

온라인 리뷰 유용성에 영향을 미치는 요인: 가격의 조절 효과

Factors Affecting the Usefulness of Online Reviews: The Moderating Role of Price

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초 록

본 연구는 yelp.com에서 2019년 작성된 온라인 음식점 리뷰를 분석하고, 음식점 소비 의사결정 과정에서 온라인 리뷰의 유용성 결정에 영향을 미치는 요인을 탐색한다. 구체적으로 리뷰 유용성에 영향을 미칠 것으로 예상되는 요인들을 정교화 가능성 모델에 따라 분류하고, 레스토랑의 가격대에 따라 그 영향이 달라질 것이라고 가정하였다. 2020년 2월 yelp.com에서 제공한 데이터 중, 미국 네바다주에 위치한 Food and Restaurant 카테고리에 속하는 업체들의 온라인 리뷰를 분석 대상으로 하였다. 음이항회귀분석 결과, 리뷰 깊이, 가독성을 포함한 중심단서 및 리뷰 일관성, 리뷰어 인기, 리뷰어 노출을 포함한 주변 단서가 리뷰 유용성에 긍정적인 영향을 미치는 것으로 확인되었다. 또한 음식점의 가격대가 높아질수록 리뷰 유용성에 영향을 미치는 선행요인의 영향이 달라지는 것으로 확인되었다. 본 연구는 레스토랑 가격이 리뷰의 유용성에 대한 중심 및 주변 단서의 영향을 조절한다는 것을 밝혔으며, 또한 리뷰 플랫폼과 외식업에 가격에 따라 차별화된 리뷰 관리 전략의 필요성에 대한 시사점을 제공한다.

ABSTRACT

This study analyzes yelp's online restaurant reviews written in 2019 and explores the factors influencing the decision of the usefulness for online reviews in the restaurant consumption decision process. Specifically, factors expected to affect review usefulness are classified according to the Elaboration Likelihood model. Also, it is assumed that the price range of the restaurant would have a moderating role. For the analysis, datasets provided by yelp.com in February 2020 are used. Among the datasets, online reviews of businesses located in Nevada in the US and belonging to the Food and Restaurant categories are targeted. As a result of the negative binomial regression analysis, it is confirmed that the central cues including review depth and readability and the peripheral cues including review consistency, reviewer popularity, and reviewer exposure positively affect the review usefulness. It is also confirmed that the influences of antecedents that affect the review

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restaurant prices moderate the effect of the central and peripheral cues on the review usefulness. It also provides implications for the need for price-differentiated review management strategies by review platforms and restaurant businesses.

키워드 : 리뷰 유용성, 정교화 가능성 모델, 엘프닷컴, 가격
Review usefulness, Elaboration Likelihood Model, Yelp.com, Price

1. Introduction

With the advent of the Internet and the development of digital technology, consumers check online reviews and star ratings with various devices before purchasing products. After purchasing, they leave rating stars and reviews based on their experiences for other consumers. It has become a daily routine for people to share their experiences and opinions online. As the web community is formed by voluntarily gathering and participating in activities with people having common interests and purposes without time and space constraints, consumers are more likely to trust information provided by people like 'me' without a commercial intention. It was found that the majority of online consumers accept the content of the review as it is and have a purchase intention based on the reviews of other consumers [28].

Online review is one of the most important sources of information not only for consumers of search goods but also experience goods. Considering the characteristics that experience goods are difficult to evaluate before purchase [21], it can be said that the importance of online reviews is greater in experience goods. In the case of choosing restaurants, it is considered

that consumers are relatively highly dependent on online reviews [3] because it is common in everyday life, and various factors are needed to assess such as price, taste, service, atmosphere, and location, etc. Many researchers have recognized the importance of online review of restaurants and conducted related studies [24, 27, 31, 42], but there is a lack of studies dealing with restaurant characteristics such as price context, which is a very critical point for decision-making.

Therefore, this study analyzes the online restaurant reviews to examine what factors affect the usefulness of online reviews for better understanding the restaurant consumption decision process using a dataset from yelp which is one of the leading restaurant review websites in the United States. Through the Elaboration Likelihood Model, independent variables are classified with central and peripheral cues and examined whether the influence of each cue on the usefulness varies depending on the price range of the restaurants which is a moderator. Although the review characteristics affecting the review usefulness of experience goods and the moderating effect on price context were verified in a few related researches [39, 44], this study differentiated in that the research

model was constructed including a qualitative factor such as review sentiment not covered in the previous studies and much more reviews were analyzed in this study. In addition, the central and peripheral cues of online reviews were not just distinguished by the characteristics of the review and reviewer in this study. Based on the results, the research aims to contribute theoretically and practically by expanding related studies and providing new implications.

2. Literature Review

2.1 Online Reviews and Review Usefulness

One of the most important concepts in online review research is the usefulness of the review, which means that a reader recognizes that the review is useful and helpful [36]. Depending on how well an online review is written, some reviews are considered more valuable than others [35]. It is important for online platforms to keep useful reviews on websites, especially in the hospitality industry. Since it is difficult to grasp information on the quality of a product for experience goods [5], online reviews are especially important in the hospitality field, which sells products that value user emotions and experiences [36]. Several famous review websites (such as yelp.com, tripadvisor.com) ask consumers how useful each review is and

specify the number of total votes earned from other consumers at the same time. From the consumer's point of view, usefulness voting is not only a diagnostic indicator to distinguish useful reviews from other reviews [30], but also a signal that allows users to filter numerous reviews efficiently [13]. Additionally, from a retailer or platform perspective, useful reviews have the potential to increase the number of customer visit, increase the time spent on the platform, and ultimately drive business revenue [13, 25].

With the increasing effort to find useful reviews amid the flood of information, many existing studies have investigated factors and patterns that influence reviews to identify usefulness of reviews. According to previous studies, review attributes (e.g., words count of review text, star rating, readability) and reviewer attributes (e.g., reviewer identity disclosure, elite awards) have a significant impact on perceived usefulness of online reviews [1, 25, 30]. However, previous studies have limitations in that they do not sufficiently consider the qualitative factors of review contents or the attributes of place. In order to identify factors that have a positive relationship with the usefulness of online reviews, it is necessary to focus on qualitative factors such as readability and review sentiments. In addition, place attributes are an important consideration, as customer expectations may differ depending on attributes of the place being reviewed. In this context, this study intends to supplement the limitations

of previous studies, considering that customers' expectations will be different depending on the price range of restaurants.

2.2 Elaboration Likelihood Model

The Elaboration Likelihood Model (ELM) explains the human cognitive processing of information through central cues and peripheral cues. According to Petty and Caciopo [34], ELM utilizes central cues when users need to think logically for information processing, while peripheral cues are used when users are persuaded by existing ideas or superficial cues.

In the many studies of online reviews, ELM has been adopted to understand consumers' information processing. Based on ELM, the effect of online review attributes on product attitude [23], purchase intention [33], and review usefulness [1, 12, 26] has been investigated.

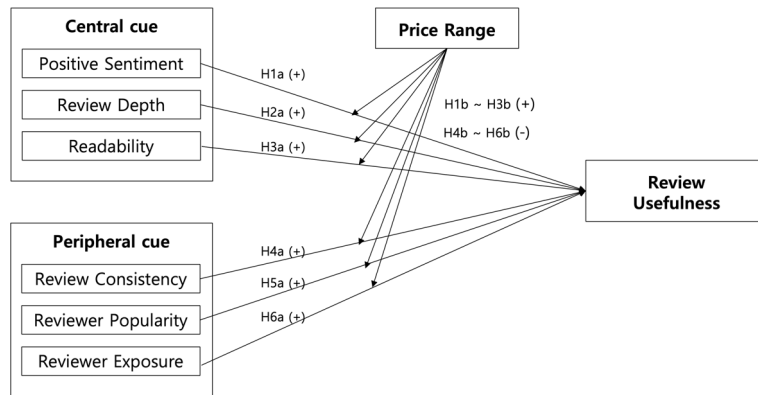
In these studies, the central cue is the content of the message use in the systematic and significant information processing [4], which can be seen as the content of the review text (e.g., word count, readability). The peripheral cue indicates the information used in intuitive and improvised information processing [4]. For the peripheral cues, review consistency and reviewer exposure are considered. Fileri et al. [12] investigated how central and peripheral cues in online customer reviews affect information diagnosticity and Lopes et al. [26] investigated the relative importance difference of the message cues to perceived review useful-

ness based on insights from ELM. Baek et al. [1] revealed how the relationship between central cue, peripheral cues and review usefulness was influenced by product characteristics (search and experience) and price. In a previous study, consumers recognized the usefulness of reviews through central cues when purchasing exploratory goods or expensive products, while they recognized usefulness through peripheral cues when purchasing experiential or inexpensive products [1].

In this study, based on the results of previous studies, we tried to not only classify the attributes of reviews into central cues and peripheral cues, but also to confirm that online reviews are perceived differently depending on restaurant prices. Specifically, the study reveals that the effect of review factors on usefulness was different according to the high and low price of a restaurant. Considering the lack of research focusing on the price of experience goods in the ELM literature, it could have important implications for understanding consumer information processing.

3. Research Hypothesis

In this study, based on the ELM, we would like to divide the factors that affect the usefulness of the review into the central and peripheral cues, and to see if the price range of the restaurant can moderate the relationship between the cues and the usefulness of the review. The



<Figure 1> Research Model

research model is as shown in <Figure 1>.

has a positive effect on the review usefulness.

3.1 Central Cues

Sentiment analysis generally refers to a method of identifying whether a review has a positive or negative opinion by mining the text of a review for a specific product and or services [43]. There are many studies related to the usefulness of the review with the positive and negative sentiment of the review message. However, there are conflicting views in the sentiment analysis of review texts which affects the usefulness of reviews. Some studies argued that negative sentiment has a significant impact on review usefulness [18, 29], while others argued that positive sentiment has significant impact [9, 10]. However, in this paper, the hypothesis is formulated based on the argument that positive sentiment of review message effects review usefulness.

H1a: Positive sentiment of the review text

Mudambi and Schuff [30] used the number of words in review messages as a tool to measure the depth of online reviews, and found a linear relationship between the number of words in online reviews and the usefulness of reviews. They showed that the longer the reviews are written, the more useful they are, because the content of the reviews provides the information needed to make purchasing decisions for consumers. Johnson and Payne [16] noted that the longer the review is, the more likely it is to contain additional clues to evaluate the product, which means the information diagnosticity is high. Kim et al. [17] also concluded in their study that the length of the review is an important factor in evaluating the usefulness of the review. Furthermore, for experience goods, descriptive and long narrative writing style of reviews are more helpful in explaining the

product's experience. Cho and Yi [8] argued that the effect of review length on the usefulness of the review can be different depending on characteristics of the product and the effect is stronger when the review is about experience goods. In this study, the following hypothesis is formulated using the number of words in the review text to measure the depth of the review based on the previous studies.

H2a: Review depth has a positive effect on the review usefulness.

Online review is an information resource that is used to gain knowledge of the products or services that consumers want to purchase. Understandability is an important qualitative factor that shows how customers accept online information from social media platforms [25]. However, according to the Selective Attention theory, people optionally respond only to messages that are essential due to limitations in information processing [37]. People usually selectively read review messages that are easy to read because they are limited in time and resources when reading reviews. Fang et al. [11] stated that a concise and easy-to-understand writing style had a positive effect on perceived usefulness, and also revealed that the increase in text readability had a positive effect on usefulness. Therefore, it can be inferred that the readability of review messages can be evaluated as an important factor in assessing whether

a review is useful or not.

H3a: The high readability of the review text has a positive effect on the review usefulness.

3.2 Peripheral Cues

Mudambi and Schuff [30] analyzed the relationship between review scores and the usefulness of reviews and found that in the case of search goods, the lower or higher the score of reviews, the more useful the reviews are. However, Baek et al. [2] showed that the score of the review does not simply affect the usefulness of the review, but how consistent the score of the review with the average score of the existing reviews affects the usefulness of the review. In addition, Cheung et al. [7] showed that the higher the consistency of information, the greater the reliability of e-WOM (electronic-Word Of Mouth). In other words, previous studies defined review consistency as a given score of a review similar to the average score of the entire reviews, and found that this affects usefulness. Review readers think the review is more reliable when the review is consistent. Therefore, it can be inferred that the consistency of review scores has a positive effect on usefulness.

H4a: Review consistency has a positive effect on the review usefulness.

According to Chaiken [4], source credibility is the recipient's trust in the source of information, and the key factor in evaluating the usefulness of online reviews depends on whether consumers trust the source of information [6]. Park and Lee [32] found that it is difficult for consumers to grasp the source credibility of e-WOM because the information provider's attributes, such as name or appearance alone cannot be the standard for determining reliability. Nevertheless, the information provider has a significant impact on consumer preferences and choices [15]. As part of solutions to enhance the intimacy and reliability of information providers and consumers by eliminating anonymity problems, the review websites not only provide basic information of reviewers, but also provide a ranking list based on various factors or allow users to follow each other to build social networks. On Yelp, users can be "Friends" with other reviewers, or "Follow" the desired person to form an online relationship connection. It is assumed that the more people follow, the greater the reviewer's network is, which indicates that the reviewer's review is evaluated to be useful. In fact, Cheng and Ho [6] found that the number of followers of the reviewer has a positive impact on the usefulness of the review. This study expects that the higher popularity derived from the number of followers, the more positive the review usefulness.

H5a: Reviewer popularity has a positive

effect on the review usefulness.

The exposure degree of the reviewer is a representative factor of the peripheral cues, constituting the characteristics of the reviewer. Mostly, people consider online reviews written by experts are more useful than non-experts, which have a significant impact on attitudes on purchase intention [20]. With the restricted clues, users cannot identify the provider's background or characteristics that they need for verifying the degree of provider's knowledge of the product online. Therefore, the reviewer's assessment of expertise is dependent on their past behaviors [40]. Kwon and Yi [19] found that high level of reviewer exposure, which means a review from reviewers who posted a lot, has a positive impact on the usefulness of the review because users are familiar with those reviewers. This can be inferred that the higher the number of reviews written by the reviewer, the higher the exposure level of the reviewer, which has a positive effect on its usefulness.

H6a: Reviewer exposure has a positive effect on the review usefulness.

3.3 Moderating Effects of Price Range

Price is an extrinsic cue of products and services and has a great influence on quality evaluation [38], and consumers have different

expectations of quality and service according to price. Several studies have considered the effects of product price on factors affecting the usefulness of reviews [2, 28, 41]. In particular, Baek et al. [1] considered the type and price of the product but found that the difference of search goods or high price and experience goods or low price. They argued that online consumers perceived online reviews as useful through central cues when purchasing search goods or expensive products, while through peripheral cues when purchasing experience goods or low-priced products. In the context of the review usefulness in experience goods, there are Zhu et al. [44] and Wang et al. [39]'s works considering the moderating effect of the price-related factor. Zhu et al. [44] studied the influence of reviewer-related factors of hotel reviews on review usefulness according to price and suggested that the effect of reviewer online attractiveness increases but the effect of reviewer expertise decreases as price increases. Meanwhile, Wang et al. [39] examined that price cues in hotel reviews effect on review helpfulness(usefulness) dependent on hotel class. They found that for low-class hotels, price cues within the reviews have more helpful(useful) votes than the reviews without price cues. The previous studies that dealt with the price as a moderating variable individually provided important insights that depending on the price, the cues that affect consumer decision-making might change, but did not show consistent and comprehensive results in terms

of information processing of reviews on experience goods.

Based on Baek et al. [1], we assume the effect of central cues on the usefulness of review is greater in reviews with the high-priced restaurant than in those with the low-price restaurant. Conversely, the effect of peripheral cues on the usefulness of review is weaker in reviews with the high-priced restaurant than in those with the low-priced restaurant. The established individual hypotheses for the moderating effect of price as follows.

H1b: The effect of review's positive sentiment on the review usefulness is greater in reviews with the high-priced restaurant than in those with the low-priced restaurant.

H2b: The effect of review depth on the review usefulness is greater in reviews with the high-priced restaurant than in those with the low-priced restaurant.

H3b: The effect of high readability of the review text on the review usefulness is greater in reviews with the high-priced restaurant than in those with the low-priced restaurant.

H4b: The effect of review consistency on the review usefulness is weaker in reviews with the high-priced restaurant than in those with the low-priced restaurant.

- H5b: The effect of reviewer popularity on the review usefulness is weaker in reviews with the high-priced restaurant than in those with the low-priced restaurant.
- H6b: The effect of reviewer exposure on the review usefulness is weaker in reviews with the high-priced restaurant than in those with the low-priced restaurant.

4. Research Methods

4.1 Data

This study used business, review, and user json file datasets provided by Yelp.com on its website in February 2020. We have selected online reviews for analyzing written in 2019 of the Food and Restaurant categories in Las Vegas. After excluding some reviews that were written for businesses other than regular restaurants, not written in English or difficult to recognize and distinguishing low and high-priced restaurants, 68,040 online reviews (2,062 restaurants and 48,563 reviewers) were collected to verify the research model. We also collected data such as business IDs, restaurant star rating, the number of restaurant reviews, review texts, review star rating, user friend lists, total number of reviews of reviewer, and average star rating users gave to the restaurants as well.

4.2 Measurement

Using the review information provided at Yelp.com, the dependent variables used in this study are the online review usefulness, which is measured by counting the number of online users who voted for the review as useful [11, 13, 25]. Independent variables are divided into central and peripheral cues along the ELM.

The central cues are positive sentiment, review depth, and readability. The score of positive sentiment analysis is calculated using the LIWC (Linguistic Inquiry and Word Count) Program [22]. The number of words for each review is counted for the depth of the review [11, 25, 30]. The readability of the review is analyzed by scoring the reviews through the Flesch-Kincaid readability tests [13], and the higher the readability value, the more difficult it is to read.

Peripheral cues include the review consistency, reviewer popularity, and reviewer exposure. The consistency of the review is calculated as the absolute value of the star rating given by each reviewer in 1-5 stars subtracted from the restaurant's average star rating granted by the entire reviewer. The popularity of the reviewer is calculated based on the number of friends a reviewer has. The reviewer's exposure level is collected by the total number of reviews written by the reviewer [8]. Finally, the price range of restaurants as a moderating variable, is shown at the restaurant's page on Yelp.com. The restaurant information shows

<Table 1> Description of variables

| Variables | Descriptions | Format |
|---------------------|---|-------------|
| Usefulness | Number of votes for usefulness | Numerical |
| Price Range | Whether price range is low (Number of \$ signs is 1) or high (Number of \$ signs is 3 or 4) | Categorical |
| Readability | How easy review text is to read and understand | Numerical |
| Positive Sentiment | Whether review is positive | Categorical |
| Review Depth | Number of words in review | Numerical |
| Review Consistency | How much review rating of the review differs from average review rating of restaurant | Numerical |
| Reviewer Popularity | Number of friends of reviewer | Numerical |
| Reviewer Exposure | Number of reviews written by reviewer | Numerical |

the approximate per capita price of a restaurant with a \$ sign.

study, to analyze the moderating effect of price range (low and high), restaurants with less than \$10 (\$) were set as low-priced restaurants, and restaurants with prices of more than \$31 (\$\$\$ and \$\$\$\$) were set as high-priced restaurants.

5. Analysis

5.1 Descriptive Statistics and Correlation Analysis

As mentioned in 4.1, restaurant reviews in Las Vegas were used in the dataset provided by yelp to verify the research model. The distribution of the restaurants according to the price range can be found in <Table 2>. In this

<Table 2> Price Range Distribution of Restaurants in Las Vegas

| Price range | Number of restaurants (%) |
|----------------------|---------------------------|
| \$ (Under \$10) | 1,866 (49%) |
| \$\$ (\$11~30) | 1,771 (46%) |
| \$\$\$ (\$31~60) | 143 (3.7%) |
| \$\$\$\$ (Over \$60) | 53 (1.3%) |

<Table 3> Descriptive Statistics of Variables

| Variables | Mean | SD | Min | Max | N |
|---------------------|----------|-----------|-----|--------|--------|
| Usefulness | 328.4367 | 2561.4030 | 0 | 85,360 | 68,040 |
| Positive Sentiment | 0.3609 | 0.4803 | 0 | 1 | 68,040 |
| Review Depth | 93.1827 | 89.3678 | 0 | 1,013 | 68,040 |
| Readability | 10.3889 | 4.8144 | 0 | 389.52 | 68,040 |
| Review Consistency | 2.9323 | 0.8104 | 0 | 4 | 68,040 |
| Reviewer Popularity | 112.0085 | 326.7446 | 0 | 8,716 | 68,040 |
| Reviewer Exposure | 85.0051 | 256.5336 | 1 | 7,626 | 68,040 |

<Table 3> shows descriptive statistics for the variables used in the analysis. The average usefulness of reviews was 328, the average number of words per review was 93.2, and the average positive sentiment score was 0.36 points. The difference in average rating of the restaurant was 2.93 points, and the average number of friends that reviewers had was 112.0, and the average number of reviews written by reviewers was 85.0.

Prior to regression analysis, Pearson correlation coefficient values were calculated and summarized as shown in <Table 4> in order to understand the correlation between variables. In this analysis, all correlation coefficient values were less than 0.8 and were found to be significant at the p-value level of 0.001. Therefore, it was found that there were no variables to be excluded from the regression analysis due to the high correlation between the variables. In addition, as a result of performing VIF verification to confirm mul-

ticollinearity, as shown in <Table 4>, the VIF value was 5 or less, and it was determined that there was no multicollinearity problem between independent variables [14].

5.2 Result of Regression and Moderating Effect

This study used the negative binomial regression model to analyze independent variables that affect the usefulness of the review. The usefulness of the review (dependent variable) is in a form of total number of votes that the review has voted to be useful, which has a specific feature that allows only integer values above zero. It is known that the poisson and negative binomial regression models are more desirable to apply when the dependent variable is a count variable which exists only in a certain interval. However, because the variance of the data is in the form of over dispersion and the poisson regression model assumes that the

<Table 4> Correlation Matrix and Values of Variance Inflation Factor (VIF)

| | Useful | Pos_Sen | Rev_Dep | Read | Rev_Con | Rev_Pop | Rev_Exp | VIF |
|---------|----------|----------|----------|---------|---------|---------|---------|------|
| Useful | 1.0000 | | | | | | | |
| Pos_Sen | -0.0531* | 1.0000 | | | | | | 1.17 |
| Rev_Dep | 0.2074* | -0.318* | 1.0000 | | | | | 1.24 |
| Read | 0.0357* | 0.0401* | 0.0989* | 1.0000 | | | | 1.02 |
| Rev_Con | 0.0408* | 0.1990* | -0.0447* | 0.0154* | 1.0000 | | | 1.05 |
| Rev_Pop | 0.6085* | -0.0531* | 0.2047* | 0.0404* | 0.0611* | 1.0000 | | 1.61 |
| Rev_Exp | 0.7023* | -0.0664* | 0.2518* | 0.0409* | 0.0827* | 0.6113* | 1.0000 | 1.65 |

Note: 1. Useful = Review Usefulness, Pos_Sen = Positive Sentiment, Rev_Dep = Review Depth, Read = Readability, Rev_Con = Review Consistency, Rev_Pop = Reviewer Popularity, Rev_Exp = Reviewer Exposure
 2. *p < 0.001.

mean and variance are the same, the negative binomial regression model is applied for the analyses [10].

<Table 5> shows the negative binomial regression results. The results of Model 1 show the effect of independent variables including reviewer popularity as one of the peripheral cues and moderating effect of the price range. All the central and peripheral cues (positive sentiment, review depth, readability, reviewer popularity) and a moderator, price range, were found to be significant predictors at the significance level of 0.001. Specifically, the hypotheses H2a, H3a, H4a, and H5a were sup-

ported, while the hypothesis H1a was found to have a negative (-) significant effect, resulting in contradictory results. For examining the moderating effect, it was found that all the interaction terms except for positive sentiment * price range were significant at $p < 0.01$. Although review depth* price range and readability* price range were significant, the buffering interaction effects are shown. Therefore, the hypothesis H4b, H5b related to the moderating effect was supported. It can be seen that the effect of price range is evenly shown in the central and peripheral cues, and the effect of central and peripheral cues on review useful-

<Table 5> Results of Negative Binomial Regression

| | Model 1 | | Model 2 | |
|---------------------|--------------|----------|---------------|---------|
| | Coef. | SE | Coef. | SE |
| Positive Sentiment | -.1504201** | .051459 | -.0259207 | .044431 |
| Review Depth | .0076407*** | .000368 | .0049817*** | .000295 |
| Readability | -.0401410*** | .004777 | -.0251680*** | .004976 |
| Review Consistency | .1541272*** | .035763 | .1055278*** | .020898 |
| Reviewer Popularity | .0056686*** | .000143 | - | - |
| Reviewer Exposure | - | - | .0144923*** | .000507 |
| Price Range | .0250091** | .0111089 | .1774328* | .085084 |
| Pos_Sen*PR | -.0031671 | .021024 | -.0269838 | .018050 |
| Rev_Dep*PR | -.0007000*** | .000145 | -.0003243** | .000109 |
| Read*PR | .0082384*** | .001876 | .0092460*** | .002139 |
| Rev_Con*PR | -.0555410** | .019746 | -.0043075 | .013090 |
| Rev_Pop*PR | -.0007904*** | .000199 | - | - |
| Rev_Exp*PR | - | - | -.0015173**** | .000215 |
| Constant | 2.785743 | | 1.879401 | |
| Alpha | 3.160562 | | 2.153042 | |
| Log-likelihood | -311451.79 | | -296535.1 | |
| AIC | 622929.6 | | 593096.2 | |
| BIC | 623048.3 | | 593214.9 | |

Note: PR = Price Range. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

<Table 6> Hypotheses Test

| | Hypothesis | Result |
|-----|---|---------------|
| H1a | Positive Sentiment → Review Usefulness (+) | Not supported |
| H1b | Positive Sentiment * Price Range → Review Usefulness (+) | Not supported |
| H2a | Review Depth → Review Usefulness (+) | Supported |
| H2b | Review Depth * Price Range → Review Usefulness (+) | Not supported |
| H3a | Readability → Review Usefulness (+) | Supported |
| H3b | Readability * Price Range → Review Usefulness (+) | Not supported |
| H4a | Review Consistency → Review Usefulness (+) | Supported |
| H4b | Review Consistency * Price Range → Review Usefulness (-) | Not Supported |
| H5a | Reviewer Popularity → Review Usefulness (+) | Supported |
| H5b | Reviewer Popularity * Price Range → Review Usefulness (-) | Supported |
| H6a | Reviewer Exposure → Review Usefulness (+) | Supported |
| H6b | Reviewer Exposure * Price Range → Review Usefulness (-) | Supported |

ness decreases as the price increase except for positive sentiment * price range. However, we formulated the hypotheses that the effect of central cues on the usefulness increases as the price increase, only two hypotheses are supported for the moderating effects.

The results of Model 2 show the effect of independent variables including reviewer exposure as one of the peripheral cues and moderating effect of the price range. Including a moderator, all independent variables except for positive sentiment were found to be significant predictors at the significance level of 0.001 in Model 2. For examining the moderating effect, it was found that the review depth, readability in central cues, reviewer exposure in peripheral cues were moderated by price range (the interaction terms are significant at $p < 0.01$). Despite some interaction terms (review depth * price range and readability * price range) were sig-

nificant, they did not support the hypothesis because the buffering moderating effects were shown as Model 1. Therefore, the hypotheses H6b related to the moderating effect were supported. In conclusion, the central and peripheral cues, except for positive sentiment, are predictors that positively affect the usefulness of review, and their influence is moderated by price range. However, the influence of both the central and peripheral cues tend to decrease as the price increases. <Table 6> shows the results of the research model hypothesis test.

6. Discussion

This study examines the factors that determine the usefulness of the online reviews when consumers go through the process of searching information on experience goods,

with the review data of restaurants collected from Yelp. Determinants are classified into central cues (positive sentiment, review depth, readability) and peripheral cues (review consistency, reviewer popularity, reviewer exposure) based on ELM. Also, the restaurant price range is set as a moderating variable to investigate if the impact of each cue on the usefulness of the review is moderated by price range. Analysis results on the effects of these variables on the review usefulness are meaningful in that they have supported the results of previous studies and have enlarged the relevant studies by examining the moderating effect of the restaurant price range.

The central cues including review depth and readability, and the peripheral cues including review consistency, reviewer popularity, and reviewer exposure, have a significant effect on the usefulness of the review. On the other hand, positive sentiment among the central cues is found to have a negative effect on the usefulness of reviews as the ratio of positive words in restaurant review messages increased, contrary to the hypothesis. While there were conflicting opinions in the previously conducted studies on sentiment analysis, in this study it was confirmed that positive sentiments have a negative effect on the usefulness of reviews in restaurant contexts.

There are differences in the processing of review information as the price range of the restaurant. The effect of review depth, readability as central cues, and reviewer popularity,

reviewer exposure as peripheral cues on the usefulness of review are weaker for a high-priced restaurant than for a low-priced restaurant. The results that the effects of peripheral cues on the usefulness of review are weaker for a high-priced restaurant are consistent with the argument of Baek et al. [1]. In addition, the result of the moderating effect on the relationship between reviewer popularity and the usefulness of review is consistent with Zhu et al. [44]'s work.

On the other hand, the results on the moderating effect related to central cues are contrary to the assumptions. Experience goods such as restaurants have very diverse factors that affect product evaluation compared to search goods, and consumers expect different services and quality depending on price, intention, and circumstances. The central cues in information processing for experience goods may be different from that of existing search goods, and it is difficult to grasp the contents of the review as the central cues in this study mainly reflect the physical characteristics of the review. Therefore, as Wang et al. [39], it is judged that it is necessary to approach the central cues in a way that consumers focus on what information they process in evaluating an experience product by considering the contents and meaning of reviews.

In practice, this study suggests that restaurant price ranges need to be considered in understanding what reviews are useful in the customer's restaurant review platforms dealing

with experience goods in retaining useful reviews for customers rather than simply retaining large amounts of reviews. This will make it easier for potential consumers to find the information they need, reduce search costs, and help them make better decisions. The results of this study are expected to be used to optimize the online review environment and systems for both review platforms representing the digital transformation and suppliers or sellers selling products and services.

6.1 Academic Implications

First, the ELM was applied to restaurant reviews. As a result of examining how the attributes of restaurant reviews affect the usefulness of reviews, it is found that both central cues and peripheral cues have a significant influence on the usefulness of the reviews. Baek et al. [1] argued that experience goods recognize usefulness through peripheral clues, but the results of this study suggest that even experience goods can differ in perceiving the review usefulness for consumers depending on product in details, and both central and peripheral cues affect restaurant products.

Second, this study examined the effect of the attributes of reviews on usefulness according to the attributes of the restaurant subject to the review. it was confirmed that the price range recognized by customers can be applied as a moderating variable. Some studies have classified product prices into high and low pri-

ces based on a certain price for a product [2], or compared between star ratings in the case of hotels [22], which are experiences similar to restaurants. However, unlike hotels that have relatively clear price range by class, restaurant businesses have many options of food to sell, which makes it difficult to clearly recognize the price level of a particular restaurant. By using the price range based on the average price range that the customer actually paid, this study could analyze the moderating effect of price range for the restaurant reviews and verified that the price range perceived by consumers could be used as a moderating variable.

Third, since this study used actual online reviews published on Yelp, it was possible to more objectively and accurately identify potential customers' perceptions of online restaurant reviews. Unlike previous studies, meaningful results could be drawn in that a large amount of data was used. In addition, it is relatively free from problems such as common method bias and generalization of questionnaire and scenario-based experimental research, which have been commonly used in online review research.

6.2 Managerial Implications

The practical implications of this study are as follows. First, from the reviewer's perspective, it is possible to write more useful reviews by understanding the central cues of reviews, that is, how other consumers perceive

a review according to the attributes of reviews. Specifically, review depth and readability have a positive effect on the usefulness of restaurant reviews. Therefore, reviewers can increase the usefulness of the reviews they write by writing a lengthy review containing information about the restaurant or making it easy for consumers to read when writing a review. On the other hand, in the context of a restaurant, highlighting positive sentiment is not important because positive reviews do not affect review usefulness.

Second, from the perspective of the review platform, it is necessary to recognize the importance of the peripheral cues of the review and utilize them. According to this study, review consistency, reviewer popularity, and reviewer exposure have positive effects on review usefulness. Therefore, the review platform can help consumers quickly find and utilize useful reviews among numerous reviews, by creating a system that makes it easier for reviewers to connect with more friends within the platform and improving the system so that consumers can easily recognize reviewers who have written many reviews. In addition, since consumers perceive that the higher the consistency of the review, the more useful the review, so prioritizing the exposure of reviews similar to the average rating can also be a way to contribute on reducing the review search cost for consumers.

Finally, this study raises the need for restaurant managers or marketers to recognize

the price range of their restaurant and understand how to manage reviews according to the price range. Specifically, when the price of a restaurant is relatively low, more attention should be paid to review depth, review readability, reviewer popularity, and reviewer exposure. For example, in restaurants with low prices, restaurants can consider marketing to reviewers who have many reviews written or are popular on the review platform. It may also be helpful to encourage customers to write useful reviews by offering small products to customers who have written long or highly readable reviews.

6.3 Limitations and Future Directions

This study has three limitations. First, there is a limit to generalization because we analyzed only reviews of restaurants located in Las Vegas, Nevada provided by Yelp.com. Las Vegas is the region that contains the most review data among the regions included in the Yelp's dataset. However, we think it will be more meaningful if the research is conducted by including other regions or comparing many regions.

Second, Yelp data categorized the price of restaurants into 1~4 levels (1st level: under \$10, 2nd level: \$11~30, 3rd level: \$31~61, 4th level: over \$60), but actually the number of restaurants in the 3rd and 4th level price range is very small compared to the 1st and 2nd level. In addition to the difference in the number of

restaurants, there are only a few consumers who frequently dine out at high-end restaurants, so there is inevitably a large difference in the total number of reviews. In the future, it will be a better research by using the research methods that control these biases.

In addition, since the helpful votes and reviews are accumulated over time, usefulness and review consistency among variables can be affected by time. For this reason, we think that more sophisticated results could be obtained if the effect of time is controlled.

Finally, it is necessary to study other characteristics of the restaurant as a moderating variable through future research. As the attributes of the review itself are various, the products or services that review covers also have characteristics. Therefore, future research may provide useful information not only to consumers who read reviews but also to restaurant businesses by categorizing restaurants in various criteria to see how the effects of cues on the review usefulness vary. Moreover, it is also necessary to include analysis of reviews written in as many languages as possible in future studies. In areas where many foreign tourists visit or where a large number of specific foreigners reside, reviews written in both English and foreign languages may feel useful to more people than reviews written in English. If these points are supplemented through future research, more meaningful results can be derived.

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