경영학석사 학위논문

Impacts of Employer Online Reviews' Qualitative Factors on Review Helpfulness

리뷰 유용성에 대한 기업 온라인 리뷰의

질적인 측면의 영향 실증 분석

2023년 8월

서울대학교 대학원

경영학과 경영정보 전공

우 성 준

Impacts of Employer Online Reviews' Qualitative Factors on Review Helpfulness

리뷰 유용성에 대한 기업 온라인 리뷰의
질적인 측면의 영향 실증 분석

지도 교수 조 우 제

이 논문을 경영학석사 학위논문으로 제출함

2023 년 5 월

서울대학교 대학원

경영학과 경영정보 전공

우 성 준

우성준의 경영학석사 학위논문을 인준함

2023 년 7 월

위 원 장 _____ 유병준 _____ (인)

부위원장 _____ 박진수 _____ (인)

위   원 _____ 조우제 _____ (인)

Abstract

Impacts of Employer Online Reviews'
Qualitative Factors on Review Helpfulness

Sung Jun Woo
Management Information Systems
Graduate School of Business
Seoul National University

Employer online reviews are now a crucial source of information for job seekers, providing insights into various aspects of a company. Unlike product online reviews, employer reviews include multiple dimensions such as reviewer demographics and evaluations of various organizational attributes. Grounded in Spence's (2002) signaling theory, the research explores the role of review qualitative factors within reviews as signals that reduce information asymmetry, bolster the credibility of the reviewer, and consequently, amplify the perceived helpfulness of the review. We examined review helpfulness based on the qualitative characteristics of reviews, utilizing a publicly accessible dataset from Glassdoor. For the analysis, a Tobit regression model was employed, suitable for dealing with our left-censored data distribution. Our findings highlight the crucial influence of review readability, comprehensiveness, completeness, and managerial response on review helpfulness. By proposing innovative measures for review comprehensiveness and completeness, this research enhances our knowledge of the qualitative factors that underpin review helpfulness in the realm of online employer reviews.

Keywords: Online employer review, review helpfulness, review qualitative factor, readability, review comprehensiveness, review completeness, Tobit regression model, signaling theory, information asymmetry
Student Number: 2021-21011

Table of Contents

List of Tables and Figures

Chapter 1. Introduction

1.1. Research motivation and background

98% of shoppers perceive reviews to be an essential resource when making an online purchase, according to Power Reviews. Online reviews, a form of electronic Word of Moth (eWOM), enable individuals to engage in social interactions, exchange product-related knowledge, and reach informed conclusions with computer-mediated dialogues (Blazevic et al., 2013; Hoffman and Novak, 1996). Before the advent of online employer review websites, including Glassdoor, Indeed, Jobplanet, and Blind, individuals seeking information resorted to sources created by marketers, examined third-party certificates, or engaged in traditional WOM (King et al., 2014). According to Information Foraging theory (Pirolli and Card, 1999), individuals actively seek out and efficiently use information based on their goals and the perceived value of the information. When it comes to job seekers that are eager to learn as much as they can, providing pertinent well-organized information online can help them make decisions.

Individuals' perceptions of a firm as a place to work are no longer only determined and affected by the corporation, but also by external third parties (Dineen, et al., 2019). Potential applicants acquire information from organization-controlled sources and from online review website, where former, current, and potential employees share and read evaluations of employers (Dabirian, et al., 2017) because such employer reviews effectively represent and capture attributes and

employee perceptions of firms (Dabirian et al., 2019). Especially, employer reviews offer exclusive knowledge about their employers and are generally motivated to provide truthful feedback due to the advantages that go along with contributing to the public good (Lerner and Tirole, 2002). According to a recent Glassdoor research, more than 80% of job searchers read these reviews before submitting their applications (Glassdoor, 2019). Employer review website users deemed such evaluations by current and former employees as more credible than accolades the company had earned (Melián and Bulchand, 2017).

Prior studies on online reviews have mostly emphasized on product reviews (Amazon.com), restaurant reviews (Yelp), hotel/host reviews (Hotels.com, Airbnb), and travel reviews (Tripadvisor), with research on employer reviews still being scarce. Specifically, the impact of quantitative aspects of an employer review on review helpfulness has only been examined by Parameswaran et al. (2022).

1.2. Research goals and research questions

The primary goal of this research is to gain a comprehensive understanding of the relationship between qualitative factors of online employer reviews and review helpfulness. In pursuit of this, we have established the following subgoals:

1. Identify Key Qualitative Factors: Examine the existing research on employer reviews to pinpoint the crucial qualitative elements, such as review readability, review comprehensiveness, review

completeness, and company response to a review, that can influence how helpful a review is.

2. Develop a Research Model: Establish a methodological framework for quantifying and analyzing the identified qualitative factors, accounting for the unique context of employer reviews.

3. Evaluate the Impact of Qualitative Factors: Employ a Tobit regression approach to assess the impact of each qualitative factor. This approach will enable us to understand the relative significance of each factor and the extent to which they contribute to a review's perceived helpfulness.

4. Interpret and Discuss Results: Interpret the Tobit regression analysis results. Discuss the implications of the results for both review platforms and employers, considering potential strategies for enhancing the helpfulness and utility of employer reviews.

5. Provide Contributions, Implications, and Limitations: Provide contributions, practical implications, and directions for further research on employer review, highlighting areas that may benefit from additional investigation or alternative methodological approaches.

This research aims to address the question, "RQ1: What specific qualitative elements of online reviews enhance review helpfulness?" and "RQ2: To what extent do the qualitative factors of online reviews influence their perceived helpfulness to the readers?". To answer this, we employ a Tobit regression approach. This study will enhance our

understanding of the qualitative factors affecting how helpful online reviews are.

Chapter 2. Literature Review

2.1. Employer review

Online employer reviews are assessments of an employer that are composed of present or past employees posted on specialized review platforms, generally encompassing the collective experiences of the workforce (Höllig, 2021). Job seekers, compared to users searching product or restaurant reviews, rely on employer evaluations to make career choices with potentially life-altering consequences because employer reviews are written based on more extended assessment periods, whereas, reviews on products are composed based on single, casual encounters (Mukherjee et al., 2021). Additionally, employees possess exclusive knowledge about their employers and are generally motivated to provide truthful feedback due to the advantages that go along with contributing to the public good (Lerner and Tirole, 2002). Online employer reviewers can offer candid assessments about their employers while maintaining anonymity, compared to offline settings where employees can be reluctant to spread negative gossip (BusinessGrow, 2017), and employees can submit critical reviews without fear of legal repercussions (Jackson, 2016).

However, concurrently, online employer reviews are criticized for the credibility of anonymous employer reviews (Ingrassia, 2017). Glassdoor, an employer review website, has established safeguard policies and guidelines to guarantee the quality of reviews. Glassdoor's technology to detect and flag dishonest reviews and the content

moderation team keep employer reviews more reliable. Glassdoor's Cofounder and Chairperson, Rober Hohman, said that no matter if a review was flagged or not, the staff analyzes 50% of all reviews (Widdicombe, 2018). Glassdoor also has a "give-to-get" policy that requires users to contribute to the platform to gain access, resulting in more balanced reviews (Chamberlain and Smart, 2017).

Numerous studies have been conducted using employer review data that gives abundant information about employers and serves as foundation for empirical studies in contexts such as employer branding (Dabirian et al., 2017), employee satisfaction (Stamolampros et al., 2019), organizational culture (Das Swain et al., 2020), corporate performance (Luo et al., 2016), cultural difference (Chandra, 2012), and linguistic style of employer reviews (Marinescu et al., 2018).

Online employer reviews are a different form of user-generated content than online reviews of products and services, and they could lead to new research possibilities (Stamolampros et al., 2020). Given that employer review websites are widely used by the public (Westfall, 2017), research on them is still scarce.

2.2. Review helpfulness

For job seekers, it is important to explore which online employer reviews are helpful for them. Online users can utilize the "Helpful?" icon to indicate how useful a website review is by clicking on it. Review helpfulness has been widely adopted by online businesses to gauge how

customers believe a review affects their decision-making process (Mudambi and Schuff, 2010). The helpfulness vote reflects users' evaluation of a review's value and utility (Huang et al., 2015).

There are numerous variables that affect how helpful an online review is (Rietsche et al., 2019). Previous research has investigated the factors that influence how helpful a review is by taking the reviewer and review feature into account (Zheng, 2021). Reviewer-related features include source credibility (Li et al., 2013), expertise (Siering et al., 2018), reviewer's information disclosure (Forman et al., 2008), reputation (Lee and Choeh, 2016), and membership tiers (Fu et al., 2018). Review-level features include message (information) quality (Liang et al., 2014), subjectivity (Agnihotri and Bhattacharya, 2016), credibility (Filieri, 2015), readability (Liang et al., 2019), completeness (Racherla and Friske, 2012), number of reviews (Lee and Choeh, 2016), rating score, and length (Eslami et al., 2018).

2.3. Reviews' qualitative factors

2.3.1. Review readability

Review readability measures how well a person can comprehend and assimilate information pertaining to products or services, ultimately influencing the acceptance of the provided information (Zakaluk and Samuels, 1988). Liu and Park (2015), as well as Fang et al. (2016), through their respective research utilizing online reviews on Yelp.com and Tripadvisor, found a positive correlation between the

readability of reviews and the perception of their usefulness. Thus, review readability can work in predicting how readers understand it when reading and how reviews are helpful to review readers.

We examined four readability tests to determine review readability, which were used in existing research for online reviews (Liu and Park, 2015): the Flesh—Kincaid Reading Ease Index (FRE) and the Coleman—Liau Index (CLI). First, the FRE is a readability formula that measures the average number of syllables in each word and the average length of sentences (Kincaid et al., 1975). Second, the CLI is a readability formula that measures the average number of characters per word and average number of characters per sentence (Coleman and Liau, 1975). The formulas used for readability tests are outlined in Table 1. The FRE scores show how easy it is to read each review, while the CLI scores show how complex it is to understand the text (Liu and Park, 2015).

Table 1. **The readability tests**			
Readability	Typical score range	Formula	Meaning
Flesh-Kincaid Reading Ease Index (FRE)	0-100	FRE = 206.835 − (1.015 × total words ÷ total sentences) − 84.6 × (total syllables ÷ total words)	Text with a score of more than 40% can be understood by everyone. As this index's number decreases, it becomes harder to understand the text.

Coleman-Liau (CLI)	1－12	$CLI = 5.89 \times$ (characters $\div$ words) $- 0.3 \times$ (sentences $\div$ words)	The academic grade level needed to be understood. If the value is smaller, it means that it is easier to read. The score represents the grade level needed to understand the text.

2.3.2 Review comprehensiveness

Review comprehensiveness refers to "the extent to which review content is sufficiently complete and exhaustive, and a comprehensive review discusses in detail a wide variety of product dimensionality" (Fang et al., 2020). Review comprehensiveness affects people's decision-making (Zhao et al., 2015), determines review diagnosticity (Li et al., 2017), and contributes significantly to the information quality of reviews (Filieri, 2015).

This research measures comprehensiveness by the number of optional ratings/questions a reviewer or employer fills out. These categories include: (1) review ratings including career opportunities, company benefits, culture values, senior management, work-life balance, CEO approval, Business Outlook, and Recommend, (2) reviewer information including reviewer job experience and location, and (3) advice to management. Including these optional elements into a review will augment the perception of trustworthiness and expertise.

Although review comprehensiveness is important, limited research has been conducted in this area. Fang et al. (2020) discovered negative correlations between air pollution levels and review comprehensiveness using Chinese restaurant review data. Liu and Hu (2021) identified that review comprehensiveness moderates the impact of review length and extremely negative reviews on helpfulness, based on UK online restaurant review data. No studies have been conducted using employer review data to investigate review comprehensiveness.

2.3.3 Review completeness

Completeness refers to how complete and detailed an online review is and how much information it contains (Luo et al., 2013). The terms "review comprehensiveness" and "review completeness" appear synonymous but they are differentiated in this study. Here "comprehensiveness" pertains to the coverage of various optional ratings or questions in a review, while "completeness" relates to the number of job-related keywords included within the textual data of a review: "work," "culture," "money," "reward," "leisure," "health," "risk" and "time." Jung and Suh (2019) identified 30 job satisfaction factors using data from jobplanet.co.kr, including work intensity and efficiency, working hour, work-life balance, working area, salary, financial support, general welfare, growth and profitability, and attitude to change. The keyword categories "work, culture, money, reward, leisure, health, risk, and time" were selected for their holistic

encapsulation of employee experiences and perceptions within the workplace. This is mirrored in Glassdoor's rating categories like company benefits, work-life balance, and outlook. These categories broadly encompass the primary concerns and focal points of an employee.

To analyze the prevalence of these categories in the reviews, we used the Linguistic Inquiry and Word Count (LIWC-22) program. LIWC-22 is a computerized text analysis software that employs natural language processing algorithms to scrutinize text data and discern patterns of word use. For each review, this tool assigned a LIWC score to each keyword, quantifying the presence of that keyword. This method of measuring review completeness has not been used in previous research and will allow for a more nuanced and detailed understanding of the various dimensions that employees consider important, resulting in an enhanced review diagnosticity.

2.3.4 Managerial response

Managerial responses to online reviews have a broad-reaching influence, affecting the reviewer and future review readers who encounter these responses (Chen et al., 2019). Spark and colleagues (2016) argue that providing online responses can reinforce perceptions about business trustworthiness and commitment to customer care. Moreover, constructive company responses can positively influence perceptions of corporate trustworthiness (Könsgen et al., 2018). These responses signal that the company values user feedback, whether it is

endorsing reviews or addressing issues raised (Xie et al., 2014).
According to recent study, reacting to even unfavorable employer reviews
may be more advantageous to remaining silent because it may change
the attitudes and intentions of potential employees (Carpentier and Van
Hoye, 2021; Könsgen et al., 2018). Despite this, there is a dearth of
research on how managerial responses influence perceived review
helpfulness.

2.4. Signaling theory

Spence's (2002) signaling theory primarily focuses on
mitigating information asymetry between two parties. This theory is
applicable in diverse markets, including job and financial markets where
informational gaps are commonplace. The theory suggests that in the
context of job market, delivering educational qualifications can help
bridge the information gap between employers and potential employees
because an employee's worth is often not transparently communicated.
Siering et al. (2018) discovered that reviewer expertise could function
as a signal to reinforce the credibility and authenticity of a reviewer's
qualities, thereby significantly impacting the review helpfulness. In this
study, all review qualitative factors - including review readability,
comprehensiveness, completeness, and managerial response - could act as
signals to enhance the credibility of the reviewer, leading to an increased
perception of review helpfulness.

Furthermore, Job seekers typically struggle to identify various aspects of employers, creating information asymmetry (Falk et al., 2013). The transmission of valuable signals aids employers in distinguishing superior candidates, thereby improving their decision-making. In the realm of online reviews, Siering et al. (2018) identified three crucial components of this context: the signalers, the signals, and the receivers. Signalers are "individuals with insider knowledge about an- other individual, product, or service" (Siering et al., 2018), and, they are reviewers in this case. Because employees as a reviewer, who have unique insights into their organizations, are typically driven to share honest opinions (Lerner & Tirole, 2002), they can provide a helpful signal to receivers. In the context of employer reviews, the receivers are unambiguously the readers of these reviews.

Signals encapsulate all information conveyed through reviews, encompassing both ratings and text data. According to Lampe et al. (2007), they can be classified into assessment signals, which "reliably indicate possession of some quality simply through observation of the signal", and conventional signals, which "are termed assessment signals, and those that only indicate a quality through social convention." In employer reviews, ratings can be seen as conventional signals merely displaying quality, while text reviews, review comprehensiveness, and completeness may serve as assessment signals, offering detailed evaluations by past or current employees (Mukherjee et al., 2021).

In our research, we propose that qualitative aspects of reviews can function as signals, delivering valuable information to receivers (review readers), thereby decreasing informational asymmetry. We argue that providing various job-related information will offer more comprehensive understanding to review readers.. Furthermore, the inclusion of all relevant keywords in text reviews will serve as a beneficial signal to aid decision-making. Review readability, although not immediately apparent, could signal the meticulousness of the reviewer. Thus, we posit that the aforementioned qualitative aspects of reviews will serve as effective signals, enhancing review helpfulness.

2.5. Hypothesis development

We have outlined four factors that influence review quality: readability, comprehensiveness, completeness, and managerial response. In the context of a job market where information is unevenly distributed, such factors can be perceived helpful to review readers.

When information is easy to understand, readers are more likely to exert additional effort to understand it (Armstrong, 2010) and more likely to evaluate the Star Rating readily, which aids in decision-making (Korfiatis et al., 2012). Therefore, we hypothesize that:

Hypothesis 1a: FRE is positively associated with employer review helpfulness.

Hypothesis 1b: CLI is negatively associated with employer review helpfulness.

Comprehensive employer reviews offer expertise and knowledge concerning the employer, thus bolstering source credibility (Hovland et al., 1953). Source credibility is a consumer's perception of the information being trustworthy and authoritative (Coursaris and Van Osch, 2016). This element is likely to make the review more helpful. Review Completeness can be understood in a similar light. Therefore, we hypothesize that:

Hypothesis 2: Review comprehensiveness is positively associated with employer review helpfulness.

Hypothesis 3: Review completeness is positively associated with employer review helpfulness.

Even in cases where an employer denies responsibility for the problems discussed in an online employer review, compared to not responding, such an approach can lead to enhanced organizational attractiveness (Carpentier and Van Hoye, 2021). This is because denial could bolster organizational trustworthiness, which in turn has a positive correlation with organizational attractiveness, thus rendoring review readers to perceive a review more helpful. Consequently, we propose:

Hypothesis 4: Managerial response is positively associated with employer review helpfulness.

Figure 1 shows the research model.

Figure 1. Research Model
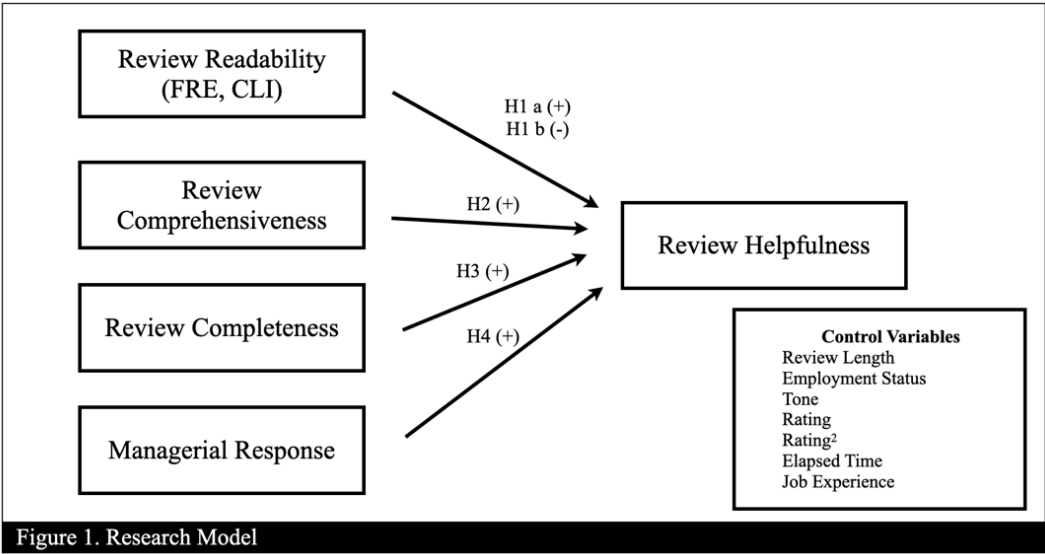
Chapter 3. Research Methodology

This section outlines the methodology utilized to address the research questions, provides the dataset used for our analysis, and defines the variables.

3.1. Data and method

The Glassdoor dataset used in this study was sourced from Sionek (2019) and made accessible via the Kaggle website. The data spans across 2012–2019 and from North/South America, Europe, Africa, Asia, and Oceania. Notably, Parameswaran et al. (2022) previously used this dataset in a study examining the effects of review and review anonymity on review helpfulness. The selection of this dataset is grounded in three core rationales: (1) Glassdoor's reputation as an employer review platform, (2) the website's provision of a multifaceted representation of employer conditions, and (3) the robustness of Glassdoor's fraud detection algorithms and human moderation team.

The dataset underwent a preprocessing stage where redundant entries and non-English reviews were eliminated using the "langdetect" Python library, leaving a total of 67,021 observations used for this research. In addressing missing data within the "Job Experiences" control variable, we used mean imputation to resolve issues. This approach replaces missing values with the mean of the data collected in that variable. This technique preserved the original distribution of "Job Experiences" while handling missing data. We

assumed the data are missing completely at random. We also implemented a winsorization technique to reduce outliers and their potential distortions. Based on data frequency, we applied winsorization at 0.5% for the readability variables FRE and CLI, and 0.2% for the helpfulness count variable. We replaced values below the 0.5% (or 0.2%) percentile and above the 99.5% (or 99.8%) percentile with the respective percentile values. This method preserves data distribution while decreasing extreme observations, making it more robust.

3.2. Variable Operationalization

The variables are categorized as follows: (1) the dependent variable is review helpfulness, (2) the independent variables are review readability, review comprehensiveness, review completeness, and managerial response and (3) the control variables include review length, reviewer employment status, emotional tone in the review, linear review rating, quadratic review rating, time lapse since the review, and the reviewer's job experience. Each of these variables is derived from individual Glassdoor review data or using a software tool.

Review length encompasses the length of the title, pros, cons, and advice to management sections, as each of these textual components contribute to informing review readers. To compute review length and emotional tone, the LIWC-22 software is employed, which was developed by Boyd et al. (2022). Both Park et al. (2021) and Karami

and Zhou (2015) have previously used LIWC in their respective research of online reviews.

Helpfulness is quantified by the number of "helpfulness" votes each review receives. Review readability is computed using each formula and denoted as FRE and CLI. Review comprehensiveness has a maximum score of 11, which corresponds to the number of optional ratings/questions a reviewer or employer fills out. It is denoted as comprehensiveness.

Review completeness, with a maximum score of 8, is quantified by the inclusion of keyword categories in a review. We used LIWC-22 to extract job-related keywords across eight categories. A score is attributed if a review incorporates any keyword from each category. Each category is compiled from a broad range of associated words, word stems, and phrases. For example, "health" encompasses words like "medic*," "patients," "physician*," and "health." "Time" is considered only if a review contains all three temporal focuses: past, present, and future. Managerial response is measured by examining the "company response" section in Glassdoor reviews, assigning a code of 1 for responses and 0 for nonresponses.

Following Parameswaran et al. (2022), we controlled for several factors because these variables have been proven to be positive or negative by previous researchers. The control variables and how they are denoted are as follows: review sentiment (Chang and Chen, 2019) as tone, reviewer employment status (Van Hoye et al., 2016) as status,

linear review rating (Baek et al., 2012) as rating, quadratic review rating (Agnihotri and Bhattacharya, 2016) as rating[2] , elapsed time (Hu and Chen, 2016) as elapsed time, and review job experience as experience. We obtained the review sentiment, an emotional tone that is "a degree of positive (negative) tone" (Boyd et al., 2022) by performing sentiment analysis function in LIWC 2022. Employment status is coded as 1 for current employees and 0 for former employees. Furthermore, we incorporate controls for review length, given the established evidence of its positive correlation with review helpfulness (Salehan and Kim, 2016). The review length is denoted as length. The variables are in Table 2. Figure 2 provides an illustration of the variables included in a Glassdoor employer review.

Table 2. **Variable definition**	
Variable	Definition
Helpfulness	Number of helpfulness votes a review receives
Review Length	Word count in pros, cons, title, advice to management, company response sections
Employment Status	Whether a reviewer is currently working at a company or not
Tone	Emotional tone in pros, cons, title, advice to management, company response sections
Rating	Linear overall rating of the review
Rating^2	Quadratic overall rating of the review
Elapsed Time	Difference between data collection year and the year when the review was written

Job Experience	Job experience of the reviewer in years
Review Comprehensiveness	The number of optional ratings/questions a reviewer fills out Optional rating/question items: (1) review ratings including career opportunities, company benefits, culture values, senior management, work-life balance, CEO approval, Business Outlook, and Recommend, (2) reviewer information including reviewer job experience and location, and (3) advice to management
Review Completeness	The number of keword categories included in a review Keyword categories: "work," "culture," "money," "reward," "leisure," "health," "risk" and "time"
Review Readability	Measurement of the degree to which a piece of text is understandable to readers based on its syntactical elements and style (Liu and Park, 2015)
Managerial response	Whether an employer responds to a review

Figure 2. Illustration of variables in an online employer review

Table 3 presents the descriptive statistics and Table 4 shows the correlations between factors. We calculated the variance inflation factors (VIFs) for the explanatory variables to assess the risk of multicollinearity. The VIFs for these are shown in Table 5. All VIFs were below the indicated cutoff of 10, with the exception of "Rating" and "Quadratic Rating," showing that multicollinearity is not a problem (Guo and Zhou, 2017). "Rating" and "Quadratic Rating" are highly correlated because the quadratic term is derived from the original linear term. This is a common includessue when includeincludeing polynomial terms in a regression model.

Table 3. **Descriptive statistics: Means, Standard Deviations, Range**				
Variable	Mean	Std. Dev	Min	Max

Helpfulness	0.9132	2.3741	0	22
Review Length	66.1990	82.1488	6	2202
Employment Status	0.6180	0.4858	0	1
Tone	74.8172	33.1877	1	99
Rating	3.8211	1.2883	1	5
Rating^2	16.2607	8.4761	1	25
Elapsed Time	1.0326	1.5783	0	11
Job Experience	2.2257	2.6597	0	10
Review Readability – FRE	42.7570	26.6444	−52.38	89.58
Review Readability – CLI	14.9352	5.4477	5.25	34.33
Review Comprehensiveness	9.7295	1.7302	0	11
Review Completeness	2.8521	1.5197	0	8
Managerial Response	0.0935	0.2912	0	1

	Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
1	Helpfulness	1												
2	Review Length	0.3898	1											
3	Employment Status	−0.0674	−0.0385	1										
4	Tone	−0.1534	−0.0928	0.1298	1									
5	Rating	−0.3263	−0.1930	0.2760	0.4214	1								
6	Rating²	−0.2842	−0.1578	0.2745	0.4011	0.9827	1							
7	Elapsed Time	0.0641	0.0133	−0.0379	−0.0063	−0.0573	−0.0732	1						
8	Job Experience	−0.0247	−0.0332	0.0274	−0.0265	−0.0209	−0.0386	0.0429	1					
9	Review Readability – FRE	0.1238	0.2430	−0.0068	−0.0010	−0.0481	−0.0185	−0.0153	−0.0899	1				
10	Review Readability – CLI	−0.1523	−0.3292	0.0042	0.0094	0.0612	0.0275	−0.0137	0.0716	−0.8365	1			
11	Review Comprehensiveness	0.1063	0.1852	0.0379	0.0047	−0.0511	−0.0321	−0.0596	0.0353	0.0567	−0.0937	1		
12	Review Completeness	0.2876	0.6263	−0.0214	−0.0027	−0.1880	−0.1678	0.0408	0.0207	0.0956	−0.1715	0.1927	1	
13	Managerial Response	0.1041	0.0989	0.0326	0.0047	−0.0127	0.0001	−0.0742	−0.0188	0.0475	−0.0573	0.0561	0.0726	1

Table 4. **Correlation analysis**

Table 5. **VIFs**	
Variable	**VIF**
Review Length	1.86
Employment Status	1.09
Tone	1.25
Rating	32.39
$Rating^2$	31.40
Elapsed Time	1.03
Job Experience	1.02
Review Readability － FRE	3.38
Review Readability － CLI	3.56
Review Comprehensiveness	1.06
Review Completeness	1.72
Managerial Response	1.02
Mean VIF	6.73

3.3. Model Specification

We used the Tobit regression model to examine the proposed effects as it presents several benefits, especially when dealing with censored dependent variables (Siering and Rajagopalan, 2018). The distribution of our data is left-censored, meaning a large number of observations accumulate at the lower boundary, and recorded beneath a certain threshold, which, in this data, is zero. Such a pattern violates the standard assumptions of homoscedasticity and normally distributed

errors associated with ordinary least squares (OLS), rendering the Tobit model a more suitable choice for this type of data distribution.

Job searchers can only mark a review as helpful on Glassdoor; they are unable to express their extreme opinions or downvote negative evaluations. Despite potentially negative assessments, the lowest helpfulness score is zero (Parameswaran et al., 2022). Consequently, in this study, we formulated the Tobit regression model as follows:

Helpfulness = β_0 + β_1*FRE + β_2*CLI + β_3*Comprehensiveness + β_4*Completeness + β_5*ManagerialResponse + β_6*ReviewLength + β_7*EmploymentStatus + β_8*Tone + β_9*Rating + β_{10}*Rating^2 + β_{11}*ElapsedTime + β_{12}*JobExperience + ε

3.4. Result

Table 5 shows the results of our Tobit regression analysis models, which demonstrate significant effects that support our hypothesis. We found that the FRE significantly and positively impacts review helpfulness (β_1 = 0.0038, p < 0.001), while the CLI exerts a negative impact (β_2 = −0.4455, p < 0.001). This shows that reviews with superior readability are perceived as more beneficial to readers, thus substantiating Hypotheses 1a and 1b. Furthermore, the comprehensiveness of reviews (β_3 = 0.2151, p < 0.001) positively correlates with helpfulness, corroborating Hypothesis 2. In conjunction with comprehensiveness, review completeness (β_4 = 0.4314, p <

0.001) positively influences its helpfulness, verifying Hypothesis 3.
Review completeness holds a high coefficient, similar to that of
employment status, suggesting that the completeness of a review is as
influential as the employment status when readers perceive review
helpfulness. Among the independent variables, managerial response
exhibited the highest coefficient, significantly and positively influencing
review helpfulness ($\beta_5 = 1.4858$, $p < 0.001$). This finding provides
strong support for Hypothesis 4. Lastly, control variables exhibited
significant effects in Models 1 and 2, except for tone, which was not
significant in Model 2.

Table 6. **Tobit model regression analysis results**						
			Model (1)		Model (2)	
			Control variables		All variables	
Hypothesis		Variable	Coef.	p-Value	Coef.	p-Value
		Constant	3.7364	<0.001***	0.6560	<0.001***
	H1a	Readability - FRE			0.0038	<0.001***
	H1b	Readability - CLI			−0.4455	<0.001***
	H2	Review comprehensive-ness			0.2151	<0.001***
	H3	Review completeness			0.4314	<0.001***
	H4	Managerial response			1.4858	<0.001***
Control variables		Review Length	0.0188	<0.001***	0.0122	<0.001***
		Employment Status	0.5747	<0.001***	0.4955	<0.001***
		Tone	0.0025	<0.01**	−0.0003	0.674
		Rating	−4.3982	<0.001***	−3.9787	<0.001***
		Rating^2	0.4949	<0.001***	0.4428	<0.001***
		Elapsed Time	0.3568	<0.001***	0.3883	<0.001***
		Job Experience	−0.0453	<0.001***	−0.0525	<0.001***
		$p > \chi^2$		<0.001***		<0.001***
		Pseudo R^2		0.0905		0.0990
		∇ Pseudo R^2				+0.0085
*, **, and *** indicate significance at a 5%, 1%, 0.1% level.						

Chapter 4. Discussion

This research provides two significant contributions. First, it explores the qualitative dimensions of employer reviews. Within the sphere of online employer reviews, qualitative elements often hold more significance than their quantitative counterparts. This is primarily because job seekers are interested in gaining detailed information.

Second, we have developed measures for two variables, review comprehensiveness and completeness, to further the research in online employer reviews. Establishing criteria for measuring these variables is crucial, and the measurement introduced in this paper is a novel approach. To measure review comprehensiveness, we utilized multiple optional ratings/questions provided by Glassdoor, determining the number of optional ratings/questions a reviewer fills out in each review, and assigning scores accordingly. For review completeness, we employed LIWC-22 analysis to count the number of job-related keywords embedded within text.

This research also carries three practical implications. Firstly, online employer review platforms can enhance their user interfaces and experiences by featuring reviews that have been deemed helpful on their main page, thus facilitating easy access to more readable, comprehensive, and complete information for their users. Furthermore, such platforms can incorporate a scoring system that scores and sifts through reviews, incentivizing users to improve their review quality in future submissions. This strategy could progressively diminish the

presence of low-quality contributions and enhance the platforms'
credibility.

Secondly, because Glassdoor allows employers to feature a review
they want to show on a first review page, employers can find the most
helpful review based on review's qualitative factors.

Thirdly, employers can foster a positive rapport with job seekers
and potential employees by responding to employer reviews, as these
reviews are often scrutinized. Furthermore, our Tobit regression analysis
confirms that, among independent variables, managerial response carries
the highest coefficient, indicating its paramount importance in perceived
review helpfulness. Since many companies perceive responding to
employer reviews not as a strategic tool for relationship building but
rather as a means to address customer concerns (Park and Allen,
2013), seizing this opportunity to interact with reviews can offer
employers a distinct edge.

Chapter 5. Conclusion

In conclusion, our study investigated the influence of qualitative aspects of online employer reviews of review helpfulness. We discovered that factors such as review readability, comprehensiveness, completeness, and managerial response of reviews positively influence their helpfulness.

However, this study is not without its limitations, providing avenues for future research. Firstly, our dataset excluded Glassdoor's "Diversity & Inclusion" rating option. Future research could benefit from manually scraping these data.

Secondly, additional aspects such as CEO approval and business outlook could be considered as independent variables in future investigations. Given that we employed numerous optional ratings and questions merely to verify their inclusion in each review, it would be interesting to investigate how each of these individual factors affects the review usefulness.

Thirdly, future research should consider utilizing topic modeling natural language processing techniques to derive keyword categories by uncovering latent topics. Although we selected keyword categories based on a prior study that used Latent Dirichlet Allocation, it would be more precise to directly apply topic modeling.

Bibliography

Agnihotri, A., & Bhattacharya, S. (2016). Online review helpfulness: Role of qualitative factors. Psychology & Marketing, 33(11), 1006-1017.

Armstrong, J. (2010). Persuasive advertising: Evidence-based principles. Springer.

Baek, H., Ahn, J., & Choi, Y. (2012). Helpfulness of online consumer reviews: Readers' objectives and review cues. International Journal of Electronic Commerce, 17(2), 99-126.

Blazevic, V., Hammedi, W., Garnefeld, I., Rust, R. T., Keiningham, T., Andreassen, T. W., ... & Carl, W. (2013). Beyond traditional word-of-mouth: An expanded model of customer-driven influence. Journal of Service Management.

Boyd, R. L., Ashokkumar, A., Seraj, S., & Pennebaker, J. W. (2022). The development and psychometric properties of LIWC-22. Austin, TX: University of Texas at Austin, 1-47.

BusinessGrow, "Don't Review Your Employer on Glassdoor Until You Read This!", 2017, available at: https://businessesgrow.com/2017/07/26/glassdoor/.

Carpentier, M., & Van Hoye, G. (2021). Managing organizational attractiveness after a negative employer review: Company response strategies and review consensus. European Journal of Work and Organizational Psychology, 30(2), 274-291.

Chamberlain, A., & Smart, M. (2017). Give to get: A mechanism to reduce bias in online reviews. GlassDoor.

Chang, W. L., & Chen, Y. P. (2019). Way too sentimental? A credible model for online reviews. Information Systems Frontiers, 21, 453-468.

Chen, W., Gu, B., Ye, Q., & Zhu, K. X. (2019). Measuring and managing the externality of managerial responses to online customer reviews. Information Systems Research, 30(1), 81-96.

Coleman, M., & Liau, T. L. (1975). A computer readability formula designed for machine scoring. Journal of Applied Psychology, 60(2), 283.

Coursaris, C. K., & Van Osch, W. (2016). A Cognitive-Affective Model of Perceived User Satisfaction (CAMPUS): The complementary effects and interdependence of usability and aesthetics in IS design. Information & Management, 53(2), 252-264.

Dabirian, A., Kietzmann, J., & Diba, H. (2017). A great place to work!? Understanding crowdsourced employer branding. Business horizons, 60(2), 197-205.

Dabirian, A., Paschen, J., & Kietzmann, J. (2019). Employer branding: Understanding employer attractiveness of IT companies. IT professional, 21(1), 82-89.

Das Swain, V., Saha, K., Reddy, M. D., Rajvanshy, H., Abowd, G. D., & De Choudhury, M. (2020, April). Modeling

organizational culture with workplace experiences shared on glassdoor. In Proceedings of the 2020 CHI conference on human factors in computing systems (pp. 1-15).

Dineen, B. R., Hoye, G. V., Lievens, F., & Rosokha, L. M. (2019). Third party employment branding: What are its signaling dimensions, mechanisms, and sources?. In Research in personnel and human resources management (pp. 173-226). Emerald Publishing Limited.

Eslami, S. P., Ghasemaghaei, M., & Hassanein, K. (2018). Which online reviews do consumers find most helpful? A multi-method investigation. Decision Support Systems, 113, 32-42.

Falk, S., Hammermann, A., Mohnen, A., & Werner, A. (2013). Different degrees of informational asymmetry on job markets and its impact on companies' recruiting success. Journal of Business Economics, 83, 295-317.

Fang, B., Ye, Q., Kucukusta, D., & Law, R. (2016). Analysis of the perceived value of online tourism reviews: Influence of readability and reviewer characteristics. Tourism Management, 52, 498-506.

Fang, J., Hu, L., Liu, X., & Prybutok, V. R. (2020). Impact of air quality on online restaurant review comprehensiveness. Electronic Commerce Research, 1-24.

Filieri, R. (2015). What makes online reviews helpful? A diagnosticity-adoption framework to explain informational and

normative influences in e-WOM. Journal of business research, 68(6), 1261-1270.

Forman, C., Ghose, A., & Wiesenfeld, B. (2008). Examining the relationship between reviews and sales: The role of reviewer identity disclosure in electronic markets. Information systems research, 19(3), 291-313.

Glassdoor, 2019, "A Guide to the Ultimate Candidate Experience", available at: https://www.glassdoor.com/employers/blog/a-guide-tothe-ultimate-candidate-experience/

Guo, B., & Zhou, S. (2017). What makes population perception of review helpfulness: an information processing perspective. Electronic Commerce Research, 17, 585-608.

Hoffman, D. L., & Novak, T. P. (1996). Marketing in hypermedia computer-mediated environments: Conceptual foundations. Journal of marketing, 60(3), 50-68.

Höllig, C. (2021). Online employer reviews as a data source: A systematic literature review.

Hovland, C. I., Janis, I. L., & Kelley, H. H. (1953). Communication and persuasion.

Hu, Y. H., & Chen, K. (2016). Predicting hotel review helpfulness: The impact of review visibility, and interaction between hotel stars and review ratings. International Journal of Information Management, 36(6), 929-944.

Huang, A. H., Chen, K., Yen, D. C., & Tran, T. P. (2015). A study of factors that contribute to online review helpfulness. Computers in Human Behavior, 48, 17-27.

Ingrassia, R. (2017). Appearance or reality? Monitoring of employer branding in public network space: the Glassdoor case. Impresa Progetto-Electronic Journal of Management (IPEJM), 2(1), 2017-2022.

Jackson, A. E. (2016). Can My Boss or Employer Fire Me For Posting on Glassdoor?. Retrieved from Glassdoor website: https://www. glassdoor. com/blog/can-my-boss-or- employerfire-me-for-posting-on-glassdoor.

Jung, Y., & Suh, Y. (2019). Mining the voice of employees: A text mining approach to identifying and analyzing job satisfaction factors from online employee reviews. Decision Support Systems, 123, 113074.

Karami, A., & Zhou, B. (2015). Online review spam detection by new linguistic features. iConference 2015 Proceedings.

Kincaid, J. P., Fishburne Jr, R. P., Rogers, R. L., & Chissom, B. S. (1975). Derivation of new readability formulas (automated readability index, fog count and flesch reading ease formula) for navy enlisted personnel. Naval Technical Training Command Millington TN Research Branch.

King, R. A., Racherla, P., & Bush, V. D. (2014). What We Know and Don't Know About Online Word-of-Mouth: A Review and

Synthesis of the Literature. Journal of Interactive Marketing, 28(3), 167–183.

https://doi.org/10.1016/j.intmar.2014.02.001

Könsgen, R., Schaarschmidt, M., Ivens, S., & Munzel, A. (2018). Finding meaning in contradiction on employee review sites— Effects of discrepant online reviews on job application intentions. Journal of Interactive Marketing, 43(1), 165-177.

Korfiatis, N., García-Bariocanal, E., & Sánchez-Alonso, S. (2012). Evaluating content quality and helpfulness of online product reviews: The interplay of review helpfulness vs. review content. Electronic Commerce Research and Applications, 11(3), 205-217.

Lampe, C. A., Ellison, N., & Steinfield, C. (2007, April). A familiar face (book) profile elements as signals in an online social network. In Proceedings of the SIGCHI conference on Human factors in computing systems (pp. 435-444).

Lee, S., & Choeh, J. Y. (2016). The determinants of helpfulness of online reviews. Behaviour & Information Technology, 35(10), 853-863.

Lerner, J., & Tirole, J. (2002). Some simple economics of open source. The journal of industrial economics, 50(2), 197-234.

Li, J., Ge, Y., Hong, Y., Cheema, A., & Gu, B. (2017). Textual review dimensionality and helpfulness: A multi-method study. Available at SSRN 2931934.

Li, M., Huang, L., Tan, C. H., & Wei, K. K. (2013). Helpfulness of online product reviews as seen by consumers: Source and content features. International Journal of Electronic Commerce, 17(4), 101-136.

Liang, S., Schuckert, M., & Law, R. (2019). How to improve the stated helpfulness of hotel reviews? A multilevel approach. International Journal of Contemporary Hospitality Management, 31(2), 953-977.

Liang, Y., DeAngelis, B. N., Clare, D. D., Dorros, S. M., & Levine, T. R. (2014). Message characteristics in online product reviews and consumer ratings of helpfulness. Southern Communication Journal, 79(5), 468-483.

Liu, Y., & Hu, H. F. (2021). Online review helpfulness: the moderating effects of review comprehensiveness. International Journal of Contemporary Hospitality Management, 33(2), 534-556.

Liu, Z., & Park, S. (2015). What makes a useful online review? Implication for travel product websites. Tourism management, 47, 140-151.

Luo, C., Luo, X. R., Schatzberg, L., & Sia, C. L. (2013). Impact of informational factors on online recommendation credibility: The moderating role of source credibility. Decision Support Systems, 56, 92-102.

Luo, N., Zhou, Y., & Shon, J. (2016). Employee satisfaction and corporate performance: Mining employee reviews on glassdoor. com.

Melián-González, S., & Bulchand-Gidumal, J. (2017). Why Online Reviews Matter for Employer Brand: Evidence from Glassdoor.

Mudambi, S. M., & Schuff, D. (2010). Research note: What makes a helpful online review? A study of customer reviews on Amazon. com. MIS quarterly, 185-200. 26

Mukherjee, P., Parameswaran, S., & Valecha, R. (2021). Investigating the Effect of Multidimensional Review Text and Anonymity on Review Helpfulness: An Empirical Investigation in the Context of Employer Review Sites. Hawaii International Conference on System Sciences. https://doi.org/10.24251/HICSS.2021.526

Parameswaran, S., Mukherjee, P., & Valecha, R. (2023). I Like My Anonymity: An Empirical Investigation of the Effect of Multidimensional Review Text and Role Anonymity on Helpfulness of Employer Reviews. Information Systems Frontiers, 25(2), 853-870.

Park, H., Jiang, S., Lee, O. K. D., & Chang, Y. (2021). Exploring the attractiveness of service robots in the hospitality industry: analysis of online reviews. Information Systems Frontiers, 1-21.

Park, S. Y., & Allen, J. P. (2013). Responding to online reviews:
Problem solving and engagement in hotels. Cornell Hospitality
Quarterly, 54(1), 64-73.

Racherla, P., & Friske, W. (2012). Perceived 'usefulness' of online
consumer reviews: An exploratory investigation across three
services categories. Electronic commerce research and
applications, 11(6), 548-559.

Rietsche, R., Frei, D., Stöckli, E., & Söllner, M. (2019). Not all
Reviews are Equal-a Literature Review on Online Review
Helpfulness. European Conference on Information Systems,
Stockholm-Uppsala, Sweden.

Salehan, M., & Kim, D. J. (2016). Predicting the performance of
online consumer reviews: A sentiment mining approach to big
data analytics. Decision Support Systems, 81, 30-40.

Siering, M., Muntermann, J., & Rajagopalan, B. (2018). Explaining
and predicting online review helpfulness: The role of content and
reviewer-related signals. Decision Support Systems, 108, 1-12.

Sionek, A. (2019). Data Jobs Listings - Glassdoor. https://doi.org/10.
34740/KAGGLE/DS/418397

Sparks, B. A., So, K. K. F., & Bradley, G. L. (2016). Responding to
negative online reviews: The effects of hotel responses on
customer inferences of trust and concern. Tourism
Management, 53, 74-85.

Spence, M. (2002). Signaling in retrospect and the informational
structure of markets. American economic review, 92(3), 434-
459.

Stamolampros, P., Korfiatis, N., Chalvatzis, K., & Buhalis, D.
(2020). Harnessing the "wisdom of employees" from online
reviews. Annals of Tourism Research, 80.

Van Hoye, G., Weijters, B., Lievens, F., & Stockman, S. (2016).
Social influences in recruitment: When is word-of-mouth most
effective?. International Journal of Selection and
Assessment, 24(1), 42-53.

Westfall, B. (2017). How job seekers use Glassdoor reviews. Retrieved
May, 1, 2020.

Widdicombe, L. (2018). Improving workplace culture, one review at a
time. The New Yorker.

Xie, K. L., Zhang, Z., & Zhang, Z. (2014). The business value of
online consumer reviews and management response to hotel
performance. International Journal of Hospitality Management,
43, 1-12.

Zakaluk, B. L., & Samuels, S. J. (1988). Readability: Its Past,
Present, and Future. International Reading Association, 800
Barksdale Rd., PO Box 8139, Newark, DE l9714-8139 (Book
No. 795, $6.25 member, $9.50 nonmember).

Zhao, X., Wang, L., Guo, X., & Law, R. (2015). The influence of
online reviews to online hotel booking intentions. International

Journal of Contemporary Hospitality Management, 27(6),
1343-1364.

Zheng, L. (2021). The classification of online consumer reviews: A
systematic literature review and integrative framework. Journal
of Business Research, 135, 226-251.

국문 초록

리뷰 유용성에 대한 기업 온라인 리뷰의 질적인 측면의 영향 실증 분석

우성준

서울대학교 대학원

경영학과 경영정보 전공

오늘날 기업 온라인 리뷰는 구직자에게 회사의 다양한 측면에 대한 정보를 제공하는 중요한 정보가 되었다. 제품 온라인 리뷰와는 달리 기업 온라인 리뷰는 리뷰어의 개인적인 특성과 기업의 다양한 측면에 대한 평가 등 다양한 평가 및 질문 항목이 있다. Spence(2002)의 신호 이론에 근거한 이 연구는 정보 비대칭성을 줄이고 리뷰어의 신뢰성을 강화하며 결과적으로 리뷰 유용성을 증가시키는 신호로서 리뷰 내 리뷰의 질적 요인의 역할을 연구한다. 본 연구는 리뷰의 질적 특성을 기반으로 리뷰의 유용성을 조사했다. 공개된 Glassdoor 데이터셋을 이용하였고, 좌측 절단된(left-censored) 데이터 분포를 처리하는데 적합한 토빗 회귀 모델을 적용하여 리뷰의 유용성에 영향을 미치는 리뷰의 질적 요인을 분석했다. 연구 결과, 리뷰 가독성, 포괄성, 완전성, 기업의 반응이 각각 리뷰 유용성에 영향을 미치는 것으로 나타났다. 본 연구는 리뷰의 포괄성과 완전성에 대한 새로운 측정 방법을 도입하여 온라인 기업 리뷰의 유용성에 영향을 미치는 질적 요인을 이해를 높이는데 기여했다.

주요어: 온라인 기업 리뷰, 리뷰 유용성, 리뷰 질적 요인, 가독성, 리뷰 포괄성, 리뷰 완전성, 토빗 회귀 모형, 신호 이론, 정보 비대칭

학 번: 2021-21011