleading and out-of-context messages.

1.2 Motivation

The common element of the business definitions is that the quality of a product or service refers to the perception of the degree to which the product or service meets the customer's expectations. Drucker, Peter (1985) argued that quality in a product or service is not what the supplier puts in. It is what the customer gets out and is willing to pay for. Also, American Society for Quality indicated that a combination of quantitative and qualitative perspectives for which each person has his or her own definition; examples of which include, "Meeting the requirements and expectations in service or product that were committed to" and "Pursuit of optimal solutions contributing to confirmed successes, fulfilling accountabilities". In technical usage, quality can have two meanings. First, the characteristics of a product or service that bears on its ability to satisfy stated or implied needs. Second, a product or service free of deficiencies. Word of Mouth is a popularly used estimate to evaluate the general customer satisfactory level or expectations.

Although many research have been done by countless researchers in the field of Word of Mouth, little studies has been done to address the study of taste difference between different customers' group. Also, what is the relationship between customers' return intention and the six individual review ratings? Are they equally important? What kind of strategies should be employed by small and medium sized hotels to compete with established chain hotels and 4-5 star hotels? This is what inspired me to address this thesis topic. I want to figure out all the questions above and

come up with some meaningful implications for the hotel industry. Specifically, whether significant mean differences exist among the five different customer groups is critical to hotel industry practitioners. More importantly, whether the six individual review ratings (Value, Rooms, Service, Cleanliness, Sleep Quality, Location) accounts for different weights in the contribution of the overall rating. If this is true, then it is good for hotel industry to know so they can better allocate limited resources to cater different type of customers according to their own situations.

1.3 Overview of the work.

To cope with the questions mentioned in the motivation part, a series of comprehensive statistical analyses are conducted to verify the hypotheses. First, I employed ANOVA to test hypotheses 1, 2a, 2b, 3a, 3b. Based on the definition from Wikipedia, Analysis of variance (ANOVA) is a collection of statistical models used in order to analyze the differences between group means and their associated procedures (such as "variation" among and between groups), developed by R. A. Fisher.

Through ANOVA analyses, we can conclude that significant mean differences exist among different customer groups in terms of six individual ratings and overall rating. (Family, Business, Friend, Solo, and Couple)

Researchers have done some research to review differences between business and leisure tourism purpose group. But in my thesis, I did a comprehensive statistical research from the perspective of different customer group. This is the very first time for researchers to analyze if there is any taste difference among different customer groups. Actually, this is a critical issue for hotel industry since they might provide better services to better cater to the different customer groups once they learned what are the taste difference and preference among them. This is definitely a great and valuable implication for the whole hotel industry.

Next, I established a regression model and followed that by conducting regression analyses to find out the six individual review rating and hotel star's weights account for the overall rating.

Through the regression analyses, we can conclude that the six different individual review items account for different weights in the overall rating scale. The rank of the importance was also acquired. Service, Rooms and Value ratings are the top 3 important items which account for more than 70% of the overall rating. This implication will help hotels allocate their resources more flexible and efficiently rather than focus on every single aspect. Especially for those small and medium sized hotels, they might be able to run better business since they learn how to allocate resources rationally according to the importance.

In the next section, I found out that there is a significant positive relationship between six individual review items and overall rating. But the significance of correlation is different; the correlation significance between service and overall rating is .804 and followed by rooms (.802), value (.781), cleanliness (.737), sleep quality (.716) and location (.462). It is clear that the six individual review items and overall rating are mutually correlated.

Last but not the least, I compared the pattern differences between independent and chain hotels and between 2-3 star and 4-5 star hotels. We conclude by Hypothesis 2a is supported. Hypothesis 2b is NOT supported. Hypothesis 4 is NOT supported. Generally speaking, Independent hotels are making better performance than chain hotels rather than chain hotels are performing better than independent hotels except for some certain customer group in terms of rooms rating and sleep quality. This is a super surprise for the public since most people may think chain hotels provide better service and acquired higher reviews because of this. Compared with independent hotels, chain hotels usually operate their business in a larger area. Generally, chain hotels have consistent management requirements and standards among branches. But in reality, according to the results of the research, independent hotels make better performance than chain hotels which is definitely a warning sign for chain hotels. Customers' ratings reflect their general service level. For chain hotels, they should improve their service to cater for different customer group. Otherwise, they might lose in the competition with independent hotels. For the comparison between 2-3 star hotels and 4-5 star hotels, we found out Hypothesis 3a is supported and Hypothesis 3b is NOT supported. Hypothesis 5 is NOT supported. Actually, the overall, service and cleanliness's rating given by business customer group for 4-5 star hotels are lower than that for 2-3 rating, which could be a surprise for hotel industry as well. Also, among the five different customer groups, the ratings of individual and overall given by business customer group are the

lowest compared with the other groups. Business customer group's rating in 2-3 star hotels is higher than that in 4-5 star hotels in terms of overall, service and cleanliness ratings. In general, people might think that 4-5 star hotels offer better service than 2-3 star hotels, but actually, it is not the case for business customer group. So, for 4-5 star hotels, they should continuously improve their service because of the higher hotel rates, otherwise, they may lose market share from business customer group.

1.4 Thesis contribution

1. Significant mean differences of online review rating exist among different customer groups in terms of six individual ratings and overall rating. (Family, Business, Friend, Solo, and Couple)
2. The six different individual review items account for different weights in the overall rating scale. We also acquired the rank of the importance. Service, Rooms and Value ratings are the top 3 important items which account for more than 70% of the overall rating.
3. There is a significant positive relationship between six individual review items and overall rating.
4. Generally speaking, independent hotels are making better performance than chain hotels instead of chain hotels are performing better than independent hotels.
5. 4-5 star hotels acquired higher review scores than 2-3 star hotels except for value aspect. Also, among the five different customer groups, the ratings of individual and overall given by business customer group are the lowest compared with the other customer groups.

1.5 Outline of the thesis

The rest of the thesis is structured as follows. Chapter 2 introduced a literature review on Word of mouth. Then, Chapter 3 conducted a comprehensive statistical analyses based on the data sets collected from Tripadvisor.com. Followed by the Chapter 4 where comparisons were conducted between 4-5 star and 2-3 star hotels and between independent and chain hotels. Chapter 6 concludes the thesis contribution and implications and future work.

Chapter 2 Literature Review and Research hypotheses

The topic of Word of mouth has been addressed by many researchers in the academia. A lot of opinions and implications have been purposed and acquired. This chapter introduced some word of mouth related literature review, for instance, Word-of-mouth in the hospitality and tourism industry.

2.1 The development of WOM

There is no doubt that EWOM has been developing very fast with the internet. Many researchers have published their opinions on it. In modern society, the advent of the Internet has extended consumers' options for gathering unbiased product information from other consumers and provides the opportunity for consumers to offer their own consumption-related advice by engaging in electronic word-of-mouth (EWOM). Given the distinct characteristics of Internet communication (e.g., directed to multiple individuals, available to other consumers for an indefinite period of time, and anonymous), EWOM deserves the serious attention of marketing researchers and managers (Hennig-Thurau et al., 2004). (Hu, Pavlou, & Zhang, 2006) also indicated that the rapid development of the Internet with its enhanced communication capabilities has dramatically increased the scale and scope of WOM communication. As an Internet-based version of WOM, online reviews have become a major informational source for consumers. In terms of the interpersonal perspective, consumer generated media (CGM) is one of the fastest-growing channels of interpersonal and informal communications. The Internet is providing the momentum for the accelerated growth in popularity of these new word-of-mouth (WOM) communications. Until now, WOM has been a widely used channel of interpersonal

communication that allows consumers to share information and opinions, directing buyers towards and away from specific products, brands, and services (Hawkins, Best, & Coney, 2004).

2.2 The Importance of online consumer reviews

Back to the topic of my thesis, in this article, I will mainly focus on the topic of online customer reviews which is becoming more and more popular nowadays. The importance of the word-of-mouth has been addressed by many researchers from different perspective. For instance, word-of-mouth communication (WOM) has long been a topic of considerable importance to marketing researchers and practitioners for a number of reasons (Gruen, Osmonbekov, & Czaplewski, 2006). In the Internet era, the effect and distribution of WOM have been further enhanced as individuals can make their opinions easily accessible to other Internet users (Dellarocas, 2003). Likewise, the importance of word-of-mouth (WOM) communication is widely accepted in traditional marketing research. Many studies have shown that WOM communication affects consumer attitudes on a wide range of products and services such as innovations (Shavitt, Swan, Lowrey, & Wänke, 1994), and automobiles (Weinberger, Allen, & Dillon, 1981). Online WOM is a useful tool for customers to reduce perceived risk by searching for information before buying new products (Zhu & Zhang, 2010). Online consumer reviews have become increasingly important as consumers continue to purchase products online. When consumers are not able to judge a product in person, they often rely on this e-WOM transfer to mitigate risks regarding product quality and the truthfulness of the seller. (Gretzel & Yoo, 2008) further claimed that travel reviews are often perceived as more likely to provide up-to-date, enjoyable, and reliable information than content posted by travel service suppliers. What's more, after a purchase has been made, online WOM also offers an easy and convenient way for consumers to comment on their acquisitions, complain about their dissatisfaction, share details with friends, or even argue with vendors (Lu, Ye, & Law, 2014). Because of this, it is important for sellers to make sure the good quality of the products. Otherwise, it will impact the perceived image of the company which probably leads to the reduction of the market share.

2.3 Impacts of EWOM

In this section, I will talk about the impacts of the EWOM on consumers. Web 2.0 and UGC have been increasingly changing the way that people search, share and consume information. As a consequence, they provide numerous opportunities for E-commerce (Sigala, 2009). Besides, (Ghose & Ipeiritis, 2006) examined the impact of online reviews on product sales for a variety of consumer products, and found that the subjectivity and polarity of the ratings in reviews had a significant influence on online sales of certain products. They explained their findings using the cognitive load theory, and indicated that certain types of online reviews reduce the cognitive load of the reader, thereby generating higher sales. Prior to the internet era, consumers acquired information on experience goods from mainly two channels: from the overall mass media system (TV, radio, newspapers, etc.) and retail network through advertisements, critics of experts and free samples in stores on the one hand and from word-of-mouth (WOM) resulting from discussions with friends and family on the other hand (Bounie, Bourreau, Gensollen, & Waelbroeck, 2005). Today, online customer reviews constitute new channels of information acquisition. Firms such as Amazon, Barnes and Nobles, etc. offer consumers the possibility to read and/or write positive or negative reviews on goods and to obtain and/or provide information and advices (Bounie et al., 2005). The influence of electronic WOM is directly applicable to tourism and hospitality as (Pan, MacLaurin, & Crotts, 2007) stated that online user-generated reviews are an important source of information to travellers. Obviously, EWOM impacts on product sales and different industries in different extends. In the next section, detailed discussion about the influence of the WOM on the consumers' decision-making process.

2.4 The influence of WOM on customers' decision-making process

Some researchers have demonstrated the influence of WOM on customers' decision-making process. To some extent, most studies consider the impact of reviews, either WOM or EWOM in the decision making process. (Xie, Xiao, & Yi, 2011) argue that electronic word-of-mouth (EWOM) is prevalent in today's lodging market and has potential to influence consumers' decision making process. The EWOM has been changing people's behaviour activities because of the growth of Internet usage. People often make offline decisions on the basis of online

information; furthermore, they tend to rely on the reviews given by other consumers when making decisions about matters such as which movie to watch or what stocks to invest in (Cushing & Douglas-Tate, 1985). So what about the impacts of the positive and negative customers' reviews? Prior studies (Houser & Wooders, 2006; Vermeulen & Seegers, 2009) showed that positive online reviews have a significant impact on customers' decision-making process. On the other hand, online customer complaints, if not handled properly, could easily lose loyal consumers for related products/services, reduce patronage, and create negative word-of-mouth (Au, Buhalis, & Law, 2009). For instance, (Litvin, Blose, & Laird, 2005) suggested that tourists' restaurant selections are predominantly influenced by the recommendations of friends or relatives and recommendations of staff at a hotel, with surprisingly few decisions being based on the influences of more formal media such as guide books and advertisements in magazines or newspaper. According to another survey with more than 2000 U.S. adults, between 79% and 87% of the readers of online reviews of restaurants, hotels, and travel services reported that the reviews had a significant influence on their purchase decisions. More importantly, based on the strength of the reviews that they read, 41% of restaurant review readers subsequently visited a restaurant, and 40% of hotel review readers subsequently stayed at a hotel. Furthermore, (Litvin et al., 2008) point out that interpersonal influence and word-of-mouth (WOM) are ranked as the most important information source when a consumer is making a purchase decision. These influences are especially important in the hospitality and tourism industry, whose intangible products are difficult to evaluate prior to their consumption. In tourism industry, you can only judge the service quality after you finish your trip. In this case, other consumers' review or recommendations become more critical and useful.

On the other hand, negative reviews also significantly impact the decision-making process of the consumers. For instance, (Sparks & Browning, 2011) explain that consumers seem to be more influenced by early negative information, especially when the overall set of reviews is negative. Also, (Maheswaran & Meyers-Levy, 1990) showed that negative information may therefore be considered more useful or diagnostic for decision making purposes and is consequently given greater weight than positive information. When the decision-making process is focused on the content of the message, such as the quality of information, negative framing is more effective than positive framing. However, positively framed information, together with numerical rating details, increases both booking intentions and consumer trust. The study highlights that the

recent positive reviews can override or moderate the effect of a set of negative reviews with respect to booking intentions. (Pitta & Fowler, 2005) argued that customers' voluntary and liberal reviews that are open to the anonymous public on the Internet are powerful avenues of WOM, due to their capabilities to spread to a multitude of prospective customers in a few clicks. Today, customers obtain travel-related information from the Internet more often than ever before and they also collect others' first-hand experiential reviews of particular hospitality offerings before making their final purchase decisions.

2.5 The source of the online review

Internet has become a popular platform for people to express themselves or to comment on their purchased products. Every day, lots of people are reviewing their purchased products or service. And they are the important source of the online review. (Lee et al., 2008) indicated that the source of online consumer reviews is a group of anonymous Internet-savvy individuals who like to post online messages. There is a far greater abundance of online consumer reviews than traditional reviews in the offline world. Furthermore, online consumer reviews are highly effective and can reach far beyond the local community through the Internet. Online consumer reviews are also easy to observe and the number of people who recommend a product can be easily counted. (Lee et al., 2008) examined the source of the online recommendation or review (seller vs buyer). They concluded that the recommendations of other consumers influence the choices of subjects more effectively than recommendations from an expert.

2.6 Comparison between consumer reviews and editor reviews

Many opinions on the different impact from the consumer reviews and editor or expert reviews have been addressed by researchers in the academia. The topic has been discussed a lot in the field. For instance, (Zhang, Ye, Law, & Li, 2010) indicated that consumer-generated ratings about the quality of food, environment and service of restaurants, and the volume of online consumer reviews are positively associated with the online popularity of restaurants; whereas editor reviews have a negative relationship with consumers' intention to visit a restaurant's webpage. Previous studies have also indicated that in traditional media such as magazines and newspapers, editor reviews have a significant influence on the popularity of products. (Sorensen

& Rasmussen, 2004) investigated the effect of reviews in the New York Times Book Review on sales of 175 hardcover fiction titles and found that even negative reviews increased sales, albeit positive reviews had a much larger impact, particularly for new authors. The continuing success of online communication sites (e.g., TripAdvisor.com, wheretostay.com, Zoomandgo.com, etc.) is indicative of widespread use of these sites by customers and, consequently, by managers who are conscious of market responses to their company's performance. Moreover, the "voluntary" reviews posted on these sites are believed to be much more valuable and trustworthy than typical survey-based customer responses in that they are based on the customer's free and voluntary opinions about what he or she experienced and that they are neither elicited nor framed by the company or researchers (Jeong & Mindy Jeon, 2008).

2.7 The effect of online reviews on product sales

Do the online reviews really impact the product sales? In academia, researchers have different opinions on the effect of online reviews on product sales. (Dellarocas, 2003; Liu, 2006; Ye, Law, Gu, & Chen, 2011) indicated that there is a positive relationship between average reviews scores and product sales. (Chevalier & Mayzlin, 2006) also compared the book sales of Amazon.com and Barnesandnoble.com, and found online reviews have positive effect on book sales on both sites. (Hu, Liu, & Zhang, 2008) show that consumers understand the value difference between favourable news and unfavourable news and respond accordingly. Furthermore, when consumers read online reviews, they pay attention not only to review scores but to other contextual information such as a reviewer's reputation and reviewer exposure. The market responds more favourably to reviews written by reviewers with better reputation and higher exposure. Finally, they demonstrate that the impact of online reviews on sales diminishes over time. Besides, (Jun, Vogt, & MacKay, 2010; Yacouel & Fleischer, 2012) argue that the EWOM is a significant source of information for companies and increasingly influences their marketing strategies. Companies who well manage EWOM can have a competitive advantage, directing their actions to specific targets according to the type of the product, as well as influencing clients who could be potentially loyal to their brand, while at the same time maintaining current clients. (Yacouel & Fleischer, 2012) claimed that online travel agents such as booking.com play an important role in building hotel reputation and encourage hoteliers to put

efforts into service quality. Empirical evidence showed that information supplied by past guests through the online travel agents generates a price premium for hotels with good reputations. However, in the movie industry, (Duan et al., 2008) argue that there is no significant relationship between movie's average rating and movie revenue through using data from movie box office. Also, (Ravid & Basuroy, 2004) find that both positive and negative reviews are correlated with weekly box office revenues over an 8-week period. However, the impact of negative reviews (but not that of positive reviews) diminishes over time. Similarly, critical reviews correlate with late and cumulative box office receipts but do not have a significant correlation with early box office receipts (Eliashberg & Shugan, 1997). (Clemons, Gao, & Hitt, 2006) show that the variance of ratings and the strength of the most positive quartile of reviews play a significant role in determining which new products grow fastest in the marketplace.

2.8 Word-of-mouth in the hospitality and tourism industry

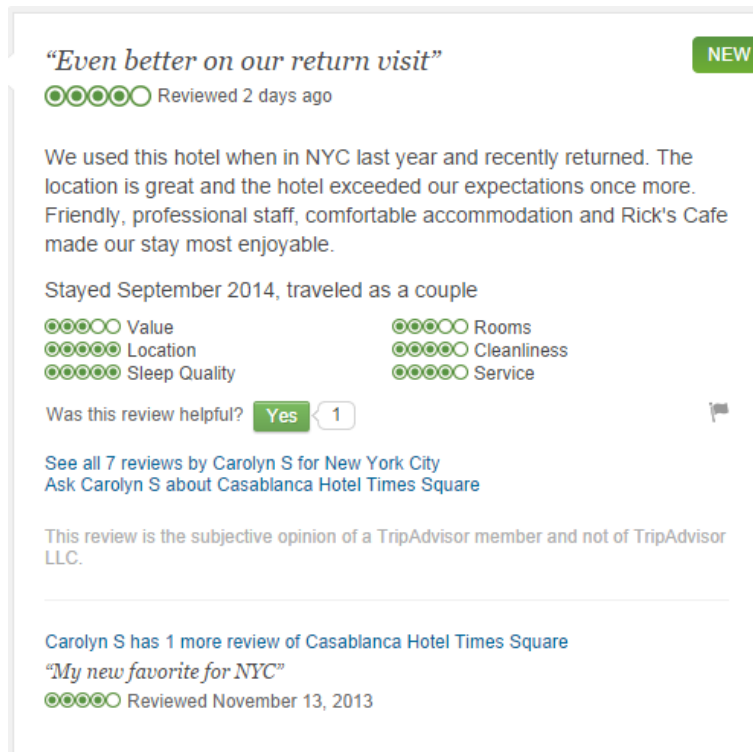
What about the impact of word-of-mouth in the hospitality and tourism industry? Since this is an intangible product, reviews are highly subject to their service level. (Ye, Law, & Gu, 2009) in their study showed that positive online reviews can significantly increase the number of bookings in a hotel, and the variance or polarity of WOM for the reviews of a hotel had a negative impact on the amount of online sales. The results further suggested that a 10% improvement in reviewers' rating can increase sales by 4.4% and a 10% increase in review variance can decrease sales by 2.8%. (Vermeulen & Seegers, 2009) applied consideration set theory to model the impact of online hotel reviews on consumer choice. An experimental study (N=168) that includes review valence (positive vs. negative reviews), hotel familiarity (well-known vs. lesser known hotels), and reviewer expertise (expert vs. non-expert reviewers) as independent factors shows that on average, exposure to online reviews enhances hotel consideration in consumers. This is because positive as well as negative reviews increase consumer awareness of hotels, whereas positive reviews, in addition, improve attitudes toward hotels. These effects are stronger for lesser-known hotels. Reviewer expertise has only a minor – positive – influence on review impact. (Li, Ye, & Law, 2013) illustrated that determinants of customer satisfaction in hospitality venues can be identified through an analysis of online reviews. Using text mining and content analysis of 42,668 online traveler reviews covering 774

star-rated hotels, the study found that transportation convenience, food and beverage management, convenience to tourist destinations and value for money are identified as excellent factors that customers booking both luxury and budget hotels consider important and for which the performance is much satisfactory to them. (Ye et al., 2011) concluded that valence of traveler reviews had a significant impact on the online sales of hotel rooms. Online reviews may serve to reduce the cognitive load of potential travelers, and thus increase their awareness, resulting in more sales. Their regression estimates suggested that, generally, a 10 percent increase in the ratings of user reviews can boost the dependent variable, index of online hotel bookings, by more than five percent. The results also indicated that the variance in the valence of rating scores across reviews does not significantly influence the number of online bookings. In terms of other influential factors for online sales, as the control variable in the research model, they found that room rate has a significantly negative effect on the average number of online bookings, and that hotels in larger cities tend to receive more online bookings. (Ye, Li, Wang, & Law, 2014) demonstrated that price has a significant effect on the evaluation of perceived quality and value, based on a data set of online traveler reviews. The regression estimates reported here suggest that price has a negative effect on the evaluation of perceived value, although four components of perceived service quality can have a positive impact. These results also indicate that price plays a positive role in a reviewer's ratings of perceived quality. In terms of factors moderating these relationships, price has a more significant impact on perceptions of quality for higher-star hotels than economy establishments. Additionally, it does not have a significant influence on perceived quality for leisure customers but does affect business travelers' ratings. The hospitality industry is increasingly dependent upon WOM by enabling customers to share their consumption experiences with prospective customers and service providers through various online communication channels. In particular, when purchasing a new product or service, customers tend to turn to this mode of communication channel as a more reliable source of information (Folkes, 1984). With varied formats of CGM, the hospitality industry is becoming more open minded about listening to customers' unfiltered and candid experiences with its offerings. In doing so the industry immediately addresses issues and acts appropriately to establish a lifelong relationship with its customers. (Jeong & Mindy Jeon, 2008) indicated that value was one of the key predictors for guest satisfaction, which leads to return intentions. Regardless of hotel classes and average daily rate, location appeared to have the highest mean value among seven

performance attributes. Obviously, hotel classes (i.e., star ratings) and average daily rate appeared to influence the relationships of selected hotel performance attributes with both overall guest satisfaction and return intentions. Many researchers have addressed this topic in the academia while I will conduct some statistical research on a perspective which has not been touched before. I will conduct a comprehensive statistical research on the topic on this field in the following chapters. The research hypotheses will be proposed in the next section.

2.9 Research Hypotheses

Figure 2.1 Customer Review



Tripadvisor.com adopts detailed ratings as a supplement to an overall score, in an attempt to reflect consumers' review more clearly. Furthermore, different customer groups have been classified, namely, Family, Business, Friend, Solo, Couple and Not specified. In this thesis, I will conduct some research analysis in this perspective, which is little known on it. Previous studies focused on the relationship between hotel online review and customer return intentions or online

bookings, but little has been known that different consumer groups may have significantly different opinions in terms of the hotel online review.

In prior studies, (Knutson, 1988) examined the expectations and use patterns relative to hotel services and room amenities of 1,853 frequent travelers who stay predominantly in one of the three major hotel segments: economy, mid-price, luxury. Results from the mail survey show distinct contrasts among the three groups. Economy travelers have extremely low expectations and relatively high use patterns. Mid-price travelers have moderate levels of both expectations and use. Luxury travelers have very high expectations and much lower use patterns. Findings also suggest that the economy segment tends to have many small bundles of expectations, whereas luxury travelers have few, but large bundles of expectations. Also, (Ananth, DeMicco, Moreo, & Howey, 1992) suggested that several attributes are important to all travelers, and that significant attribute differences between mature and younger travelers also exist. The findings of this study indicate that differences were present among the attributes sought by mature travelers and those sought by younger travelers. Besides, (Chow, Garretson, & Kurtz, 1995) showed purchase decision process used by leisure travelers in the selection of hotel accommodations is quite complex. The research, although exploratory in nature, empirically investigates the relationships among various cues hypothesized to impact purchase decisions. Cues used by leisure travelers in the evaluation of the more "intangible" purchase criteria of security, dependability; service quality, convenience, and reputation were identified. Based on the findings, the authors identified marketing and promotional strategies appropriate for retaining current customers and attracted new customers. (Choi & Chu, 1999) identified travellers' perceptions of quality of hotel services and facilities among three hotel categories in Hong Kong: High-Tariff A, High-Tariff B and Medium-Tariff hotels. Using a factor analysis technique, the study generated seven hotel factors from 33 hotel attributes identified by the hotel guests. The seven hotel factors were 'Staff Service Quality', 'Room Quality', 'General Amenities', 'Business Service', 'Value', 'Security' and 'IDD Facilities'. Results of ANOVA indicated that the ranking of the seven hotel factors was significantly different in the three hotel categories. Travellers' mean ratings of their perceptions of hotel factors increased positively, according to the higher hotel category. The finding is typical, in the sense that when people pay more, they expect to get better quality services. The two most important hotel factors perceived by guests of High-Tariff

A and High-Tariff B hotels were 'Room Quality' and 'Staff Service Quality', while the top priority for hotel guests staying at Medium-Tariff hotels was 'Security'.

In this study, I will seek to extend previous research by addressing the gaps in the understanding of review conducted by different customer groups (Family Business Solo Friend Couple).

Therefore, I assume that individual experience will be influenced by the type of trip travelers. Thus, I purposed seven hypotheses as follows:

Hypothesis 1: There exist significant mean differences among different customer groups in terms of six individual ratings and overall rating. (Family, Business, Friend, Solo, and Couple)

Hypothesis 2a: For independent hotels, there exist significant mean differences in terms of six individual ratings and overall rating among different customer groups.

Hypothesis 2b: For chain hotels, there does NOT exist significant mean differences in terms of six individual ratings and overall rating among different customer groups.

Hypothesis 3a: For 2-3 star hotels, there exist significant mean differences in terms of six individual ratings and overall rating among different customer groups.

Hypothesis 3b: For 4-5 star hotels, there does NOT exist significant mean differences in terms of six individual ratings and overall rating among different customer groups.

Hypothesis 4: Chain hotels make better performance than independent hotels in overall rating and six individual rating among different customer groups.

Hypothesis 5: 4-5 star hotels make better performance than 2-3 star hotels in overall rating and six individual rating among different customer groups.

Researchers have done some research to figure out the review difference between business and leisure tourism purpose group. But in my thesis, I did a comprehensive statistical research from the different customer group perspective. This is the very first time for researchers to analyze to see if there is any taste difference among different customer groups. Through testing hypotheses 1, 2a, 2b, 3a, 3b, we can acquire that whether significant mean differences exists among different

customer groups in terms of six individual ratings and overall rating. (Family, Business, Friend, Solo, and Couple)

Pattern differences between independent and chain hotels and between 2-3 star and 4-5 star hotels will be displayed through testing hypotheses 4 and hypotheses 5. By then, I can figure it out that whether independent hotels are making better performance than chain hotels or chain hotels are performing better than independent hotels. Also, we will know 2-3 star hotels' performance and 4-5 star hotels' performance.

Besides, a regression model was established in the Chapter 3. Regression analyses were conducted then to find out the six individual review rating and hotel star's weights account for the overall rating. By do this; we can acquire the rank of the six individual rating in terms of the importance.

Chapter 3 Research Methodology

This chapter started with the description of the data sets collected from Tripadvisor.com and followed by a series of statistical analyses including Reliability analysis, ANOVA, Regression analysis and Correlation analysis. In terms of the scope of the research, the analyses results and implications might only be applicable to this specific case as the data set, which is extracted from New York City of the only one online source. In this regard, potential bias might exist. Then, hypotheses were tested and regression model was proposed. Some conclusions and implications have been summarized in the chapter conclusion section at the end of this chapter.

3.1 Description of Data Sets

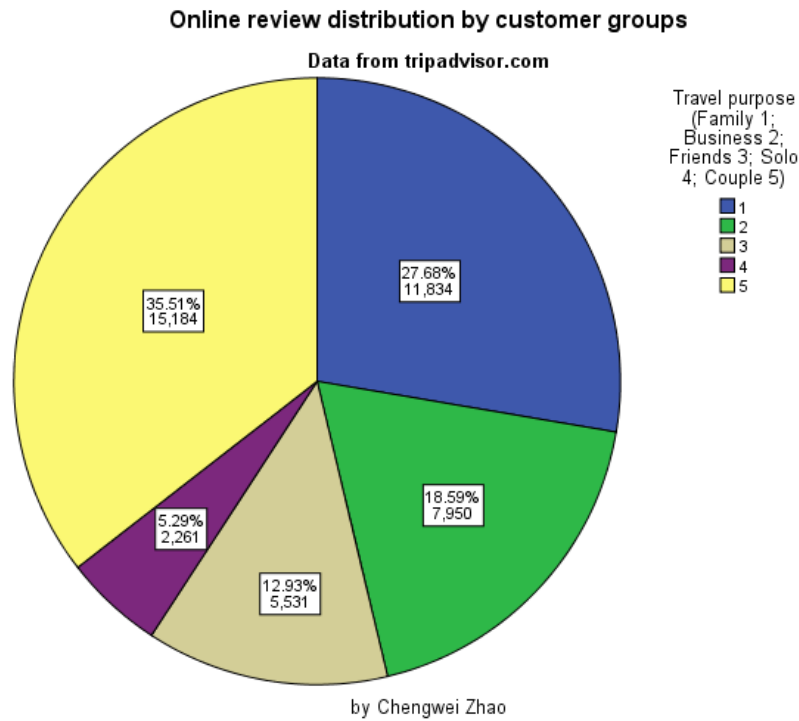
In terms of data sets, I chose the City Center area in New York City to conduct the empirical study. The reason to choose NYC as a destination for this study was that NYC is a world renowned metropolitan city where both business and leisure traveler markets equally attract hotel guests all year around. Due to the frequent updates of the Website, this study set the time frame to collect guests' reviews from December 2013 through December 2014. The data used in this empirical study were obtained from Tripadvisor.com. A Java program was developed to collect data for this study in December 2014. At the time of data collection, 458 star-rated hotels in New York had been registered on Tripadvisor. With limited resources, the city center area was selected to do research. In the City Center area, there are 219 hotels totally. For the research purpose, we chose hotels which contain more than one year review data, as a consequence, 143 hotels were chosen, including 7 five-star, 79 four-star, and 50 three-star and 7 two-star hotel. However, not all the data were available for analysis due to missing values. We collected the following data for each review as it appeared on the website: Overall rating, Value, Location, Sleep Quality, Room, Cleanness, Service, Star Type and Trip Type.

Table 3.1 provides the data description for this sample.

Table3.1 Description of Variables

Overall Rating	Reviewer’s overall evaluation of the hotel
Value Rating	The overall reviewer rating of Value
Location Rating	The overall reviewer rating of location
Sleep Quality Rating	The overall reviewer rating of sleep quality
Room Rating	The overall reviewer rating of room
Cleanness Rating	The overall reviewer rating of cleanness
Service Rating	The overall reviewer rating of service
Hotel Star Type	The star rating of a hotel
Trip Type	Travel purpose(Family 1; Business 2; Friends 3; Solo 4; Couple 5)

Figure 3.1 Online Review Distribution



3.2 Reliability Analysis

Cronbach's alpha is popularly used as an estimate of the reliability of a psychometric test in statistics. Also, it is the most common measure of internal consistency ("reliability"). Cronbach's alpha simply provides you with an overall reliability coefficient for a set of variables. In other words, the coefficient of Cronbach's alpha can tell us whether the six individual variables are evaluating the same one target.

Next, I will conduct reliability analysis before all the other statistical analyses. In this case, within total 46663 reviews, we have 23423 valid reviews; another 23240 reviews were excluded due to the missing reason.

Table 3.2a Case Processing Summary

		N	%
Cases	Valid	23423	50.2
	Excluded ^a	23240	49.8
	Total	46663	100.0

a. Listwise deletion based on all variables in the procedure.

The first important table is the Reliability Statistics table that provides the actual value for Cronbach's alpha, as shown below:

Table 3.2b Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.920	.917	7

From our table, we can see that Cronbach's alpha is 0.920, which indicates a high level of internal consistency for our scale with this specific topic.

The Item-Total Statistics table presents the "Cronbach's Alpha if Item Deleted" in the final column, as shown below:

Table 3.2c Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Value	26.127	20.280	.787	.636	.904
Location	25.480	25.615	.476	.228	.931
Sleep Quality	25.914	21.095	.749	.577	.908
Rooms	26.056	20.360	.813	.689	.901
Cleanliness	25.774	21.667	.776	.612	.905
Service	25.882	20.559	.775	.659	.905
Overall	25.977	19.941	.887	.802	.893

The last column presents the value that Cronbach's alpha would be if that particular item was deleted from the scale. We can see that removal of any items, except location, would result in a lower Cronbach's alpha. Therefore, we would not want to remove these items. Removal of location would lead to a small improvement in Cronbach's alpha.

3.3 ANOVA

In this part of my thesis, I decided to employ ANOVA to examine whether there are significant mean differences in terms of overall review and individual review among different customer groups. Many researchers have examined the review score mean differences between chain and independent hotels, high star and low star hotels, most popular and less popular hotel. But few researchers have studied the review score mean differences among different customer perspectives. In chapter 3, I will conduct a series of ANOVA analyses to examine whether there is significant review score mean differences among different customer groups in terms of all individual review item and overall rating and where exactly exist the mean difference.

3.3.1 Overall rating

Figure 3.2 Mean of Overall

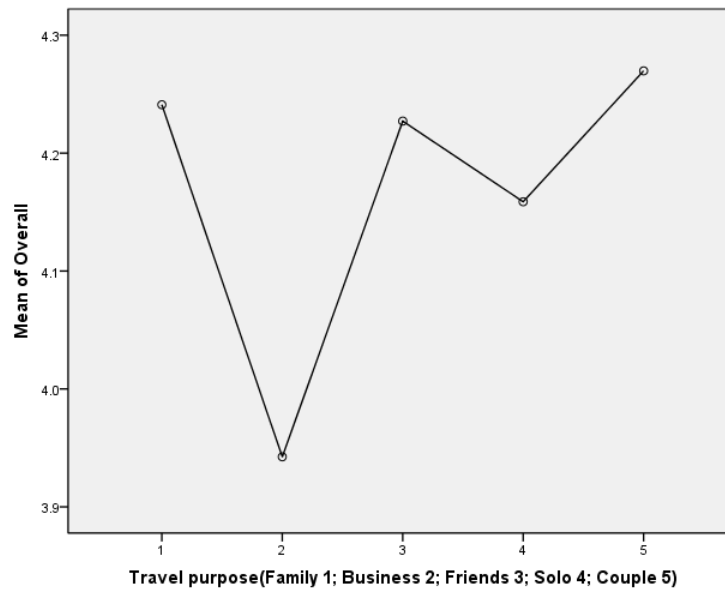


Table 3.3a Descriptives

Overall

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
1	11831	4.241	.9679	.0089	4.224	4.259
2	7943	3.942	1.1241	.0126	3.918	3.967
3	5530	4.227	.9648	.0130	4.202	4.253
4	2261	4.159	.9902	.0208	4.118	4.200
5	15181	4.270	.9438	.0077	4.255	4.285
Total	42746	4.190	.9986	.0048	4.180	4.199

The descriptive statistics associated with overall rating across the five customer groups are reported in Table 3.3a. It can be seen that the lowest review score customer group is business customer with numerically smallest mean level of review ($M = 3.942$, $SD = 1.1241$) and the highest review score customer group is couple customer with highest mean level of review ($M = 4.270$, $SD = 0.9986$).

Table 3.3b Test of Homogeneity of Variances

Overall

Levene Statistic	df1	df2	Sig.
54.217	4	42741	.000

As shown in the table 3.3b, the p-value of Test of Homogeneity of Variances is 0.000, which is less than 0.05, meaning that Homogeneity of Variances was rejected.

Table 3.3c ANOVA

Overall

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	623.902	4	155.975	158.726	.000
Within Groups	42000.322	42741	.983		
Total	42624.224	42745			

This is the table that shows the output of the ANOVA analysis and whether we have a statistically significant difference between our group means. In order to test the hypothesis, ANOVA was performed which yielded a statistically significant effect, $F = 158.726$, $P\text{-value} = .000$. Thus, the null hypothesis of no significant differences among the five customer groups was rejected. We might conclude that there existed significant mean differences among the five customer groups in terms of overall rating. This is great to know, but we do not know which of the specific groups differed. However, we can find this out in the Multiple Comparisons table which contains the results of post-hoc tests.

Table 3.3d Robust Tests of Equality of Means

Overall

	Statistic ^a	df1	df2	Sig.
Welch	132.202	4	11532.520	.000
Brown-Forsythe	155.211	4	23276.434	.000

a. Asymptotically F distributed.

Although the p-value of Test of Homogeneity of Variances shown in the table 3.3b is 0.000, which is less than 0.05, meaning that Homogeneity of Variances was rejected. Through the Robust Tests of Equality of Means, as shown in the table 3.3d, we are confident that there are significant mean differences among the five customer group.

Table 3.3e Multiple Comparisons

Overall

Games-Howell

		Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
1,2,3,4,5	1,2,3,4,5				Lower Bound	Upper Bound
1	2	.2986*	.0154	.000	.256	.341
	3	.0139	.0157	.902	-.029	.057
	4	.0823*	.0226	.003	.020	.144
	5	-.0287	.0117	.104	-.061	.003
2	1	-.2986*	.0154	.000	-.341	-.256
	3	-.2847*	.0181	.000	-.334	-.235
	4	-.2163*	.0243	.000	-.283	-.150
	5	-.3273*	.0148	.000	-.368	-.287
3	1	-.0139	.0157	.902	-.057	.029
	2	.2847*	.0181	.000	.235	.334
	4	.0683*	.0245	.043	.001	.135
	5	-.0426*	.0151	.038	-.084	-.002
4	1	-.0823*	.0226	.003	-.144	-.020
	2	.2163*	.0243	.000	.150	.283

	3	-.0683*	.0245	.043	-.135	-.001
	5	-.1110*	.0222	.000	-.172	-.050
5	1	.0287	.0117	.104	-.003	.061
	2	.3273*	.0148	.000	.287	.368
	3	.0426*	.0151	.038	.002	.084
	4	.1110*	.0222	.000	.050	.172

*. The mean difference is significant at the 0.05 level.

To evaluate the nature of the differences among the five customer groups further, the follow up Post-Hoc test (Games-Howell) was conducted. As displayed in the Table 3a, business customer group (M = 3.942, SD = 1.1241) has significant review score mean differences with all the other customer groups. Significant mean differences existed between family customer group (M = 4.241, SD = 0.9679) and solo customer group (M = 4.159, SD = 0.9902) while didn't exist significant mean differences between family customer group and friend customer group (M = 4.227, SD = 0.9648) and couple customer group (M = 4.270, SD = 0.9438). Finally, there are significant mean differences between friend customer group and solo customer group and couple customer group.

3.3.2 Value rating

Figure 3.3 Mean of Value

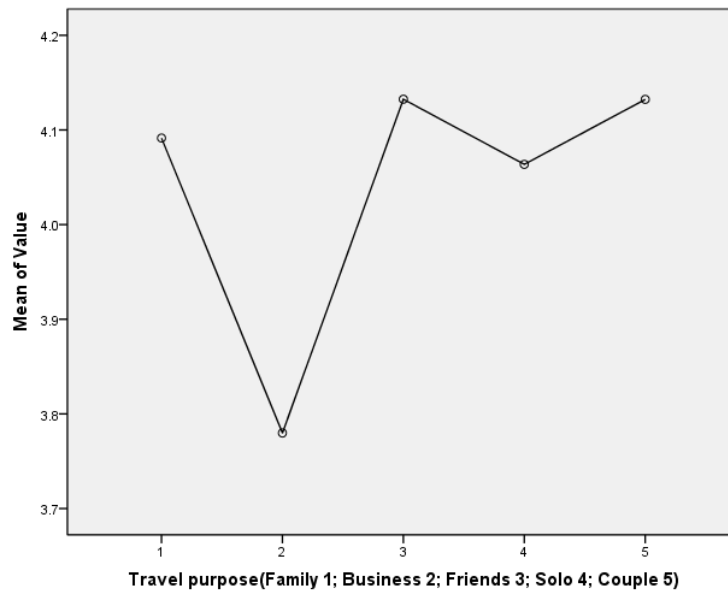


Table 3.4a Descriptives

Value	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
1	8597	4.091	1.0265	.0111	4.070	4.113
2	5973	3.780	1.1456	.0148	3.751	3.809
3	4017	4.132	1.0262	.0162	4.101	4.164
4	1633	4.064	1.0377	.0257	4.013	4.114
5	11068	4.132	1.0019	.0095	4.114	4.151
Total	31288	4.050	1.0508	.0059	4.039	4.062

The descriptive statistics associated with value rating across the five customer groups are reported in Table 3.4a. It can be seen that the lowest review score customer group is business customer with numerically smallest mean level of review (M = 3.780, SD = 1.1456) and the highest review score customer group are friend and couple customer group with highest mean level of review (M = 4.132, SD = 1.0262, SD = 1.0019).

Table 3.4b Test of Homogeneity of Variances

Value	Levene Statistic	df1	df2	Sig.
	63.281	4	31283	.000

As shown in the table 3.4b, the p-value of Test of Homogeneity of Variances is 0.000, which is less than 0.05, meaning that Homogeneity of Variances was rejected.

Table 3.4c ANOVA

Value	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	553.215	4	138.304	127.286	.000
Within Groups	33990.903	31283	1.087		
Total	34544.119	31287			

This is the table that shows the output of the ANOVA analysis and whether we have a statistically significant difference between our group means. In order to test the hypothesis, ANOVA was performed which yielded a statistically significant effect, $F = 127.286$, $P\text{-value} = .000$. Thus, the null hypothesis of no significant differences among the five customer groups was rejected. We might conclude that there existed significant mean differences among the five customer groups in terms of value rating. This is great to know, but we do not know which of the specific groups differed. However, we can find this out in the Multiple Comparisons table 3.4e which contains the results of post-hoc tests.

Table 3.4d Robust Tests of Equality of Means

Value

	Statistic ^a	df1	df2	Sig.
Welch	110.671	4	8398.635	.000
Brown-Forsythe	125.352	4	17042.566	.000

a. Asymptotically F distributed.

Although the p-value of Test of Homogeneity of Variances shown in the table 3.4b is 0.000, which is less than 0.05, meaning that Homogeneity of Variances was rejected. Through the Robust Tests of Equality of Means, as shown in the table 3.4d, we are confident that there are significant mean differences among the five customer group.

Table 3.4e Multiple Comparisons

Value

Games-Howell

1,2,3,4,5	1,2,3,4,5	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	.3116*	.0185	.000	.261	.362
	3	-.0410	.0196	.224	-.095	.013
	4	.0277	.0280	.859	-.049	.104
	5	-.0408*	.0146	.041	-.081	-.001
2	1	-.3116*	.0185	.000	-.362	-.261
	3	-.3526*	.0220	.000	-.412	-.293
	4	-.2838*	.0297	.000	-.365	-.203
	5	-.3524*	.0176	.000	-.400	-.304
3	1	.0410	.0196	.224	-.013	.095

	2	.3526*	.0220	.000	.293	.412
	4	.0688	.0304	.157	-.014	.152
	5	.0002	.0188	1.000	-.051	.051
4	1	-.0277	.0280	.859	-.104	.049
	2	.2838*	.0297	.000	.203	.365
	3	-.0688	.0304	.157	-.152	.014
	5	-.0686	.0274	.090	-.143	.006
5	1	.0408*	.0146	.041	.001	.081
	2	.3524*	.0176	.000	.304	.400
	3	-.0002	.0188	1.000	-.051	.051
	4	.0686	.0274	.090	-.006	.143

*. The mean difference is significant at the 0.05 level.

To evaluate the nature of the differences among the five customer groups further, the follow up Post-Hoc test (Games-Howell) was conducted. As displayed in the Table 3.4e, business customer group ($M = 3.780$, $SD = 1.1456$) has significant review score mean differences with all the other customer groups. Significant mean differences existed between family customer group ($M = 4.091$, $SD = 1.0265$) and couple customer group ($M = 4.132$, $SD = 1.0019$) while didn't exist significant mean differences between family customer group and friend customer group ($M = 4.132$, $SD = 1.0262$) and solo customer group ($M = 4.064$, $SD = 1.0377$). Finally, there are significant mean differences between friend customer group and solo customer group and couple customer group.

3.3.3 Location rating

Figure 3.4 Mean of Location

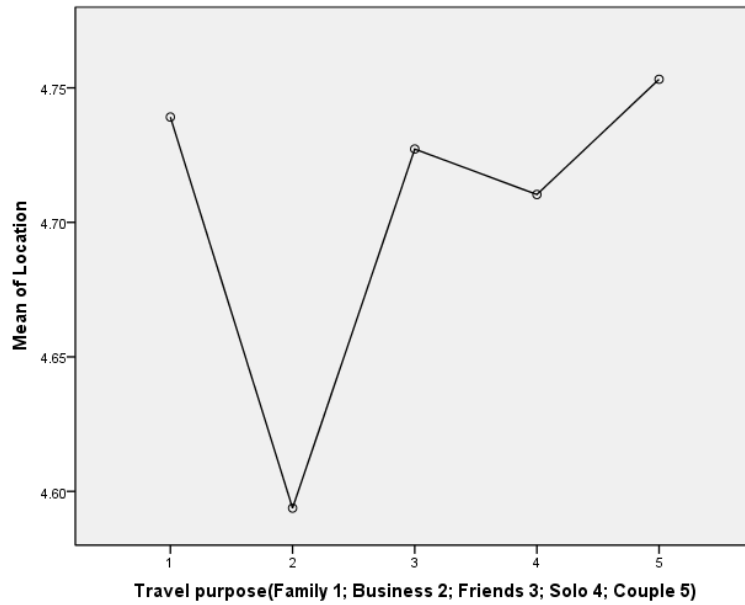


Table 3.5a Descriptives

Location	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
1	8587	4.739	.5632	.0061	4.727	4.751
2	5965	4.594	.6712	.0087	4.577	4.611
3	4011	4.727	.5675	.0090	4.710	4.745
4	1671	4.710	.5800	.0142	4.683	4.738
5	11122	4.753	.5359	.0051	4.743	4.763
Total	31356	4.713	.5805	.0033	4.707	4.720

The descriptive statistics associated with location rating across the five customer groups are reported in Table 3.5a. It showed that the lowest review score customer group is business customer with numerically smallest mean level of review ($M = 4.594$, $SD = 0.6712$) and the highest review score customer group is couple customer group with highest mean level of review ($M = 4.753$, $SD = 0.5359$).

Table 3.5b Test of Homogeneity of Variances

Location			
Levene Statistic	df1	df2	Sig.
189.642	4	31351	.000

As shown in the table 3.5b, the p-value of Test of Homogeneity of Variances is 0.000, which is less than 0.05, meaning that Homogeneity of Variances was rejected.

Table 3.5c ANOVA

Location					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	109.413	4	27.353	82.005	.000
Within Groups	10457.380	31351	.334		
Total	10566.793	31355			

In order to test the hypothesis, ANOVA was performed which yielded a statistically significant effect, $F = 82.005$, $P\text{-value} = .000$. Thus, the null hypothesis of no significant differences among the five customer groups was rejected. We might conclude that there existed significant mean differences among the five customer groups in terms of location rating. This is great to know, but we do not know which of the specific groups differed. Luckily, we can find this out in the Multiple Comparisons table 3.5e which contains the results of post-hoc tests.

Table 3.5d Robust Tests of Equality of Means

Location				
	Statistic ^a	df1	df2	Sig.
Welch	66.053	4	8464.288	.000
Brown-Forsythe	79.295	4	17000.088	.000

a. Asymptotically F distributed.

Although the p-value of Test of Homogeneity of Variances shown in the table 3.5b is 0.000, which is less than 0.05, meaning that Homogeneity of Variances was rejected. Through the Robust Tests of Equality of Means, as shown in the table 3.5d, we are confident that there are significant mean differences among the five customer group.

Table 3.5e Multiple Comparisons

Location

Games-Howell

1,2,3,4,5	1,2,3,4,5	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	.1453*	.0106	.000	.116	.174
	3	.0119	.0108	.808	-.018	.041
	4	.0288	.0154	.337	-.013	.071
	5	-.0141	.0079	.389	-.036	.008
2	1	-.1453*	.0106	.000	-.174	-.116
	3	-.1335*	.0125	.000	-.168	-.099
	4	-.1166*	.0166	.000	-.162	-.071
	5	-.1594*	.0101	.000	-.187	-.132
3	1	-.0119	.0108	.808	-.041	.018
	2	.1335*	.0125	.000	.099	.168
	4	.0169	.0168	.852	-.029	.063
	5	-.0259	.0103	.087	-.054	.002
4	1	-.0288	.0154	.337	-.071	.013
	2	.1166*	.0166	.000	.071	.162
	3	-.0169	.0168	.852	-.063	.029
	5	-.0428*	.0151	.036	-.084	-.002
5	1	.0141	.0079	.389	-.008	.036
	2	.1594*	.0101	.000	.132	.187
	3	.0259	.0103	.087	-.002	.054
	4	.0428*	.0151	.036	.002	.084

*. The mean difference is significant at the 0.05 level.

To evaluate the nature of the differences among the five customer groups further, the follow up Post-Hoc test (Games-Howell) was conducted. As displayed in the Table 3.5e, business customer group ($M = 4.579$, $SD = 0.6712$) has significant review score mean differences with all the other customer groups. Significant mean differences didn't exist among the other customer groups except for between solo ($M = 4.710$, $SD = 0.5800$) and couple ($M = 4.753$, $SD = 0.5359$) where does exist significant mean differences.

3.3.4 Sleep Quality rating

Figure 3.5 Mean of Sleep Quality

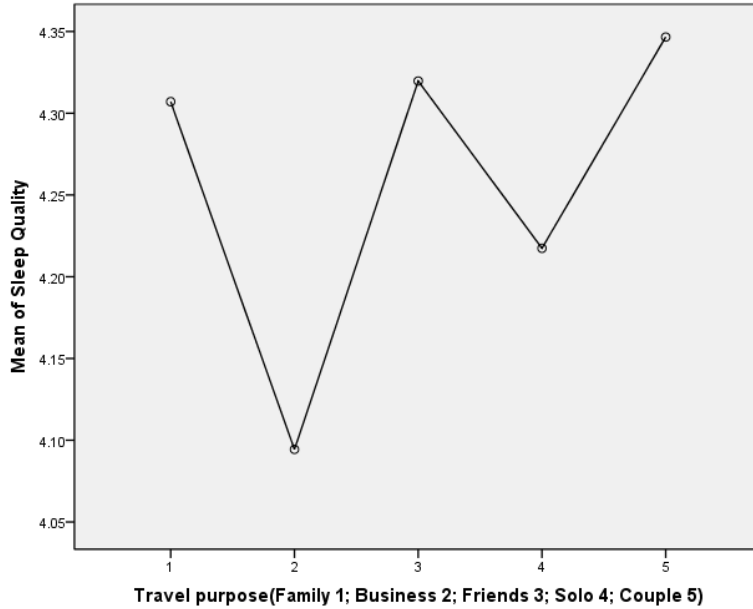


Table 3.6a Descriptives

Sleep Quality						
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
1	8601	4.307	.9572	.0103	4.287	4.327
2	5921	4.094	1.0623	.0138	4.067	4.121
3	4010	4.320	.9349	.0148	4.291	4.349
4	1665	4.217	.9998	.0245	4.169	4.265
5	11038	4.347	.9340	.0089	4.329	4.364
Total	31235	4.278	.9739	.0055	4.267	4.288

The descriptive statistics associated with sleep quality rating across the five customer groups are reported in Table 3.6a. It displayed that the lowest review score customer group is business customer with numerically smallest mean level of review ($M = 4.094$, $SD = 1.0623$) and the highest review score customer group is couple customer group with highest mean level of review ($M = 4.347$, $SD = 0.9340$).

Table 3.6b Test of Homogeneity of Variances

Sleep Quality

Levene Statistic	df1	df2	Sig.
18.407	4	31230	.000

As shown in the table 3.6b, the p-value of Test of Homogeneity of Variances is 0.000, which is less than 0.05, meaning that Homogeneity of Variances was rejected.

Table 3.6c ANOVA

Sleep Quality

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	271.886	4	67.971	72.312	.000
Within Groups	29355.554	31230	.940		
Total	29627.440	31234			

In order to test the hypothesis, ANOVA was performed which yielded a statistically significant effect, $F = 72.312$, $P\text{-value} = .000$. Thus, the null hypothesis of no significant differences among the five customer groups was rejected. We might conclude that there existed significant mean differences among the five customer groups in terms of sleep quality rating. This is great to know, but we do not know which of the specific groups differed. Luckily, we can find this out in the Multiple Comparisons table 3.6e which contains the results of post-hoc tests.

Table 3.6d Robust Tests of Equality of Means

Sleep Quality

	Statistic ^a	df1	df2	Sig.
Welch	64.064	4	8472.207	.000
Brown-Forsythe	70.607	4	16397.270	.000

a. Asymptotically F distributed.

Although the p-value of Test of Homogeneity of Variances shown in the table 3.6b is 0.000, which is less than 0.05, meaning that Homogeneity of Variances was rejected. Through the

Robust Tests of Equality of Means, as shown in the table 3.6d, we are confident that there are significant mean differences among the five customer group.

Table 3.6e Multiple Comparisons

Sleep Quality
Games-Howell

1,2,3,4,5	1,2,3,4,5	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	.2126*	.0172	.000	.166	.260
	3	-.0126	.0180	.956	-.062	.037
	4	.0896*	.0266	.007	.017	.162
	5	-.0396*	.0136	.030	-.077	-.002
2	1	-.2126*	.0172	.000	-.260	-.166
	3	-.2253*	.0202	.000	-.280	-.170
	4	-.1230*	.0281	.000	-.200	-.046
	5	-.2522*	.0164	.000	-.297	-.207
3	1	.0126	.0180	.956	-.037	.062
	2	.2253*	.0202	.000	.170	.280
	4	.1023*	.0286	.003	.024	.180
	5	-.0269	.0172	.522	-.074	.020
4	1	-.0896*	.0266	.007	-.162	-.017
	2	.1230*	.0281	.000	.046	.200
	3	-.1023*	.0286	.003	-.180	-.024
	5	-.1292*	.0261	.000	-.200	-.058
5	1	.0396*	.0136	.030	.002	.077
	2	.2522*	.0164	.000	.207	.297
	3	.0269	.0172	.522	-.020	.074
	4	.1292*	.0261	.000	.058	.200

*. The mean difference is significant at the 0.05 level.

To evaluate the nature of the differences among the five customer groups further, the follow up Post-Hoc test (Games-Howell) was conducted. As displayed in the Table 3.6e, business customer group (M = 4.094, SD = 1.0623) has significant review score mean differences with all the other customer groups. Significant mean differences existed between family customer group (M = 4.307, SD = 0.9572) and solo (M = 4.217, SD = 0.9998) and couple customer group (M = 4.347, SD = 0.9340) while didn't exist significant mean differences between family customer group and

friend customer group (M = 4.320, SD = 0.9349). Finally, there are significant mean differences between solo customer group and friend and couple customer group while there is no significant difference between friend and couple customer group.

3.3.5 Rooms rating

Figure 3.6 Mean of Rooms

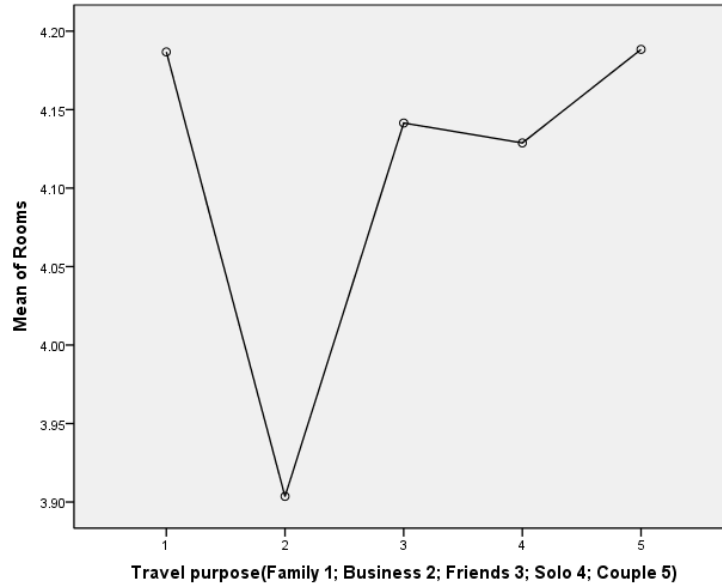


Table 3.7a Descriptives

Rooms						
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
1	8567	4.187	.9826	.0106	4.166	4.208
2	5965	3.904	1.1146	.0144	3.875	3.932
3	3937	4.141	1.0005	.0159	4.110	4.173
4	1654	4.129	.9996	.0246	4.081	4.177
5	11032	4.188	.9731	.0093	4.170	4.207
Total	31155	4.124	1.0149	.0057	4.113	4.136

The descriptive statistics associated with sleep quality rating across the five customer groups are reported in Table 3.7a. It can be clearly seen that the lowest review score customer group is

business customer with numerically smallest mean level of review ($M = 3.904$, $SD = 1.1146$) and the highest review score customer group is couple customer group with highest mean level of review ($M = 4.188$, $SD = 0.9731$).

Table 3.7b Test of Homogeneity of Variances

Rooms			
Levene Statistic	df1	df2	Sig.
33.384	4	31150	.000

As shown in the table 3.7b, the p-value of Test of Homogeneity of Variances is 0.000, which is less than 0.05, meaning that Homogeneity of Variances was rejected.

Table 3.7c ANOVA

Rooms					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	370.428	4	92.607	90.946	.000
Within Groups	31719.104	31150	1.018		
Total	32089.532	31154			

In order to test the hypothesis, ANOVA was performed which yielded a statistically significant effect, $F = 90.946$, $P\text{-value} = .000$. Thus, the null hypothesis of no significant differences among the five customer groups was rejected. We might conclude that there existed significant mean differences among the five customer groups in terms of rooms rating. This is great to know, but we do not know which of the specific groups differed. Luckily, we can find this out in the Multiple Comparisons table 3.7e which contains the results of post-hoc tests.

Table 3.7d Robust Tests of Equality of Means

Rooms				
	Statistic ^a	df1	df2	Sig.
Welch	78.542	4	8424.591	.000
Brown-Forsythe	89.542	4	17180.385	.000

a. Asymptotically F distributed.

Although the p-value of Test of Homogeneity of Variances shown in the table 3.7b is 0.000, which is less than 0.05, meaning that Homogeneity of Variances was rejected. Through the Robust Tests of Equality of Means, as shown in the table 3.7d, we are confident that there are significant mean differences among the five customer group.

Table 3.7e Multiple Comparisons

Rooms

Games-Howell

1,2,3,4,5	1,2,3,4,5	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	.2832*	.0179	.000	.234	.332
	3	.0453	.0192	.125	-.007	.098
	4	.0580	.0268	.193	-.015	.131
	5	-.0016	.0141	1.000	-.040	.037
2	1	-.2832*	.0179	.000	-.332	-.234
	3	-.2379*	.0215	.000	-.297	-.179
	4	-.2252*	.0285	.000	-.303	-.147
	5	-.2848*	.0171	.000	-.332	-.238
3	1	-.0453	.0192	.125	-.098	.007
	2	.2379*	.0215	.000	.179	.297
	4	.0127	.0293	.993	-.067	.093
	5	-.0469	.0184	.082	-.097	.003
4	1	-.0580	.0268	.193	-.131	.015
	2	.2252*	.0285	.000	.147	.303
	3	-.0127	.0293	.993	-.093	.067
	5	-.0596	.0263	.156	-.131	.012
5	1	.0016	.0141	1.000	-.037	.040
	2	.2848*	.0171	.000	.238	.332
	3	.0469	.0184	.082	-.003	.097
	4	.0596	.0263	.156	-.012	.131

*. The mean difference is significant at the 0.05 level.

To evaluate the nature of the differences among the five customer groups further, the follow up Post-Hoc test (Games-Howell) was conducted. As displayed in the Table 3.7e, business customer group (M = 3.904, SD = 1.1146) has significant review score mean differences with all the other customer groups. No significant mean differences existed among family customer group (M =

4.187, SD = 0.9826), friend (M = 4.141, SD = 1.0005), solo (M = 4.129, SD = 0.9996) and couple customer group (M = 4.188, SD = 0.9731).

3.3.6 Cleanliness rating

Figure 3.7 Mean of Cleanliness

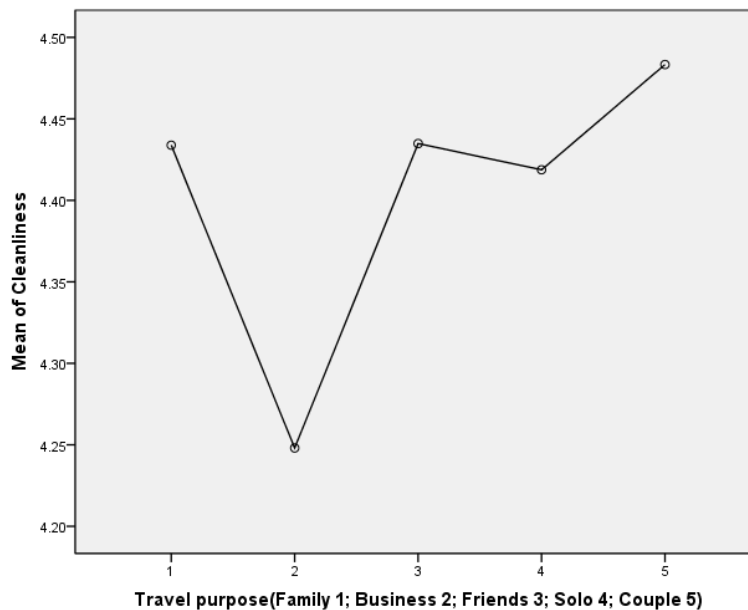


Table 3.8a Descriptives

Cleanliness

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
1	8683	4.434	.8600	.0092	4.416	4.452
2	5970	4.248	.9920	.0128	4.223	4.273
3	3937	4.435	.8601	.0137	4.408	4.462
4	1674	4.419	.8772	.0214	4.377	4.461
5	11034	4.483	.8334	.0079	4.468	4.499
Total	31298	4.415	.8826	.0050	4.405	4.425

The descriptive statistics associated with cleanliness rating across the five customer groups are reported in Table 3.8a. It can be seen that the lowest review score customer group is business customer with numerically smallest mean level of review (M = 4.248, SD = 0.9920) and the

highest review score customer group is couple customer group with highest mean level of review (M = 4.483, SD = 0.8334).

Table 3.8b Test of Homogeneity of Variances

Cleanliness			
Levene Statistic	df1	df2	Sig.
68.003	4	31293	.000

As shown in the table 3.8b, the p-value of Test of Homogeneity of Variances is 0.000, which is less than 0.05, meaning that Homogeneity of Variances was rejected.

Table 3.8c ANOVA

Cleanliness					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	222.514	4	55.628	72.062	.000
Within Groups	24156.763	31293	.772		
Total	24379.277	31297			

This is the table that shows the output of the ANOVA analysis and whether we have a statistically significant difference between our group means. In order to test the hypothesis, ANOVA was performed which yielded a statistically significant effect, $F = 127.286$, $P\text{-value} = .000$. Thus, the null hypothesis of no significant differences among the five customer groups was rejected. We might conclude that there existed significant mean differences among the five customer groups in terms of value rating. This is great to know, but we do not know which of the specific groups differed. However, we can find this out in the Multiple Comparisons table 3.8e which contains the results of post-hoc tests.

Table 3.8d Robust Tests of Equality of Means

Cleanliness				
	Statistic ^a	df1	df2	Sig.
Welch	61.353	4	8476.228	.000
Brown-Forsythe	70.517	4	17142.759	.000

a. Asymptotically F distributed.

Although the p-value of Test of Homogeneity of Variances shown in the table 3.8b is 0.000, which is less than 0.05, meaning that Homogeneity of Variances was rejected. Through the Robust Tests of Equality of Means, as shown in the table 3.8d, we are confident that there are significant mean differences among the five customer group.

Table 3.8e Multiple Comparisons

Cleanliness

Games-Howell

1,2,3,4,5	1,2,3,4,5	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	.1858*	.0158	.000	.143	.229
	3	-.0010	.0165	1.000	-.046	.044
	4	.0151	.0233	.967	-.049	.079
	5	-.0495*	.0122	.000	-.083	-.016
2	1	-.1858*	.0158	.000	-.229	-.143
	3	-.1868*	.0188	.000	-.238	-.136
	4	-.1707*	.0250	.000	-.239	-.102
	5	-.2353*	.0151	.000	-.276	-.194
3	1	.0010	.0165	1.000	-.044	.046
	2	.1868*	.0188	.000	.136	.238
	4	.0161	.0254	.970	-.053	.086
	5	-.0485*	.0158	.019	-.092	-.005
4	1	-.0151	.0233	.967	-.079	.049
	2	.1707*	.0250	.000	.102	.239
	3	-.0161	.0254	.970	-.086	.053
	5	-.0646*	.0229	.038	-.127	-.002
5	1	.0495*	.0122	.000	.016	.083
	2	.2353*	.0151	.000	.194	.276
	3	.0485*	.0158	.019	.005	.092
	4	.0646*	.0229	.038	.002	.127

*. The mean difference is significant at the 0.05 level.

To evaluate the nature of the differences among the five customer groups further, the follow up Post-Hoc test (Games-Howell) was conducted. As displayed in the Table 3.8e, business customer group (M = 4.248, SD = 0.9920) has significant review score mean differences with all the other customer groups. No significant mean differences existed between family customer group (M =

4.434, SD = 0.8600) and friend (M = 4.435, SD = 0.8601) and solo customer group (M = 4.419, SD = 0.8772) while does exist significant mean differences between family customer group and couple customer group (M = 4.483, SD = 0.8334). Finally, there are significant mean differences between couple customer group and friend, solo customer group while there is no significant difference between friend and solo customer group.

3.3.7 Service rating

Figure 3.8 Mean of Service

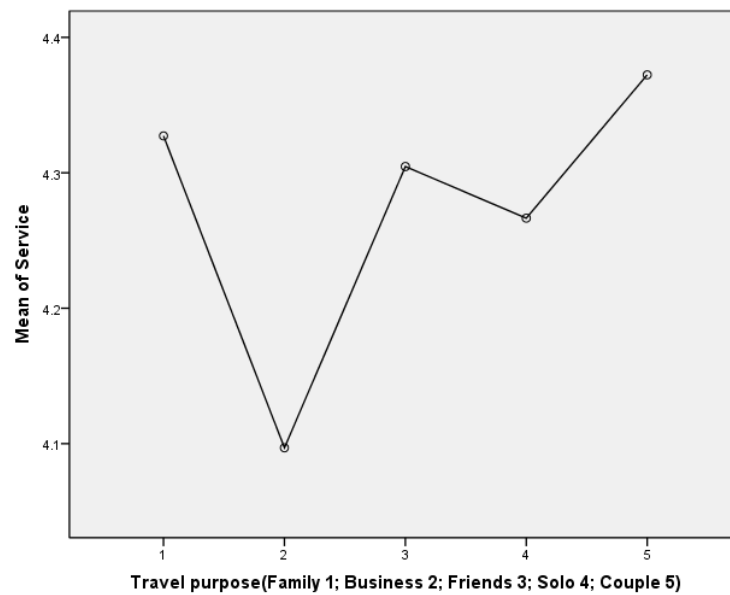


Table 3.9a Descriptives

Service	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
1	11786	4.327	1.0061	.0093	4.309	4.345
2	7900	4.097	1.1527	.0130	4.072	4.122
3	5499	4.305	1.0138	.0137	4.278	4.331
4	2244	4.266	1.0302	.0217	4.224	4.309
5	15121	4.372	.9710	.0079	4.357	4.388
Total	42550	4.294	1.0298	.0050	4.285	4.304

The descriptive statistics associated with service rating across the five customer groups are reported in Table 3.9a. It can be seen that the lowest review score customer group is business customer with numerically smallest mean level of review ($M = 4.097$, $SD = 1.1527$) and the highest review score customer group is couple customer group with highest mean level of review ($M = 4.372$, $SD = 0.9710$).

Table 3.9b Test of Homogeneity of Variances

Service			
Levene Statistic	df1	df2	Sig.
76.731	4	42545	.000

As shown in the table 3.9b, the p-value of Test of Homogeneity of Variances is 0.000, which is less than 0.05, meaning that Homogeneity of Variances was rejected.

Table 3.9c ANOVA

Service					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	414.828	4	103.707	98.681	.000
Within Groups	44711.730	42545	1.051		
Total	45126.558	42549			

In order to test the hypothesis, ANOVA was performed which yielded a statistically significant effect, $F = 98.681$, $P\text{-value} = .000$. Thus, the null hypothesis of no significant differences among the five customer groups was rejected. We might conclude that there existed significant mean differences among the five customer groups in terms of service rating. This is great to know, but we do not know which of the specific groups differed. However, we can find this out in the Multiple Comparisons table 3.9e which contains the results of post-hoc tests.

Table 3.9d Robust Tests of Equality of Means

Service				
	Statistic ^a	df1	df2	Sig.
Welch	84.714	4	11436.486	.000
Brown-Forsythe	95.980	4	22935.930	.000

Table 3.9d Robust Tests of Equality of Means

Service				
	Statistic ^a	df1	df2	Sig.
Welch	84.714	4	11436.486	.000
Brown-Forsythe	95.980	4	22935.930	.000

a. Asymptotically F distributed.

Although the p-value of Test of Homogeneity of Variances shown in the table 3.9b is 0.000, which is less than 0.05, meaning that Homogeneity of Variances was rejected. Through the Robust Tests of Equality of Means, as shown in the table 3.9d, we are confident that there are significant mean differences among the five customer group

Table 3.9e Multiple Comparisons

Service

Games-Howell

1,2,3,4,5	1,2,3,4,5	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	.2303*	.0159	.000	.187	.274
	3	.0227	.0165	.646	-.022	.068
	4	.0608	.0236	.076	-.004	.125
	5	-.0451*	.0122	.002	-.078	-.012
2	1	-.2303*	.0159	.000	-.274	-.187
	3	-.2076*	.0188	.000	-.259	-.156
	4	-.1695*	.0253	.000	-.239	-.100
	5	-.2754*	.0152	.000	-.317	-.234
3	1	-.0227	.0165	.646	-.068	.022
	2	.2076*	.0188	.000	.156	.259
	4	.0381	.0257	.573	-.032	.108
	5	-.0677*	.0158	.000	-.111	-.025
4	1	-.0608	.0236	.076	-.125	.004
	2	.1695*	.0253	.000	.100	.239
	3	-.0381	.0257	.573	-.108	.032
	5	-.1058*	.0231	.000	-.169	-.043
5	1	.0451*	.0122	.002	.012	.078
	2	.2754*	.0152	.000	.234	.317
	3	.0677*	.0158	.000	.025	.111

4	.1058*	.0231	.000	.043	.169
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*. The mean difference is significant at the 0.05 level.

To evaluate the nature of the differences among the five customer groups further, the follow up Post-Hoc test (Games-Howell) was conducted. As displayed in the Table 3.9e, business customer group (M = 4.097, SD = 1.1527) has significant review score mean differences with all the other customer groups. No significant mean differences existed between family customer group (M = 4.327, SD = 1.0061) and friend (M = 4.305, SD = 1.0138) and solo customer group (M = 4.419, SD = 0.8772) while does exist significant mean differences between family customer group and couple customer group (M = 4.266, SD = 1.0302). Finally, there are significant mean differences between couple customer group and friend, solo customer group while there is no significant difference between friend and solo customer group.

3.3.8 Conclusion

Hypothesis 1 is supported. There exist significant mean differences in terms of six individual ratings and overall rating among different customer groups (Family, Business, Friend, Solo, and Couple).

Implication: Though the analysis above, we can conclude that there exist significant mean differences in terms of six individual ratings and overall rating among different customer groups. This is definitely a meaningful implication for the hotel industry. Few researchers have studied in this aspect. But actually, this is very important since different customer groups have totally different taste and in consequence, totally different reviews will be given to some certain hotel. The result of this part has indicated that hotels should implement different measures to cater different customer groups in order to attract more different types of customers.

3.4 Empirical model & Regression analysis

The main purpose of the research in the hotel industry is to identify the influence of different individual review item on the people's intention to return to the certain hotel after reviewing their experience online. In this chapter, I would employ overall rating as a proxy of purchase

intention, which means that the intention that customer would like to return some certain hotel after reviewing online. Through this way, we might clearly see what the individual review impact on the purchase intention is.

$$\text{Overall Rating} = \beta_0 + \beta_1\text{Value} + \beta_2\text{Location} + \beta_3\text{SleepQuality} + \beta_4\text{Rooms} + \beta_5\text{Cleanliness} + \beta_6\text{Service} + \alpha_1\text{Star Rating} + \mu_1\text{OtherFactors} + \epsilon_1$$

In the model, Value and Location represent a specific reviewer’s value of a give hotel and the evaluation for the specific hotel’s location. Sleep Quality and Rooms mean a specific reviewer’s evaluation of sleep quality and comfort of a certain hotel. Cleanliness and Service stand for the cleanliness of the room of a specific hotel and service quality of the hotel.

In this section, I will only show you the three main tables required to understand your results from the linear regression procedure, assuming that no assumptions have been violated. More details will be explained in the text below.

3.4.1 Family group

Table 3.10a Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.891 ^a	.794	.794	.4339

a. Predictors: (Constant), Hotel Star , Service, Location, Sleep Quality, Cleanliness, Value, Rooms

b. Dependent Variable: Overall

Table 3.10b ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4653.952	7	664.850	3530.742	.000 ^a
	Residual	1208.907	6420	.188		
	Total	5862.859	6427			

a. Predictors: (Constant), Hotel Star , Service, Location, Sleep Quality, Cleanliness, Value, Rooms

b. Dependent Variable: Overall

Table 3.10c Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.450	.059		-7.683	.000
	Value	.191	.009	.203	22.292	.000
	Location	.077	.011	.045	7.011	.000
	Sleep Quality	.145	.009	.144	16.876	.000
	Rooms	.212	.010	.214	22.176	.000
	Cleanliness	.107	.010	.095	10.249	.000
	Service	.339	.008	.355	40.566	.000
	Hotel Star	.030	.010	.018	3.034	.002

a. Dependent Variable: Overall

The results of the regression analysis of model are presented in Table 3.10a 3.10b 3.10c. The analysis indicates a perfect fit, with a very high $R^2 = 0.794$ and significant likelihood ratio (sig. = .000). The coefficients are positive and significant. The unstandardized coefficient of service is .339, which is obviously the most important factor that positively impacts the overall rating as a proxy of the return intentions. It is followed by rooms (.212), value (.191), sleep quality (.145), cleanliness (.107) and location (.077). Through the analyses results, we might easily rank the importance of the different individual aspect which definitely helps hotels better allocate their resources to provide services to the customers. More importantly, I classify the data sets based on the five different customer groups. Then, I conducted the regression analyses separately since different customer group might have different rating opinion on the six individual rating items. So hotels could better cater to the different customer group with the more specific and meaningful intelligence information.

3.4.2 Business group

Table 3.11a Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.913 ^a	.834	.834	.4433

a. Predictors: (Constant), Hotel Star , Service, Location, Sleep Quality, Cleanliness, Value, Rooms

Table 3.11b ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4512.050	7	644.579	3280.135	.000 ^a
	Residual	896.871	4564	.197		
	Total	5408.921	4571			

a. Predictors: (Constant), Hotel Star , Service, Location, Sleep Quality, Cleanliness, Value, Rooms

b. Dependent Variable: Overall

Table 3.11c Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.410	.070		-5.871	.000
	Value	.171	.010	.177	17.726	.000
	Location	.019	.012	.012	1.655	.098
	Sleep Quality	.166	.010	.160	17.054	.000
	Rooms	.272	.011	.272	25.572	.000
	Cleanliness	.111	.011	.099	9.999	.000
	Service	.330	.009	.337	35.511	.000
	Hotel Star	.018	.014	.008	1.358	.175

a. Dependent Variable: Overall

The results of the regression analysis of model are presented in Table 3.11a 3.11b 3.11c. The analysis indicates a perfect fit, with a very high $R^2 = 0.834$ and significant likelihood ratio (sig. = .000). The coefficients are positive and significant. The unstandardized coefficient of service is .330, which is obviously the most important factor that positively impacts the overall rating as a proxy of the return intentions. It is followed by rooms (.272), value (.171), sleep quality (.166), cleanliness (.111) and location (.019). Through the analyses results, we might easily rank the importance of the different individual aspect which definitely helps hotels better allocate their resources to provide services to the customers.

3.4.3 Friend group

Table 3.12a Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.895 ^a	.800	.800	.4281

a. Predictors: (Constant), Hotel Star , Location, Sleep Quality, Service, Cleanliness, Value, Rooms

Table 3.12b ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2134.862	7	304.980	1664.121	.000 ^a
	Residual	533.127	2909	.183		
	Total	2667.988	2916			

a. Predictors: (Constant), Hotel Star , Location, Sleep Quality, Service, Cleanliness, Value, Rooms

b. Dependent Variable: Overall

Table 3.12c Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.400	.085		-4.693	.000

Value	.202	.013	.216	15.656	.000
Location	.063	.016	.037	3.939	.000
Sleep Quality	.108	.013	.106	8.334	.000
Rooms	.267	.014	.274	19.336	.000
Cleanliness	.103	.015	.092	6.923	.000
Service	.311	.012	.324	25.373	.000
Hotel Star	.037	.014	.023	2.652	.008

a. Dependent Variable: Overall

The results of the regression analysis of model are presented in Table 3.12a 3.12b 3.12c. The analysis indicates a perfect fit, with a very high $R^2 = 0.800$ and significant likelihood ratio (sig. = .000). The coefficients are positive and significant. The unstandardized coefficient of service is .311, which is obviously the most important factor that positively impacts the overall rating as a proxy of the return intentions. It is followed by rooms (.267), value (.202), sleep quality (.108), cleanliness (.103) and location (.063). Through the analyses results, we might easily rank the importance of the different individual aspect which definitely helps hotels better allocate their resources to provide services to the customers.

3.4.4 Solo group

Table 3.13a Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.879 ^a	.772	.771	.4611

a. Predictors: (Constant), Hotel Star , Service, Location, Sleep Quality, Cleanliness, Value, Rooms

Table 3.13b ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	894.014	7	127.716	600.793	.000 ^a
	Residual	263.599	1240	.213		
	Total	1157.612	1247			

a. Predictors: (Constant), Hotel Star , Service, Location, Sleep Quality, Cleanliness, Value, Rooms

b. Dependent Variable: Overall

Table 3.13c Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	-.609	.143		-4.267	.000
Value	.160	.020	.168	8.099	.000
Location	.120	.026	.070	4.694	.000
Sleep Quality	.149	.019	.151	7.817	.000
Rooms	.256	.022	.259	11.637	.000
Cleanliness	.057	.022	.050	2.612	.009
Service	.356	.019	.373	19.007	.000
Hotel Star	.029	.024	.016	1.179	.239

a. Dependent Variable: Overall

The results of the regression analysis of model are presented in Table 3.13a 3.13b 3.13c. The analysis indicates a perfect fit, with a very high $R^2 = 0.772$ and significant likelihood ratio (sig. = .000). The coefficients are positive and significant. The unstandardized coefficient of service is .356, which is obviously the most important factor that positively impacts the overall rating as a proxy of the return intentions. It is followed by rooms (.256), value (.160), sleep quality (.149), Location (.120) and Cleanliness (.057). Through the analyses results, we might easily rank the importance of the different individual aspect which definitely helps hotels better allocate their resources to provide services to the customers.

3.4.5 Couple group

Table 3.14a Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.886 ^a	.785	.785	.4331

a. Predictors: (Constant), Hotel Star , Location, Service, Sleep Quality, Cleanliness, Value, Rooms

Table 3.14b ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5642.172	7	806.025	4297.014	.000 ^a
	Residual	1545.641	8240	.188		
	Total	7187.814	8247			

a. Predictors: (Constant), Hotel Star , Location, Service, Sleep Quality, Cleanliness, Value, Rooms

b. Dependent Variable: Overall

Table 3.14c Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.329	.056		-5.909	.000
	Value	.204	.008	.215	26.397	.000
	Location	.049	.010	.027	4.770	.000
	Sleep Quality	.122	.008	.122	16.242	.000
	Rooms	.260	.008	.271	31.636	.000
	Cleanliness	.103	.009	.090	11.416	.000
	Service	.316	.008	.324	42.092	.000
	Hotel Star	.020	.009	.011	2.161	.031

a. Dependent Variable: Overall

The results of the regression analysis of model are presented in Table 3.14a 3.14b 3.14c. The analysis indicates a perfect fit, with a very high R² = 0.785 and significant likelihood ratio (sig. = .000). The coefficients are positive and significant. The unstandardized coefficient of service is .316, which is obviously the most important factor that positively impacts the overall rating as a proxy of the return intentions. It is followed by rooms (.260), value (.204), sleep quality (.122), cleanliness (.103) and location (.049). Through the analyses results, we might easily rank the importance of the different individual aspect which definitely helps hotels better allocate their resources to provide services to the customers.

Implication: Here, we can conclude that the six different individual review items account for different weights in the overall rating scale. And we also acquired the rank of the importance.

Service, Rooms and Value ratings are the top 3 important items which account for more than 70% of the overall rating. So this implication will help hotels allocate their resources more flexible and efficient rather than focus on every single aspect. Especially for those small hotels, they may be able to run better business since they learn where to allocate more resources according to the importance since most cases they might have limited resources.

3.5 Correlation Analysis

In most cases, different factors interacted with each other rather than impact overall rating separately. So it is necessary to investigate the interaction relationship among the six individual review aspects and between each review item and overall rating. The later could indicate an important implication for hotel industry since where we may find different factor impact overall rating at different extend. Here I conducted the correlation analysis with the total data set. The analysis result displayed as below.

Table 3.15 Correlations

	Overall	Service	Rooms	Value	Cleanliness	Sleep Quality	Location
Overall	1	.804**	.802**	.781**	.737**	.716**	.462**
	.000	.000	.000	.000	.000	.000	.000
	46541	46322	34932	35053	35081	31236	35140
Service	.804**	1	.666**	.709**	.670**	.608**	.409**
	.000	.000	.000	.000	.000	.000	.000
	46322	46436	34895	35042	35047	31202	35090
Rooms	.802**	.666**	1	.714**	.725**	.695**	.426**
	.000	.000	.000	.000	.000	.000	.000
	34932	34895	35043	29360	29412	25592	29452
Value	.781**	.709**	.714**	1	.653**	.631**	.418**
	.000	.000	.000	.000	.000	.000	.000
	35053	35042	29360	35168	29480	25660	29472
Cleanline ss	.737**	.670**	.725**	.653**	1	.652**	.418**
	.000	.000	.000	.000	.000	.000	.000
	35081	35047	29412	29480	35194	25769	29587
Sleep Quality	.716**	.608**	.695**	.631**	.652**	1	.407**
	.000	.000	.000	.000	.000	.000	.000
	31236	31202	25592	25660	25769	31347	25763

Location	.462**	.409**	.426**	.418**	.418**	.407**	1
	.000	.000	.000	.000	.000	.000	
	35140	35090	29452	29472	29587	25763	35254

** . Correlation is significant at the 0.01 level (2-tailed).

Though the table above, we can conclude that there is a significant positive relationship between six individual review items and overall rating. But the significance of correlation is different; the correlation significance between service and overall rating is .804 and followed by rooms (.802), value (.781), cleanliness (.737), sleep quality (.716) and location (.462).

3.6 Chapter conclusion

Through a series of regression analyses, we can conclude that six individual review item impact overall rating differently, where the three most important factors are Service, Rooms and Value, followed by Cleanliness, Sleep Quality and Location. And this is true for different customer groups except for solo customers. For solo customer group, location (0.12) accounts for more weights than cleanliness (0.57). Therefore, this conclusion is a great implication for the hotel industry and then they are able to prioritize their work target. In this case, service quality is definitely the most important factor to influence the overall rating which is a major indicator of consumers' return intentions. Other factors, such as rooms, value, sleep quality; cleanliness and location are ranked second to sixth.

Implication: For solo customer group, factor location accounts for 0.12 weights, this is more important than cleanliness (0.057). Except for this, the importance of other factors is same in terms of rank within the each customer group, namely, service, rooms, value, sleep quality, cleanliness and location. So this is an important implication for hotel industry which definitely helps hotels provide better performance to cater different customer group.

In the next chapter, I will further conduct a series of analyses to investigate the multiple comparisons to figure out where the rating difference exist between independent hotels and chain hotels, between 2-3 star hotels and 4-5 hotels in terms of the six individual factors. And also, I will figure out the pattern difference between independent hotels and chain hotels and between 2-3 star hotels and 4-5 star hotels.

Chapter 4 Comparison

From this chapter, I will further investigate the online review differences from service, rooms, value, cleanliness, sleep quality and location ratings' perspective, which to a different extent influence the overall rating. I will take the overall rating into consideration as well since these are the most important factors that influence the customers' return intentions. The results of the statistical research are definitely helpful for the hotel industry. The further research is divided into two groups as displayed below.

4.1 Independent Hotels

Table 4.1a Descriptives

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
						Lower Bound	Upper Bound
Value	1	3198	4.227	.9907	.0175	4.193	4.262
	2	1937	3.962	1.1268	.0256	3.912	4.013
	3	1739	4.206	1.0162	.0244	4.159	4.254
	4	656	4.216	.9739	.0380	4.142	4.291
	5	5043	4.262	.9361	.0132	4.236	4.288
	Total	12573	4.197	.9996	.0089	4.179	4.214
Location	1	3143	4.753	.5488	.0098	4.734	4.772
	2	1903	4.648	.6486	.0149	4.619	4.677
	3	1720	4.757	.5341	.0129	4.732	4.782
	4	673	4.773	.5062	.0195	4.734	4.811
	5	5062	4.801	.4803	.0068	4.788	4.814
	Total	12501	4.758	.5373	.0048	4.749	4.767
Sleep Quality	1	3176	4.296	.9842	.0175	4.261	4.330
	2	1905	4.186	1.0624	.0243	4.139	4.234
	3	1711	4.280	.9832	.0238	4.233	4.327

	4	681	4.241	1.0048	.0385	4.165	4.316
	5	5054	4.366	.9279	.0131	4.340	4.391
	Total	12527	4.302	.9773	.0087	4.285	4.319
Rooms	1	3152	4.211	.9978	.0178	4.176	4.246
	2	1903	4.028	1.1162	.0256	3.978	4.078
	3	1675	4.121	1.0288	.0251	4.071	4.170
	4	674	4.196	.9553	.0368	4.124	4.268
	5	5073	4.233	.9570	.0134	4.207	4.260
	Total	12477	4.179	1.0052	.0090	4.162	4.197
Cleanliness	1	3184	4.480	.8450	.0150	4.451	4.510
	2	1893	4.372	.9668	.0222	4.329	4.416
	3	1653	4.438	.8639	.0212	4.396	4.480
	4	696	4.507	.8310	.0315	4.445	4.569
	5	5081	4.553	.7944	.0111	4.532	4.575
	Total	12507	4.490	.8489	.0076	4.475	4.504
Service	1	4289	4.404	.9625	.0147	4.375	4.433
	2	2490	4.241	1.1298	.0226	4.196	4.285
	3	2307	4.339	.9920	.0207	4.299	4.380
	4	916	4.390	.9303	.0307	4.329	4.450
	5	6830	4.477	.9036	.0109	4.455	4.498
	Total	16832	4.400	.9719	.0075	4.385	4.414
Overall	1	4305	4.310	.9499	.0145	4.282	4.339
	2	2506	4.099	1.1372	.0227	4.054	4.144
	3	2324	4.253	.9733	.0202	4.213	4.292
	4	922	4.266	.9319	.0307	4.205	4.326
	5	6855	4.361	.9063	.0109	4.340	4.383
	Total	16912	4.289	.9692	.0075	4.275	4.304

The descriptive statistics regard independent hotels' rating across the five customer groups are reported in Table 4.1a. It showed that the mean and standard deviation of each individual review item and overall review among the five different customer group.

Table 4.1b Test of Homogeneity of Variances

	Levene Statistic	df1	df2	Sig.
Value	13.027	4	12568	.000
Location	84.625	4	12496	.000

Sleep Quality	11.744	4	12522	.000
Rooms	9.215	4	12472	.000
Cleanliness	33.029	4	12502	.000
Service	52.006	4	16827	.000
Overall	36.800	4	16907	.000

As shown in the table 4.1b, the p-value of Test of Homogeneity of Variances is 0.000, which is less than 0.05, meaning that Homogeneity of Variances was rejected.

Table 4.1c ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Value	Between Groups	131.174	4	32.793	33.156	.000
	Within Groups	12430.622	12568	.989		
	Total	12561.795	12572			
Location	Between Groups	32.583	4	8.146	28.461	.000
	Within Groups	3576.426	12496	.286		
	Total	3609.009	12500			
Sleep Quality	Between Groups	49.590	4	12.397	13.030	.000
	Within Groups	11914.178	12522	.951		
	Total	11963.768	12526			
Rooms	Between Groups	67.568	4	16.892	16.803	.000
	Within Groups	12537.720	12472	1.005		
	Total	12605.287	12476			
Cleanliness	Between Groups	51.594	4	12.898	17.998	.000
	Within Groups	8959.795	12502	.717		
	Total	9011.388	12506			
Service	Between Groups	112.127	4	28.032	29.880	.000
	Within Groups	15786.391	16827	.938		
	Total	15898.518	16831			
Overall	Between Groups	131.629	4	32.907	35.318	.000
	Within Groups	15752.879	16907	.932		
	Total	15884.508	16911			

Through the results of ANOVA, it can be clearly seen that there exist significant mean differences among the five different customer groups in terms of six individual rating and overall rating within independent hotels. Hypothesis 2a is supported.

Table 4.1d Robust Tests of Equality of Means

		Statistic ^a	df1	df2	Sig.
Value	Welch	27.478	4	3278.421	.000
	Brown-Forsythe	31.841	4	6768.025	.000
Location	Welch	22.991	4	3294.553	.000
	Brown-Forsythe	26.975	4	6964.655	.000
Sleep Quality	Welch	12.382	4	3326.715	.000
	Brown-Forsythe	12.451	4	6486.814	.000
Rooms	Welch	14.843	4	3309.801	.000
	Brown-Forsythe	16.388	4	6998.524	.000
Cleanliness	Welch	16.526	4	3341.964	.000
	Brown-Forsythe	17.198	4	6843.634	.000
Service	Welch	26.371	4	4456.934	.000
	Brown-Forsythe	28.527	4	9276.882	.000
Overall	Welch	29.158	4	4488.872	.000
	Brown-Forsythe	33.743	4	9256.578	.000

a. Asymptotically F distributed.

Although the p-value of Test of Homogeneity of Variances is 0.000, which is less than 0.05, meaning that Homogeneity of Variances was rejected. Through the Robust Tests of Equality of Means above, we are confident that there exist significant mean differences in six individual rating item and overall rating among the five customer group within independent hotels.

Conclusion:

As mentioned, it can be clearly seen that there exist significant mean differences among the five different customer groups in terms of six individual rating and overall rating within independent hotels. Furthermore, I would like to investigate where the mean differences exist, so I conducted the multiple comparisons among the five customer groups to figure out. (Multiple comparison table1 for independent hotels in Appendix) Here, I decided to fully investigate the overall rating and the other factors which influence the overall rating, namely, service, rooms, value, sleep quality, cleanliness and location.

First, in terms of overall rating, there is no doubt that overall rating is the most important factor which can mostly reflect the customers' return intentions. Through the multiple comparisons table, it can be concluded that there are significant mean differences between business group and the other four groups. Also, there are significant mean differences between family group and couple group. Then, there are significant mean differences between friend group and couple group while there does not exist significant mean differences between friend group and solo group. Last but not the least, there exist significant mean differences between solo group and couple group.

4.2 Chain Hotels

Table 4.2a Descriptives

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
						Lower Bound	Upper Bound
						Value	1
	2	4036	3.692	1.1443	.0180	3.657	3.728
	3	2278	4.076	1.0305	.0216	4.034	4.118
	4	977	3.961	1.0667	.0341	3.894	4.028
	5	6025	4.024	1.0415	.0134	3.998	4.050
	Total	18715	3.952	1.0726	.0078	3.936	3.967
Location	1	5444	4.731	.5713	.0077	4.716	4.746
	2	4062	4.568	.6801	.0107	4.548	4.589
	3	2291	4.705	.5905	.0123	4.681	4.729
	4	998	4.668	.6216	.0197	4.630	4.707
	5	6060	4.713	.5753	.0074	4.699	4.728
	Total	18855	4.684	.6057	.0044	4.675	4.692
Sleep Quality	1	5425	4.314	.9411	.0128	4.289	4.339
	2	4016	4.051	1.0596	.0167	4.018	4.084
	3	2299	4.349	.8964	.0187	4.313	4.386
	4	984	4.201	.9965	.0318	4.139	4.264
	5	5984	4.330	.9389	.0121	4.307	4.354
	Total	18708	4.261	.9714	.0071	4.247	4.275
Rooms	1	5415	4.172	.9735	.0132	4.147	4.198
	2	4062	3.845	1.1093	.0174	3.811	3.880

	3	2262	4.157	.9791	.0206	4.117	4.197
	4	980	4.083	1.0269	.0328	4.018	4.147
	5	5959	4.150	.9852	.0128	4.125	4.175
	Total	18678	4.088	1.0197	.0075	4.073	4.102
Cleanliness	1	5499	4.407	.8675	.0117	4.384	4.430
	2	4077	4.190	.9983	.0156	4.160	4.221
	3	2284	4.433	.8575	.0179	4.397	4.468
	4	978	4.356	.9039	.0289	4.299	4.413
	5	5953	4.423	.8609	.0112	4.402	4.445
	Total	18791	4.366	.9010	.0066	4.353	4.379
Service	1	7497	4.283	1.0277	.0119	4.260	4.307
	2	5410	4.031	1.1572	.0157	4.000	4.062
	3	3192	4.279	1.0287	.0182	4.244	4.315
	4	1328	4.181	1.0861	.0298	4.123	4.240
	5	8291	4.286	1.0152	.0111	4.264	4.308
	Total	25718	4.225	1.0604	.0066	4.213	4.238
Overall	1	7526	4.201	.9759	.0112	4.179	4.223
	2	5437	3.870	1.1107	.0151	3.841	3.900
	3	3206	4.209	.9583	.0169	4.175	4.242
	4	1339	4.085	1.0223	.0279	4.030	4.140
	5	8326	4.195	.9671	.0106	4.174	4.215
	Total	25834	4.124	1.0121	.0063	4.112	4.137

The descriptive statistics regard independent hotels' rating across the five customer groups are reported in Table 4.2a. It showed that the mean and standard deviation of each individual review item and overall review among the five different customer group.

Table 4.2b Test of Homogeneity of Variances

	Levene Statistic	df1	df2	Sig.
Value	48.136	4	18710	.000
Location	102.315	4	18850	.000
Sleep Quality	8.826	4	18703	.000
Rooms	27.886	4	18673	.000
Cleanliness	29.334	4	18786	.000
Service	24.595	4	25713	.000
Overall	35.703	4	25829	.000

As shown in the table 4.2b, the p-value of Test of Homogeneity of Variances is 0.000, which is less than 0.05, meaning that Homogeneity of Variances was rejected.

Table 4.2c ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Value	Between Groups	357.238	4	89.309	78.920	.000
	Within Groups	21173.096	18710	1.132		
	Total	21530.334	18714			
Location	Between Groups	72.786	4	18.197	50.120	.000
	Within Groups	6843.646	18850	.363		
	Total	6916.432	18854			
Sleep Quality	Between Groups	242.774	4	60.693	65.208	.000
	Within Groups	17408.186	18703	.931		
	Total	17650.960	18707			
Rooms	Between Groups	311.551	4	77.888	76.107	.000
	Within Groups	19109.977	18673	1.023		
	Total	19421.528	18677			
Cleanliness	Between Groups	164.937	4	41.234	51.342	.000
	Within Groups	15087.656	18786	.803		
	Total	15252.593	18790			
Service	Between Groups	272.659	4	68.165	61.184	.000
	Within Groups	28646.758	25713	1.114		
	Total	28919.418	25717			
Overall	Between Groups	461.450	4	115.363	114.601	.000
	Within Groups	26000.697	25829	1.007		
	Total	26462.147	25833			

Through the results of ANOVA, it can be clearly seen that there exist significant mean differences among the five different customer groups in terms of six individual rating and overall rating within independent hotels. Hypothesis 2b is NOT supported.

Table 4.2d Robust Tests of Equality of Means

		Statistic ^a	df1	df2	Sig.
Value	Welch	71.309	4	5051.483	.000
	Brown-Forsythe	78.658	4	10140.374	.000
Location	Welch	42.595	4	5093.687	.000

	Brown-Forsythe	48.789	4	9850.740	.000
Sleep Quality	Welch	57.698	4	5078.078	.000
	Brown-Forsythe	64.642	4	9773.546	.000
Rooms	Welch	66.827	4	5043.750	.000
	Brown-Forsythe	75.284	4	9963.607	.000
Cleanliness	Welch	44.124	4	5055.382	.000
	Brown-Forsythe	50.916	4	10083.768	.000
Service	Welch	53.828	4	6879.525	.000
	Brown-Forsythe	59.930	4	13332.991	.000
Overall	Welch	99.243	4	6941.984	.000
	Brown-Forsythe	113.154	4	13642.514	.000

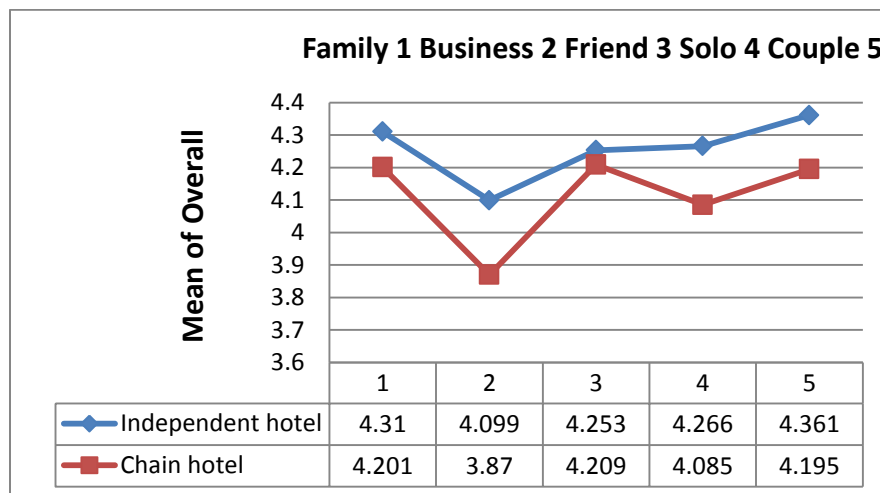
a. Asymptotically F distributed.

Although the p-value of Test of Homogeneity of Variances is 0.000, which is less than 0.05, meaning that Homogeneity of Variances was rejected. Through the Robust Tests of Equality of Means above, we are confident that there exist significant mean differences in six individual rating item and overall rating among the five customer group.

4.3 Independent hotels VS Chain hotels

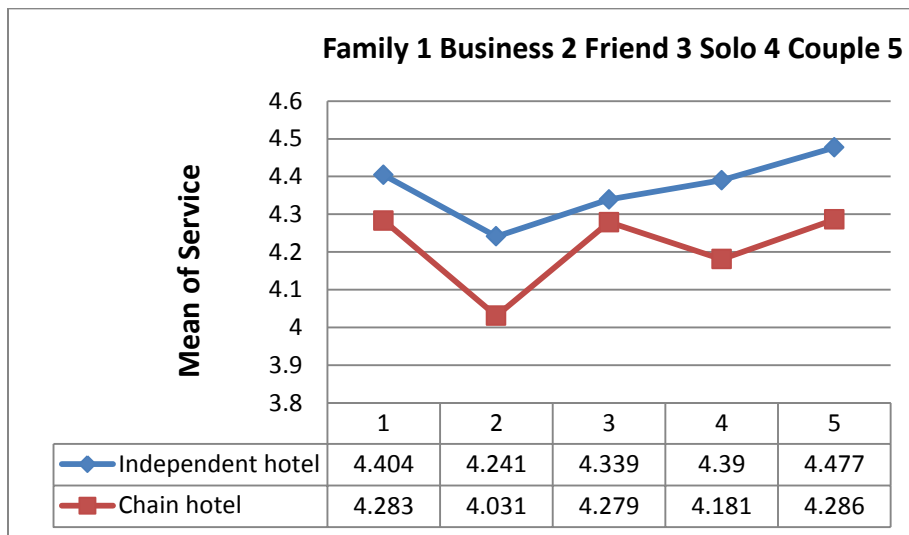
In this part, I will compare the pattern difference of review rating given by each customer group. First, I will figure out the overall rating and followed by service, rooms, value, sleep quality, cleanliness and location.

Figure 4.1 Mean of Overall



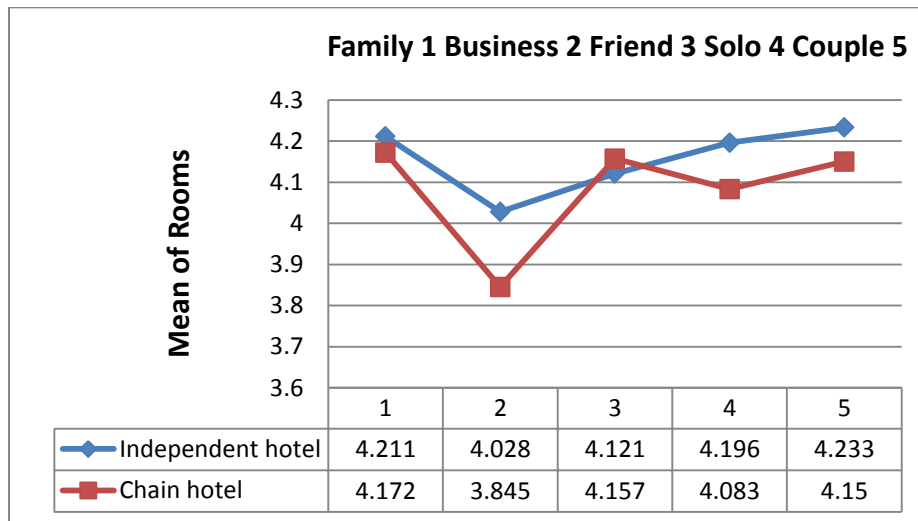
As shown in Figure 4.1, in terms of overall rating, independent hotels possess higher ratings than chain hotels from the entire five customer group. The pattern and trend are similar between independent hotels and chain hotels except for the friend customer group where friend customer group’s rating is higher than that of solo customer group. Specifically, friend customer group’s rating is lower than that of solo and couple customer groups in the independent hotels while Friend customer group’s rating is higher than that of solo and couple customer groups in chain hotels.

Figure 4.2 Mean of Service



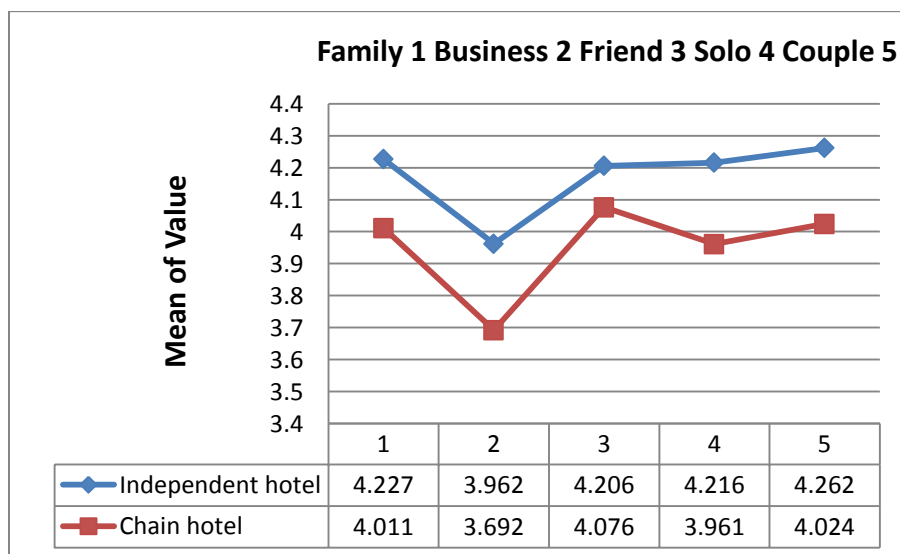
In Figure 4.2, similar with the pattern in Figure 4.1, independent hotels have got higher ratings than chain hotels in terms of service rating from the entire five customer group. Here, also, the pattern and trend are similar between independent hotels and chain hotels except for the friend customer group where friend customer group’s rating is higher than that of solo customer group.

Figure 4.3 Mean of Rooms



In Figure 4.3, the pattern difference between independent and chain hotels is obvious. Friend customer group's rating is lower than that of solo and couple customer groups in the independent hotels while Friend customer group's rating is higher than that of solo and couple customer groups in chain hotels.

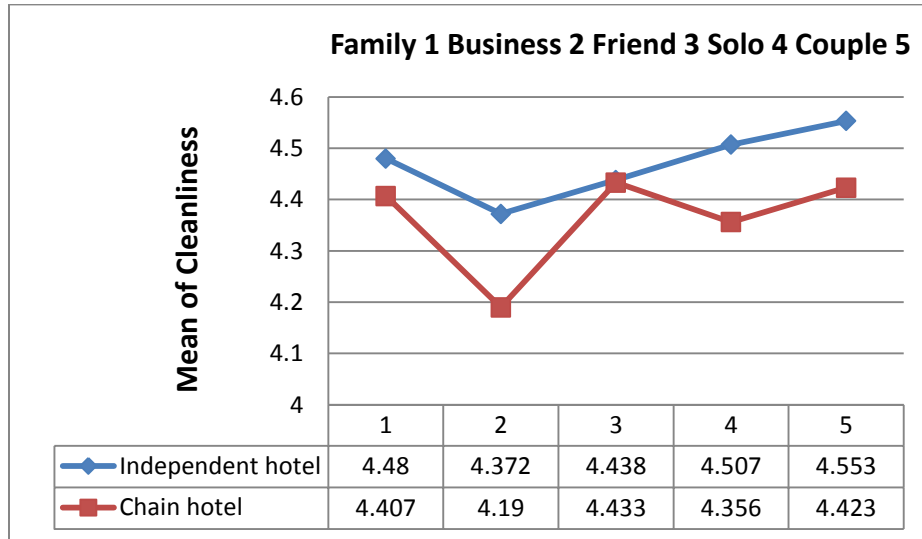
Figure 4.4 Mean of Value



As displayed in Figure 4.4, the pattern difference between independent and chain hotels is explained as friend customer group's rating is lower than that of solo and couple customer groups in the independent hotels while Friend customer group's rating is higher than that of solo

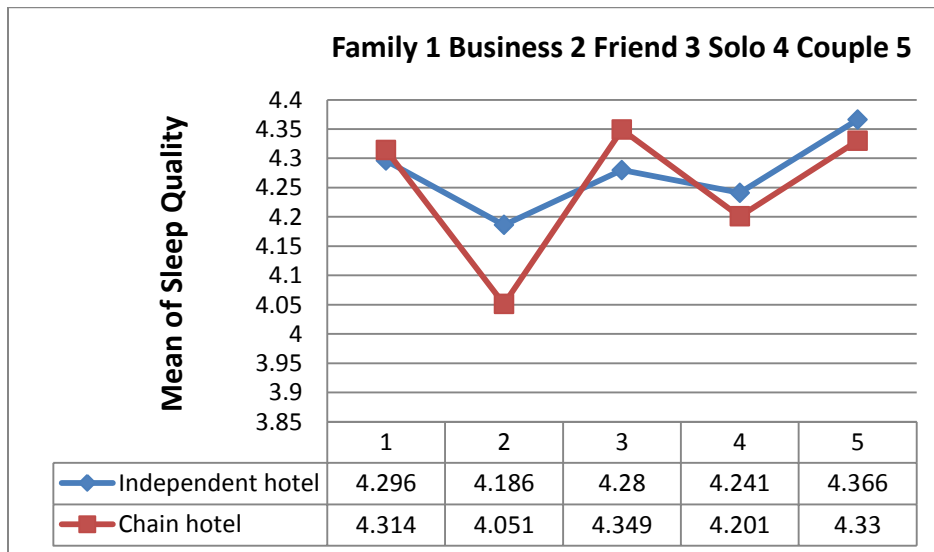
and couple customer groups in chain hotels. So the pattern difference is same between rooms' rating and value rating.

Figure 4.5 Mean of Cleanliness



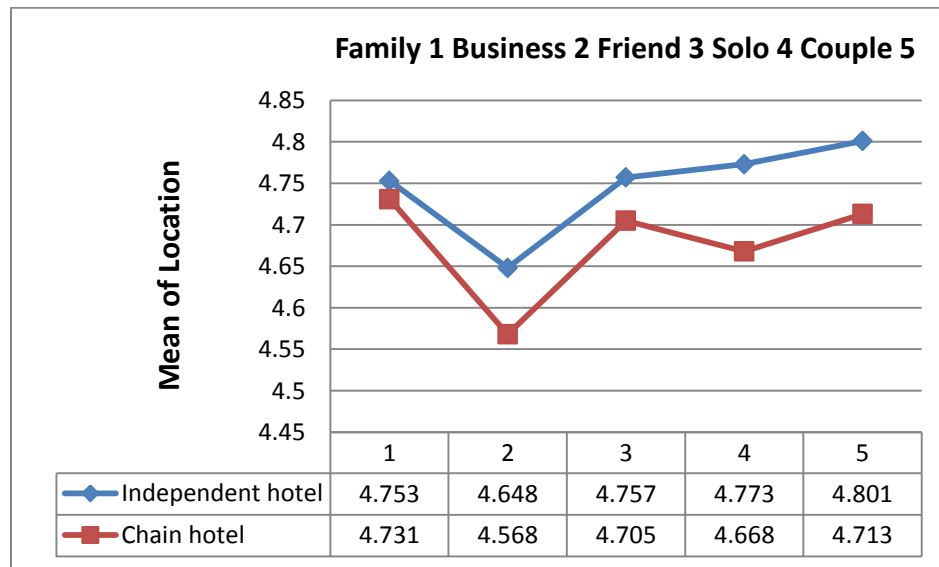
In Figure 4.5, the pattern difference between independent and chain hotels is also obvious. Friend customer group's rating is lower than that of solo and couple customer groups in the independent hotels while Friend customer group's rating is higher than that of solo and couple customer groups in chain hotels.

Figure 4.6 Mean of Sleep Quality



As displayed in Figure 4.6, in terms of rating of sleep quality, family and friend customer groups' rating in independent hotels are lower than that in chain hotels whereas business, solo and couple 's rating are higher than that in chain hotels. But there is no big difference in terms of pattern between independent and chain hotels.

Figure 4.7 Mean of Location



In Figure 4.7, the pattern difference between independent and chain hotels is that solo customer group's rating is lower than that of friend customer group in the independent hotels while solo customer group's rating is higher than that of friend customer group in chain hotels.

Conclusion: In terms of overall rating, service rating, rooms rating, value rating and cleanliness rating, the pattern different point is friend customer group where it has lower rating than solo and couple customer group within independent hotels but it has higher rating than solo and couple customer group in the chain hotels.

In terms of overall rating, the mean ratings of the independent hotels are higher than the ratings of the chain hotels among all five customer groups. For service rating, the mean ratings of the independent hotels are also higher than the ratings of the chain hotels. For rooms rating, the mean ratings of the independent hotels are also higher than the ratings of the chain hotels except for the friend group. For value rating, the mean ratings of the independent hotels are higher than the ratings of the chain hotels. For cleanliness rating, the mean ratings of the independent hotels are higher than the ratings of the chain hotels. For sleep quality rating, the mean ratings of the

independent hotels are also higher than the ratings of the chain hotels except for the family and friend groups. For location rating, the mean ratings of the independent hotels are higher than the ratings of the chain hotels.

Conclusion: Hypothesis 2a is supported. Hypothesis 2b is NOT supported. Hypothesis 4 is NOT supported. Generally speaking, Independent hotels are making better performance than chain hotels rather than chain hotels are performing better than independent hotels except for some certain customer group in terms of rooms rating and sleep quality. This is a surprise for the public since most people may think chain hotels provide better service and acquired higher reviews because of this.

Implications: Compared with independent hotels, chain hotels usually operate their business in a larger area. Generally, chain hotels have consistent management requirements and standards among branches. But actually, from the results of the research, independent hotels make better performance than chain hotels which is definitely an alert for chain hotels. Customers' ratings reflect their general service level. For chain hotels, they should improve their service to cater for different customer group. Otherwise, they might lose in the completion with independent hotels.

4.4 Star 2-3 Hotels

Table 4.3a Descriptives

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
						Lower Bound	Upper Bound
Value	1	2580	4.205	.9695	.0191	4.167	4.242
	2	1247	4.006	1.1077	.0314	3.944	4.067
	3	1401	4.231	.9714	.0260	4.180	4.282
	4	539	4.174	.9382	.0404	4.095	4.254
	5	2735	4.223	.9562	.0183	4.187	4.259
	Total	8502	4.184	.9878	.0107	4.163	4.205
Location	1	2523	4.704	.6027	.0120	4.680	4.727
	2	1206	4.590	.6630	.0191	4.553	4.628
	3	1395	4.739	.5390	.0144	4.711	4.767

	4	537	4.693	.5768	.0249	4.644	4.742
	5	2732	4.750	.5267	.0101	4.731	4.770
	Total	8393	4.708	.5787	.0063	4.695	4.720
Sleep Quality	1	2595	4.218	.9795	.0192	4.180	4.256
	2	1225	4.078	1.0785	.0308	4.017	4.138
	3	1405	4.268	.9103	.0243	4.220	4.315
	4	551	4.180	.9993	.0426	4.096	4.263
	5	2714	4.238	.9780	.0188	4.202	4.275
	Total	8490	4.210	.9857	.0107	4.189	4.231
Rooms	1	2555	4.083	.9777	.0193	4.045	4.121
	2	1206	3.896	1.0522	.0303	3.837	3.956
	3	1360	4.055	.9799	.0266	4.003	4.107
	4	542	4.059	.9557	.0411	3.978	4.140
	5	2687	4.057	.9698	.0187	4.020	4.094
	Total	8350	4.041	.9869	.0108	4.020	4.063
Cleanliness	1	2607	4.401	.8490	.0166	4.369	4.434
	2	1225	4.269	.9620	.0275	4.215	4.322
	3	1364	4.395	.8488	.0230	4.350	4.440
	4	551	4.405	.8407	.0358	4.334	4.475
	5	2662	4.383	.8949	.0173	4.349	4.417
	Total	8409	4.375	.8813	.0096	4.357	4.394
Service	1	3579	4.319	.9658	.0161	4.287	4.351
	2	1601	4.181	1.0900	.0272	4.127	4.234
	3	1928	4.284	.9639	.0220	4.241	4.327
	4	726	4.229	.9980	.0370	4.156	4.301
	5	3729	4.300	.9576	.0157	4.269	4.330
	Total	11563	4.282	.9839	.0092	4.264	4.300
Overall	1	3588	4.181	.9506	.0159	4.150	4.212
	2	1608	3.980	1.0820	.0270	3.927	4.033
	3	1940	4.180	.9233	.0210	4.139	4.222
	4	732	4.122	.9255	.0342	4.054	4.189
	5	3751	4.174	.9271	.0151	4.144	4.204
	Total	11619	4.147	.9588	.0089	4.130	4.165

The descriptive statistics regard 2-3 star hotels' rating across the five customer groups are reported in Table 4.3a. It showed that the mean and standard deviation of each individual review item and overall review among the five different customer group.

Table 4.3b Test of Homogeneity of Variances

	Levene Statistic	df1	df2	Sig.
Value	4.015	4	8497	.003
Location	41.951	4	8388	.000
Sleep Quality	3.537	4	8485	.007
Rooms	5.187	4	8345	.000
Cleanliness	5.600	4	8404	.000
Service	7.340	4	11558	.000
Overall	4.892	4	11614	.001

As shown in the table 4.3b, the p-value of Test of Homogeneity of Variances is 0.000, which is less than 0.05, meaning that Homogeneity of Variances was rejected.

Table 4.3c ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Value	Between Groups	48.128	4	12.032	12.396	.000
	Within Groups	8247.531	8497	.971		
	Total	8295.659	8501			
Location	Between Groups	23.109	4	5.777	17.388	.000
	Within Groups	2786.959	8388	.332		
	Total	2810.068	8392			
Sleep Quality	Between Groups	29.019	4	7.255	7.489	.000
	Within Groups	8219.530	8485	.969		
	Total	8248.549	8489			
Rooms	Between Groups	30.781	4	7.695	7.927	.000
	Within Groups	8100.882	8345	.971		
	Total	8131.663	8349			
Cleanliness	Between Groups	16.886	4	4.222	5.447	.000
	Within Groups	6512.878	8404	.775		
	Total	6529.764	8408			
Service	Between Groups	24.635	4	6.159	6.373	.000
	Within Groups	11169.133	11558	.966		

	Total	11193.768	11562			
Overall	Between Groups	54.301	4	13.575	14.839	.000
	Within Groups	10625.327	11614	.915		
	Total	10679.629	11618			

Through the results of ANOVA, it can be clearly seen that there exist significant mean differences among the five different customer groups in terms of six individual rating and overall rating within independent hotels. Hypothesis 3a is supported.

Table 4.3d Robust Tests of Equality of Means

		Statistic ^a	df1	df2	Sig.
Value	Welch	10.262	4	2598.455	.000
	Brown-Forsythe	12.232	4	5349.293	.000
Location	Welch	14.843	4	2552.155	.000
	Brown-Forsythe	16.853	4	4961.673	.000
Sleep Quality	Welch	6.710	4	2620.052	.000
	Brown-Forsythe	7.370	4	5062.442	.000
Rooms	Welch	7.123	4	2577.560	.000
	Brown-Forsythe	7.880	4	5276.491	.000
Cleanliness	Welch	4.746	4	2618.580	.001
	Brown-Forsythe	5.448	4	5400.776	.000
Service	Welch	5.582	4	3457.277	.000
	Brown-Forsythe	6.164	4	6691.123	.000
Overall	Welch	12.153	4	3498.834	.000
	Brown-Forsythe	14.565	4	7042.380	.000

a. Asymptotically F distributed.

Although the p-value of Test of Homogeneity of Variances is 0.000, which is less than 0.05, meaning that Homogeneity of Variances was rejected. Through the Robust Tests of Equality of Means above, we are confident that there exist significant mean differences in six individual rating item and overall rating among the five customer group.

4.5 Star 4-5 Hotels

Table 4.4a Descriptives

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
						Lower Bound	Upper Bound
Value	1	6017	4.043	1.0464	.0135	4.016	4.069
	2	4726	3.720	1.1481	.0167	3.688	3.753
	3	2616	4.080	1.0508	.0205	4.039	4.120
	4	1094	4.009	1.0796	.0326	3.945	4.073
	5	8333	4.102	1.0147	.0111	4.081	4.124
	Total	22786	4.000	1.0690	.0071	3.986	4.014
Location	1	6064	4.754	.5453	.0070	4.740	4.768
	2	4759	4.595	.6733	.0098	4.576	4.614
	3	2616	4.721	.5822	.0114	4.699	4.743
	4	1134	4.719	.5816	.0173	4.685	4.753
	5	8390	4.754	.5388	.0059	4.743	4.766
	Total	22963	4.715	.5812	.0038	4.708	4.723
Sleep Quality	1	6006	4.345	.9450	.0122	4.322	4.369
	2	4696	4.099	1.0581	.0154	4.069	4.129
	3	2605	4.348	.9469	.0186	4.311	4.384
	4	1114	4.236	1.0000	.0300	4.177	4.295
	5	8324	4.382	.9165	.0100	4.362	4.402
	Total	22745	4.303	.9683	.0064	4.290	4.315
Rooms	1	6012	4.231	.9815	.0127	4.206	4.256
	2	4759	3.905	1.1300	.0164	3.873	3.938
	3	2577	4.187	1.0085	.0199	4.148	4.226
	4	1112	4.163	1.0190	.0306	4.103	4.223
	5	8345	4.231	.9705	.0106	4.210	4.252
	Total	22805	4.155	1.0233	.0068	4.141	4.168
Cleanliness	1	6076	4.448	.8643	.0111	4.426	4.470
	2	4745	4.243	.9996	.0145	4.214	4.271
	3	2573	4.456	.8654	.0171	4.422	4.489
	4	1123	4.426	.8949	.0267	4.373	4.478
	5	8372	4.515	.8104	.0089	4.498	4.533
	Total	22889	4.430	.8826	.0058	4.418	4.441

Service	1	8207	4.331	1.0232	.0113	4.309	4.353
	2	6299	4.076	1.1673	.0147	4.047	4.105
	3	3571	4.316	1.0397	.0174	4.281	4.350
	4	1518	4.285	1.0451	.0268	4.232	4.337
	5	11392	4.396	.9742	.0091	4.378	4.414
	Total	30987	4.299	1.0464	.0059	4.287	4.311
Overall	1	8243	4.267	.9742	.0107	4.246	4.288
	2	6335	3.933	1.1344	.0143	3.905	3.961
	3	3590	4.252	.9857	.0165	4.220	4.285
	4	1529	4.177	1.0195	.0261	4.125	4.228
	5	11430	4.301	.9471	.0089	4.284	4.319
	Total	31127	4.205	1.0126	.0057	4.194	4.217

The descriptive statistics regard 4-5 star hotels' rating across the five customer groups are reported in Table 4.4a. It showed that the mean and standard deviation of each individual review item and overall review among the five different customer groups.

Table 4.4b Test of Homogeneity of Variances

	Levene Statistic	df1	df2	Sig.
Value	52.632	4	22781	.000
Location	159.833	4	22958	.000
Sleep Quality	19.656	4	22740	.000
Rooms	31.312	4	22800	.000
Cleanliness	77.556	4	22884	.000
Service	71.679	4	30982	.000
Overall	51.405	4	31122	.000

As shown in the table 4.4b, the p-value of Test of Homogeneity of Variances is 0.000, which is less than 0.05, meaning that Homogeneity of Variances was rejected.

Table 4.4c ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Value	Between Groups	485.013	4	121.253	108.091	.000
	Within Groups	25554.984	22781	1.122		
	Total	26039.997	22785			
Location	Between Groups	91.056	4	22.764	68.179	.000
	Within Groups	7665.298	22958	.334		
	Total	7756.354	22962			
Sleep Quality	Between Groups	268.682	4	67.171	72.539	.000
	Within Groups	21056.990	22740	.926		
	Total	21325.673	22744			
Rooms	Between Groups	381.648	4	95.412	92.578	.000
	Within Groups	23497.870	22800	1.031		
	Total	23879.517	22804			
Cleanliness	Between Groups	230.720	4	57.680	74.994	.000
	Within Groups	17600.635	22884	.769		
	Total	17831.355	22888			
Service	Between Groups	431.149	4	107.787	99.688	.000
	Within Groups	33499.247	30982	1.081		
	Total	33930.397	30986			
Overall	Between Groups	615.863	4	153.966	153.091	.000
	Within Groups	31299.882	31122	1.006		
	Total	31915.745	31126			

Through the results of ANOVA, it can be clearly seen that there exist significant mean differences among the five different customer groups in terms of six individual rating and overall rating within independent hotels. Hypothesis 3b is NOT supported.

Table 4.4d Robust Tests of Equality of Means

		Statistic ^a	df1	df2	Sig.
Value	Welch	96.825	4	5677.907	.000
	Brown-Forsythe	105.654	4	11198.345	.000
Location	Welch	55.024	4	5785.850	.000
	Brown-Forsythe	65.773	4	11625.833	.000
Sleep Quality	Welch	64.151	4	5720.977	.000
	Brown-Forsythe	70.281	4	11000.075	.000

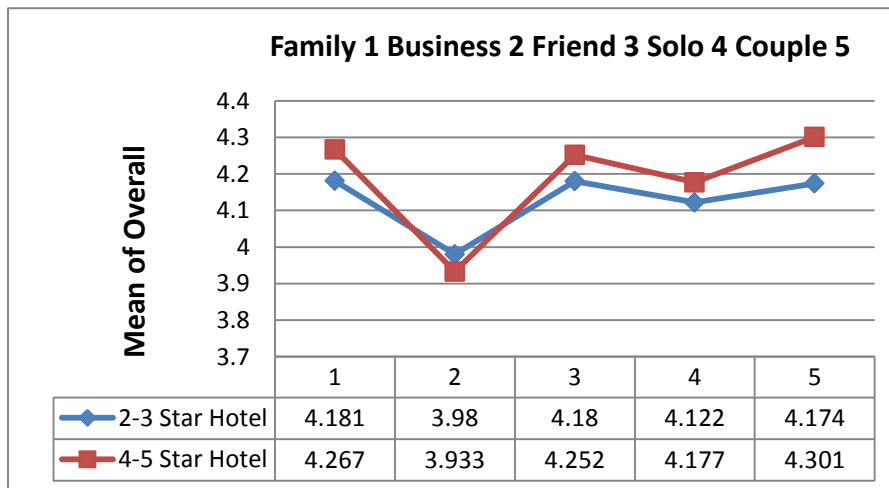
Rooms	Welch	79.341	4	5721.084	.000
	Brown-Forsythe	90.724	4	11529.004	.000
Cleanliness	Welch	64.458	4	5729.637	.000
	Brown-Forsythe	72.471	4	11372.271	.000
Service	Welch	86.705	4	7796.856	.000
	Brown-Forsythe	96.875	4	15738.956	.000
Overall	Welch	128.830	4	7850.471	.000
	Brown-Forsythe	148.822	4	15591.635	.000

a. Asymptotically F distributed.

Although the p-value of Test of Homogeneity of Variances is 0.000, which is less than 0.05, meaning that Homogeneity of Variances was rejected. Through the Robust Tests of Equality of Means above, we are confident that there exist significant mean differences in six individual rating item and overall rating among the five customer group.

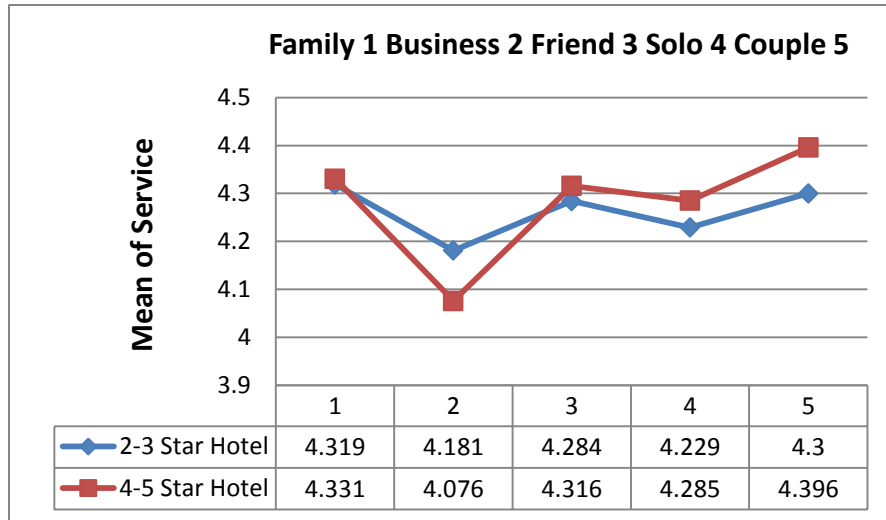
4.6 2-3star hotel VS 4-5 star hotel

Figure 4.8 Mean of Overall



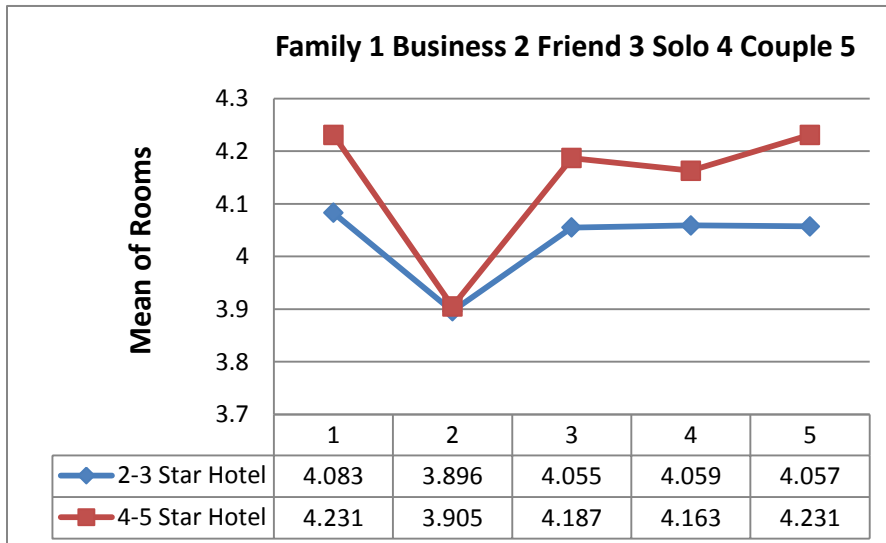
As shown in Figure 4.8, in terms of overall rating, 4-5 star hotels possess higher ratings than 2-3 star hotels from family, friend, solo and couple customer group except for business group. The pattern and trend are similar between independent hotels and chain hotels. Surprisingly, the overall rating given by business customer group within 4-5 star hotels is lower than that within 2-3 star hotels.

Figure 4.9 Mean of Service



As displayed in Figure 4.9, 4-5 star hotels possess higher ratings than 2-3 star hotels from family, friend, solo and couple customer group except for business group in terms of service rating. The pattern is similar between independent hotels and chain hotels. The service rating given by business customer group within 4-5 star hotels is lower than that within 2-3 star hotels, which is definitely a surprise for public.

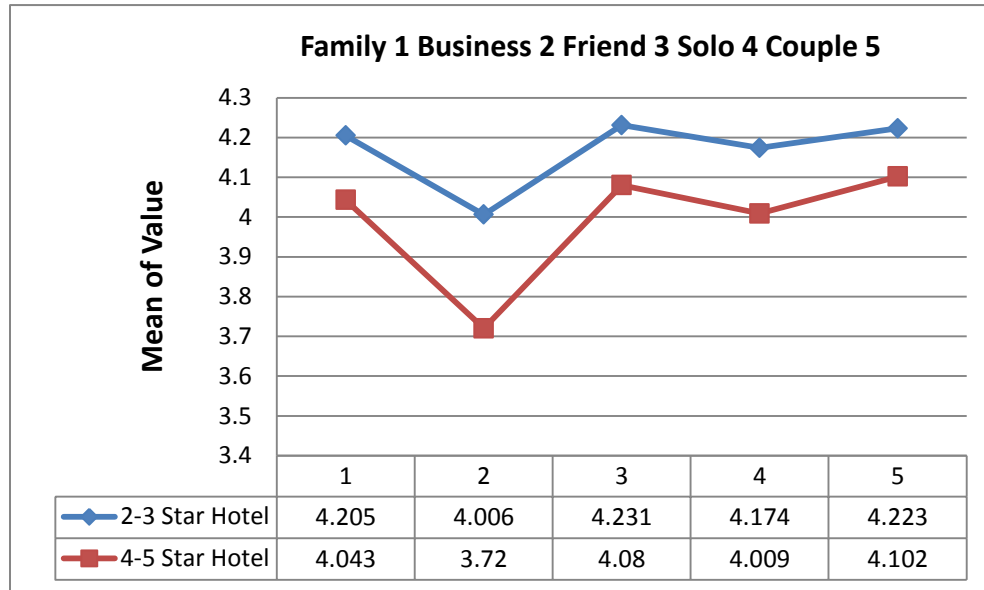
Figure 4.10 Mean of Rooms



In Figure 4.10, 4-5 star hotels acquired higher ratings than 2-3 star hotels from the entire five customer group. In terms of pattern difference, within 2-3 star hotels, rooms' ratings are almost

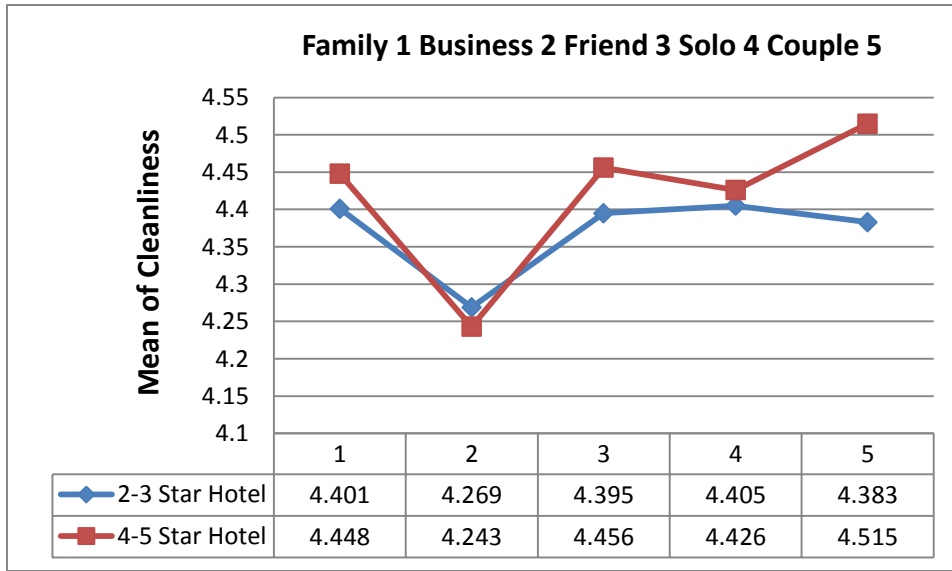
same among friend, solo and couple customer groups while couple's rating is higher than friend and solo customer groups within 4-5 star hotels.

Figure 4.11 Mean of Value



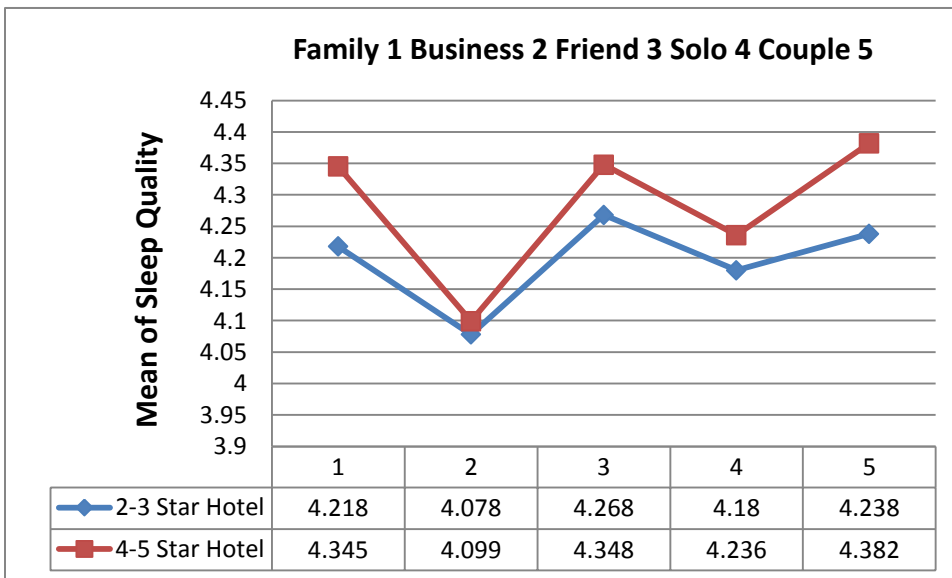
As displayed in Figure 4.11, we can clearly see that the value rating of 2-3 star hotels is consistently higher than that of 4-5 star hotels which implicated that all the customer groups thought that it was not worth to pay high price to go the 4-5 star hotels or the customers' experience was not worth. Then, there is no pattern difference among the entire five customer groups.

Figure 4.12 Mean of Cleanliness



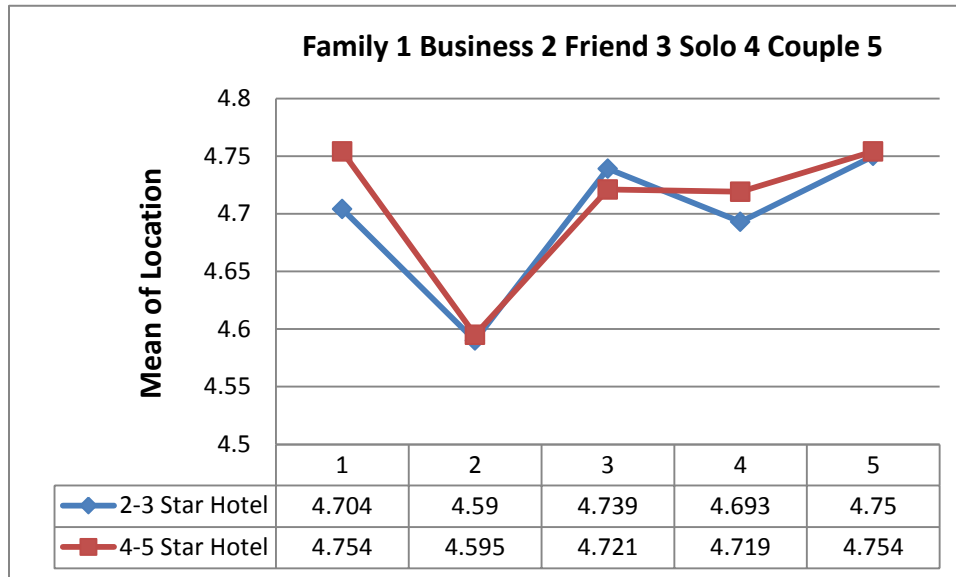
As displayed in Figure 4.12, 4-5 star hotels possess higher ratings than 2-3 star hotels from family, friend, solo and couple customer group except for business group in terms of cleanliness rating. The pattern difference exists where couple customer group 's rating is the highest within 4-5 star hotels while couple customer group's rating is lower that than the friend and solo customer group within 2-3 star hotels.

Figure 4.13 Mean of Sleep Quality



As displayed in Figure 4.13, we can clearly see that the rating of sleep quality in 2-3 star hotels is consistently lower than that of 4-5 star hotels which implicated that the entire customer groups' sleep quality experience are better in 4-5 star hotels than that in 2-3 star hotels. Then, there is no pattern difference among the entire five customer groups.

Figure 4.14 Mean of Location



In Figure 4.14, 4-5 star hotels possess higher ratings than 2-3 star hotels from family, business, solo and couple customer group except for friend group in terms of location rating.

Through the comparison of the pattern difference above, it is clearly seen that there exist pattern difference in all the individual and overall rating aspect. Specifically, in terms of overall rating, the average ratings of the 4-5 star ratings are higher than the ratings of the 2-3 star hotels except for the business group. For service rating, the average ratings of the 4-5 star ratings are also higher than the ratings of the 2-3 star hotels except for the business group. For rooms rating, the average ratings of the 4-5 star ratings are also higher than the ratings of the 2-3 star hotels. For value rating, the average ratings of the 4-5 star ratings are lower than the ratings of the 2-3 star hotels. For cleanliness rating, the average ratings of the 4-5 star ratings are also higher than the ratings of the 2-3 star hotels except for the business group. For sleep quality, the average ratings

of the 4-5 star ratings are also higher than the ratings of the 2-3 star hotels. For location rating, the average ratings of the 4-5 star ratings are also higher than the ratings of the 2-3 star hotels except for the friend group.

Conclusion: Hypothesis 3a is supported and Hypothesis 3b is NOT supported. Hypothesis 5 is NOT supported. Actually, the overall, service and cleanliness's rating given by business customer group for 4-5 star hotels are lower than that for 2-3 rating, which could be a surprise for hotel industry as well. Also, among the five different customer groups, the ratings of individual and overall given by business customer group are the lowest compared with the other groups.

Implications: Business customer group's rating in 2-3 star hotels is higher than that in 4-5 star hotels in terms of overall, service and cleanliness ratings. People might generally think that 4-5 star hotels offer better service than 2-3 star hotels, but actually, it is not the case for business customer group. So, for 4-5 star hotels, they should continuously improve their service because of the higher hotel rates, otherwise, they may lose market share from business customer group.

4.7 Chapter Conclusion

As mentioned, Hypothesis 2a is supported. Hypothesis 2b is NOT supported. Hypothesis 4 is NOT supported. Independent hotels are making better performance than chain hotels rather than chain hotels are performing better than independent hotels except for some certain customer group in terms of rooms rating and sleep quality. This is a surprise for the public since most people may think chain hotels provide better service and acquired higher reviews because of this.

Hypothesis 3a is supported and Hypothesis 3b is NOT supported. Hypothesis 5 is NOT supported. Actually, the overall, service and cleanliness's rating given by business customer group for 4-5 star hotels are lower than that for 2-3 rating, which could be a surprise for hotel industry as well. Also, among the five different customer groups, the ratings of individual and overall given by business customer group are the lowest compared with the other groups.

Chapter 5 Conclusions and Future Work

5.1 Conclusions

Through a series of ANOVA analyses, we can conclude that there exist significant mean differences in terms of six individual ratings and overall rating among different customer groups (Family, Business, Friend, Solo, and Couple). Few researchers have done some research to figure out the review difference between business and leisure tourism purpose group. But in my thesis, I did a comprehensive statistical research from the different customer group perspective. This is the very first time for researchers to analyze that is there any taste difference among different customer groups. Actually, this is a critical issue for hotel industry since they might provide better services to better cater to the different customer groups once they learned what are the taste difference and preference among them. Finally, we found that there exist significant mean differences in terms of six individual ratings and overall rating among different customer groups. This is a great and valuable implication to the whole hotel industry.

Now, we know there are significant mean differences in terms of online review. What about the weight for each individual rating item? Are they equally important? Through the regression analyses, we can conclude that the six different individual review items account for different weights in the overall rating scale. And we also acquired the rank of the importance. Service, Rooms and Value ratings are the top 3 important items which account for more than 70% of the overall rating. So this implication will help hotels allocate their resources more flexible and efficient rather than focus on every single aspect.

In the next section, I conducted the correlation analysis to find out what is the interrelationship among the individual rating items. We found out that there is a significant positive relationship

between six individual review items and overall rating. But the significance of correlation is different; the correlation significance between service and overall rating is .804 and followed by rooms (.802), value (.781), cleanliness (.737), sleep quality (.716) and location (.462). It is clear that the six individual review items and overall rating are mutually interacted. But the correlation significance is different; in this case, hotel industry can better prioritize their tasks according to the analysis result. We cannot deny that it is hard to take care of all aspects and improve all the six individual review items at the same time. So this implication is a great one to the hotel industry.

Last but not the least, I compared the pattern differences between independent and chain hotels and between 2-3 star and 4-5 star hotels. We conclude by Hypothesis 2a is supported. Hypothesis 2b is NOT supported. Hypothesis 4 is NOT supported. Generally speaking, Independent hotels are making better performance than chain hotels rather than chain hotels are performing better than independent hotels except for some certain customer group in terms of rooms rating and sleep quality. This is a super surprise for the public since most people may think chain hotels provide better service and acquired higher reviews because of this. Compared with independent hotels, chain hotels usually operate their business in a larger area. Generally, chain hotels have consistent management requirements and standards among branches. But actually, from the results of the research, independent hotels make better performance than chain hotels which is definitely an alert for chain hotels. Customers' ratings reflect their general service level. For chain hotels, they should improve their service to cater for different customer group. Otherwise, they might lose in the completion with independent hotels. For the comparison between 2-3 star hotels and 4-5 star hotels, we found out Hypothesis 3a is supported and Hypothesis 3b is NOT supported. Hypothesis 5 is NOT supported. Actually, the overall, service and cleanliness's rating given by business customer group for 4-5 star hotels are lower than that for 2-3 rating, which could be a surprise for hotel industry as well. Also, among the five different customer groups, the ratings of individual and overall given by business customer group are the lowest compared with the other groups. Business customer group's rating in 2-3 star hotels is higher than that in 4-5 star hotels in terms of overall, service and cleanliness ratings. People might generally think that 4-5 star hotels offer better service than 2-3 star hotels, but actually, it is not the case for business customer group. So, for 4-5 star hotels, they should continuously improve their service because of the higher hotel rates, otherwise, they may lose market share from business customer group.

The research was targeting on the small and medium sized hotels in the competitive market of hospitality industry. As most cases, they have limited resources. Consequently, a tough operating situation is always a problem for them. Fortunately, they now might be able to improve their business performance through learning how to allocate limited resources more efficiently rather than focus on every single aspect according to the rank importance of the six individual rating items. Besides, the pattern comparison results are helpful to the operation of hotels. They clearly acknowledge their own disadvantages against their competitors. Therefore, the direction of improving the business performance is achievable and realistic as long as the resources allocated on the right way.

5.2 Future work

In terms of the future work, we can further do some research on the following directions:

First, we might try to employ non parametric test non paramedic test (Kruskal–Wallis one-way analysis of variance) to replace the ANOVA to conduct the statistical analyses. Since it is a non-parametric method, the Kruskal–Wallis test does not assume a normal distribution of the residuals, unlike the analogous one-way analysis of variance. But the test does not identify where the difference exist. Because it is not available to do the post-hoc test in the Kruskal–Wallis test. Actually, ANOVA is a robust test and very popular in the academia, in my thesis, I decided to use the ANOVA instead of the Kruskal–Wallis test.

Second, it is the integrity of the data sources. In the thesis, totally, we have 46663 reviews. But some of them are missing one or several individual review item. In terms of complete review which means one review contains of all six individual items and one overall review, 23423 reviews are complete, accounts for 50.2%.

Third, the reliability of the data sets is another issue. We know that TripAdvisor is an open platform where allows everyone to post online reviews even if someone is not a real customer. In this case, the reliability of the data that we collected is highly questionable. How to filter the data sets? This is could be interesting topic for the future studies, which is out of scope in my thesis.

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Appendices

Multiple Comparisons 1

Games-Howell

Dependent Variable	1,2,3,4,5	1,2,3,4,5	Mean Difference (I- J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Value	1	2	.2650*	.0310	.000	.180	.350
		3	.0209	.0300	.957	-.061	.103
		4	.0109	.0419	.999	-.104	.125
		5	-.0344	.0219	.517	-.094	.025
	2	1	-.2650*	.0310	.000	-.350	-.180
		3	-.2441*	.0353	.000	-.341	-.148
		4	-.2542*	.0458	.000	-.379	-.129
		5	-.2994*	.0288	.000	-.378	-.221
	3	1	-.0209	.0300	.957	-.103	.061
		2	.2441*	.0353	.000	.148	.341
		4	-.0100	.0452	.999	-.133	.113
		5	-.0553	.0277	.268	-.131	.020
	4	1	-.0109	.0419	.999	-.125	.104
		2	.2542*	.0458	.000	.129	.379
		3	.0100	.0452	.999	-.113	.133
		5	-.0453	.0402	.793	-.155	.065
	5	1	.0344	.0219	.517	-.025	.094
		2	.2994*	.0288	.000	.221	.378
		3	.0553	.0277	.268	-.020	.131
		4	.0453	.0402	.793	-.065	.155
Location	1	2	.1052*	.0178	.000	.057	.154
		3	-.0039	.0162	.999	-.048	.040
		4	-.0196	.0218	.898	-.079	.040
		5	-.0478*	.0119	.001	-.080	-.015
	2	1	-.1052*	.0178	.000	-.154	-.057
		3	-.1091*	.0197	.000	-.163	-.055
		4	-.1247*	.0245	.000	-.192	-.058
		5	-.1529*	.0163	.000	-.198	-.108
	3	1	.0039	.0162	.999	-.040	.048
		2	.1091*	.0197	.000	.055	.163

	3	1	-.0907*	.0308	.027	-.175	-.007
		2	.0927	.0359	.073	-.005	.191
		4	-.0752	.0446	.441	-.197	.046
		5	-.1126*	.0285	.001	-.190	-.035
	4	1	-.0154	.0409	.996	-.127	.096
		2	.1680*	.0448	.002	.046	.290
		3	.0752	.0446	.441	-.046	.197
		5	-.0373	.0392	.876	-.144	.070
	5	1	.0219	.0223	.863	-.039	.083
		2	.2053*	.0289	.000	.126	.284
		3	.1126*	.0285	.001	.035	.190
		4	.0373	.0392	.876	-.070	.144
Cleanliness	1	2	.1078*	.0268	.001	.035	.181
		3	.0422	.0260	.482	-.029	.113
		4	-.0270	.0349	.938	-.122	.068
		5	-.0732*	.0187	.001	-.124	-.022
	2	1	-.1078*	.0268	.001	-.181	-.035
		3	-.0656	.0307	.206	-.149	.018
		4	-.1348*	.0385	.004	-.240	-.029
		5	-.1810*	.0249	.000	-.249	-.113
	3	1	-.0422	.0260	.482	-.113	.029
		2	.0656	.0307	.206	-.018	.149
		4	-.0692	.0380	.362	-.173	.035
		5	-.1154*	.0240	.000	-.181	-.050
	4	1	.0270	.0349	.938	-.068	.122
		2	.1348*	.0385	.004	.029	.240
		3	.0692	.0380	.362	-.035	.173
		5	-.0463	.0334	.638	-.138	.045
	5	1	.0732*	.0187	.001	.022	.124
		2	.1810*	.0249	.000	.113	.249
		3	.1154*	.0240	.000	.050	.181
		4	.0463	.0334	.638	-.045	.138
Service	1	2	.1633*	.0270	.000	.090	.237
		3	.0644	.0253	.082	-.005	.134
		4	.0141	.0341	.994	-.079	.107
		5	-.0729*	.0183	.001	-.123	-.023
	2	1	-.1633*	.0270	.000	-.237	-.090
		3	-.0988*	.0306	.011	-.182	-.015

	4		-0.1492*	.0382	.001	-.253	-.045
	5		-.2362*	.0251	.000	-.305	-.168
3	1		-.0644	.0253	.082	-.134	.005
	2		.0988*	.0306	.011	.015	.182
	4		-.0503	.0370	.654	-.151	.051
	5		-.1373*	.0234	.000	-.201	-.074
4	1		-.0141	.0341	.994	-.107	.079
	2		.1492*	.0382	.001	.045	.253
	3		.0503	.0370	.654	-.051	.151
	5		-.0870	.0326	.060	-.176	.002
5	1		.0729*	.0183	.001	.023	.123
	2		.2362*	.0251	.000	.168	.305
	3		.1373*	.0234	.000	.074	.201
	4		.0870	.0326	.060	-.002	.176
Overall	1	2	.2114*	.0269	.000	.138	.285
		3	.0578	.0248	.137	-.010	.126
		4	.0446	.0339	.682	-.048	.137
		5	-.0507*	.0181	.042	-.100	-.001
	2	1	-.2114*	.0269	.000	-.285	-.138
		3	-.1536*	.0304	.000	-.237	-.071
		4	-.1668*	.0382	.000	-.271	-.063
		5	-.2621*	.0252	.000	-.331	-.193
	3	1	-.0578	.0248	.137	-.126	.010
		2	.1536*	.0304	.000	.071	.237
		4	-.0131	.0367	.996	-.113	.087
		5	-.1085*	.0230	.000	-.171	-.046
	4	1	-.0446	.0339	.682	-.137	.048
		2	.1668*	.0382	.000	.063	.271
		3	.0131	.0367	.996	-.087	.113
		5	-.0953*	.0326	.029	-.184	-.006
	5	1	.0507*	.0181	.042	.001	.100
		2	.2621*	.0252	.000	.193	.331
		3	.1085*	.0230	.000	.046	.171
		4	.0953*	.0326	.029	.006	.184

*. The mean difference is significant at the 0.05 level.

Multiple Comparisons 2

Games-Howell

Dependent Variable	1,2,3,4,5	1,2,3,4,5	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Value	1	2	.3187*	.0229	.000	.256	.381
		3	-.0650	.0258	.087	-.135	.005
		4	.0498	.0369	.661	-.051	.151
		5	-.0130	.0195	.964	-.066	.040
	2	1	-.3187*	.0229	.000	-.381	-.256
		3	-.3837*	.0281	.000	-.460	-.307
		4	-.2688*	.0386	.000	-.374	-.163
		5	-.3316*	.0225	.000	-.393	-.270
	3	1	.0650	.0258	.087	-.005	.135
		2	.3837*	.0281	.000	.307	.460
		4	.1148*	.0404	.036	.005	.225
		5	.0520	.0254	.244	-.017	.121
	4	1	-.0498	.0369	.661	-.151	.051
		2	.2688*	.0386	.000	.163	.374
		3	-.1148*	.0404	.036	-.225	-.005
		5	-.0628	.0367	.427	-.163	.037
	5	1	.0130	.0195	.964	-.040	.066
		2	.3316*	.0225	.000	.270	.393
		3	-.0520	.0254	.244	-.121	.017
		4	.0628	.0367	.427	-.037	.163
Location	1	2	.1626*	.0132	.000	.127	.199
		3	.0261	.0146	.376	-.014	.066
		4	.0627*	.0211	.025	.005	.121
		5	.0177	.0107	.462	-.011	.047
	2	1	-.1626*	.0132	.000	-.199	-.127
		3	-.1365*	.0163	.000	-.181	-.092
		4	-.0999*	.0224	.000	-.161	-.039
		5	-.1449*	.0130	.000	-.180	-.110
	3	1	-.0261	.0146	.376	-.066	.014
		2	.1365*	.0163	.000	.092	.181
		4	.0366	.0232	.513	-.027	.100

		2	.3115*	.0270	.000	.238	.385
		4	.0743	.0387	.308	-.031	.180
		5	.0067	.0242	.999	-.059	.073
	4	1	-.0898	.0354	.083	-.186	.007
		2	.2373*	.0371	.000	.136	.339
		3	-.0743	.0387	.308	-.180	.031
		5	-.0675	.0352	.308	-.164	.029
	5	1	-.0223	.0184	.744	-.072	.028
		2	.3048*	.0216	.000	.246	.364
		3	-.0067	.0242	.999	-.073	.059
		4	.0675	.0352	.308	-.029	.164
Cleanliness	1	2	.2166*	.0195	.000	.163	.270
		3	-.0256	.0214	.754	-.084	.033
		4	.0512	.0312	.472	-.034	.136
		5	-.0165	.0162	.846	-.061	.028
	2	1	-.2166*	.0195	.000	-.270	-.163
		3	-.2422*	.0238	.000	-.307	-.177
		4	-.1655*	.0329	.000	-.255	-.076
		5	-.2331*	.0192	.000	-.286	-.181
	3	1	.0256	.0214	.754	-.033	.084
		2	.2422*	.0238	.000	.177	.307
		4	.0767	.0340	.160	-.016	.170
		5	.0091	.0211	.993	-.049	.067
	4	1	-.0512	.0312	.472	-.136	.034
		2	.1655*	.0329	.000	.076	.255
		3	-.0767	.0340	.160	-.170	.016
		5	-.0677	.0310	.186	-.152	.017
	5	1	.0165	.0162	.846	-.028	.061
		2	.2331*	.0192	.000	.181	.286
		3	-.0091	.0211	.993	-.067	.049
		4	.0677	.0310	.186	-.017	.152
Service	1	2	.2526*	.0197	.000	.199	.306
		3	.0040	.0217	1.000	-.055	.063
		4	.1020*	.0321	.013	.014	.190
		5	-.0029	.0163	1.000	-.047	.042
	2	1	-.2526*	.0197	.000	-.306	-.199
		3	-.2486*	.0241	.000	-.314	-.183
		4	-.1506*	.0337	.000	-.243	-.059

		5		-.2555*	.0193	.000	-.308	-.203
	3	1		-.0040	.0217	1.000	-.063	.055
		2		.2486*	.0241	.000	.183	.314
		4		.0980*	.0349	.041	.003	.193
		5		-.0069	.0214	.998	-.065	.051
	4	1		-.1020*	.0321	.013	-.190	-.014
		2		.1506*	.0337	.000	.059	.243
		3		-.0980*	.0349	.041	-.193	-.003
		5		-.1049*	.0318	.009	-.192	-.018
	5	1		.0029	.0163	1.000	-.042	.047
		2		.2555*	.0193	.000	.203	.308
		3		.0069	.0214	.998	-.051	.065
		4		.1049*	.0318	.009	.018	.192
Overall	1	2		.3311*	.0188	.000	.280	.382
		3		-.0072	.0203	.997	-.063	.048
		4		.1163*	.0301	.001	.034	.199
		5		.0069	.0155	.992	-.035	.049
	2	1		-.3311*	.0188	.000	-.382	-.280
		3		-.3383*	.0227	.000	-.400	-.277
		4		-.2148*	.0317	.000	-.301	-.128
		5		-.3242*	.0184	.000	-.374	-.274
	3	1		.0072	.0203	.997	-.048	.063
		2		.3383*	.0227	.000	.277	.400
		4		.1235*	.0327	.001	.034	.213
		5		.0141	.0200	.955	-.040	.069
	4	1		-.1163*	.0301	.001	-.199	-.034
		2		.2148*	.0317	.000	.128	.301
		3		-.1235*	.0327	.001	-.213	-.034
		5		-.1094*	.0299	.002	-.191	-.028
	5	1		-.0069	.0155	.992	-.049	.035
		2		.3242*	.0184	.000	.274	.374
		3		-.0141	.0200	.955	-.069	.040
		4		.1094*	.0299	.002	.028	.191

*. The mean difference is significant at the 0.05 level.