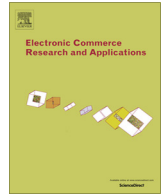




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## Research on the interactive effects of online scores



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### ABSTRACT

With the popularity of online shopping, more and more consumers are making their decisions according to online reviews. However, studies on the effects of online scores produce different results, even for the same products. This study analyzes the impact of online scores from the perspective of the interaction between the different forms of online scores to provide a reasonable explanation of the inconsistency of the research results in this regard. The results of this study demonstrate that the effect of the overall score is negatively affected by the difference between the weighted score and the overall score itself. Moreover, it is also positively influenced by the difference between the overall score of one product and those of its substitutes. While considering the difference between the sub-dimensional scores and the overall score, its influence on the effect of the overall score is insignificant. This research theoretically validates the interactive effects of online scores and provides the basis for an online-score-based operation.

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### 1. Introduction

The development of the Internet has provided an opportunity for the rapid expansion of e-commerce, making online shopping one of the major forms of consumption. This also prompts consumer focus on online reviews. According to a survey by DoubleClick.com, more than 50% of consumers use a search engine to find review information provided by the previous consumers before their purchases (Row 2006). These data have risen to 83.4% based on the latest report of the China Internet Network Information Center in August 2013. A report from IResearch in June 2011 also indicates that 81.8% of the audiences obtain information about movies via the Internet. All of these examples indicate that online reviews are playing an important role in eliminating consumer uncertainty and helping with decision making for purchases (Clemons et al. 2006).

Many studies on online reviews have been performed in recent years. The majority of studies on the effects of online reviews on sales focus on the review volume and scores. However, such studies have provided different conclusions. This phenomenon is particularly prominent in the research regarding online scores. Certain scholars note that online scores have a positive impact on product sales (Clemons et al. 2006; Dellarocas et al. 2007; Lu and Feng 2009; Ye et al. 2009; Rui et al. 2013), while other studies

indicate the irrelevant relationship between them (Liu 2006; Karniouchina 2011). Many scholars have taken online movies and other experiential products as the subject of their research and drawn different conclusions. Dellarocas et al. (2007) reveal the positive effect of the average value of online scores on the box office. Duan et al. (2008) find no significant correlation between the daily box office and the average rating of reviews. Regarding the above differences in the results, certain scholars note that the impact of online scores on the sales of products is moderated by certain factors, such as review related factors (including the volume of reviews, etc.) (Khare et al. 2011; Gopinath et al. 2013), reviewer related factors (Forman et al. 2008; Hu et al. 2008), product related factors (Park and Lee 2009; Lee et al. 2011; Yang et al. 2012), and consumer related factors (Park and Kim 2008). However, no systematic analyses of such inconsistencies have been made to date, and the interpretation of the existing research is not sufficient.

Currently, the numerous review websites provide not only the overall score (or average score) but also other multi-dimensional scores (Li and Hitt 2010). Taking an online movie as an example, the scores concerning a specific movie include the overall score, the sub-dimensional score (such as the score of impression and storyline), the score of other similar movies, and so on. The review websites may also provide the information about the score distribution, i.e., the score levels and corresponding proportions (see Fig. 1). All of these scores provide general information to help consumers to make their final decisions. A higher overall score indicates a greater possibility on the part of the consumers to decide

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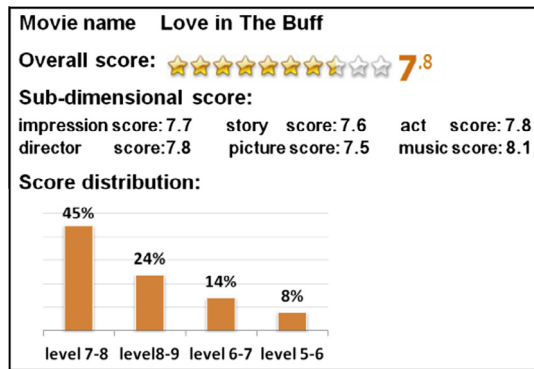


Fig. 1. Movie reviews as an example.

to purchase the product. A low sub-dimensional score may lead to a denial of consumption. This indicates the interaction and mutual dependence of the overall score and other types of scores, which jointly affect the final consumption decision.

On such a basis, this study tests the abovementioned phenomenon through empirical analysis to reveal the interaction between the different forms of scores and to provide a reasonable explanation for the inconsistent conclusion concerning the effects of the online reviews. This study focuses on the following questions:

1. How does the overall score interact with the other types of scores?
2. How can such an interaction influence the effect of the overall score on decision making?

The rest of the paper is organized as follows. Section 2 reviews the relevant theories and establishes the hypotheses. Then, the sources of the data and variables are described in Section 3. Next, the main findings are presented and discussed in Section 4. Section 5 summarizes the significance and limitations of the research.

## 2. Theoretical basis and research hypotheses

### 2.1. Theoretical basis

#### 2.1.1. Interactive effect theory

In statistics, the interactive effect indicates the interdependence and mutual influence of two or more independent variables that jointly affect the dependent variables. If the combined effects are larger than the sum of the single factors, a synergistic effect exists between them, which is the so-called positive interactive effect; otherwise, the antagonistic effect or the negative interactive effect exists (Wen et al. 2005; Aiken and West 1991).

Most studies on the interactive effect include the product item in the regression equation for analysis. Generally, the product item in the linear regression model reflects whether there is an additive interactive effect (Aiken and West 1991; Jaccard et al. 1990).

In this research, the interactive effect between the variables refers to the mutual influence between the overall score and other scores, which jointly affect consumer decision making. This research uses the regression equation for analysis and introduces the product item as the interactive effect of the variables.

#### 2.1.2. Information Accessibility-Diagnosticity Theory & Consistency Theory

Information Accessibility-Diagnosticity Theory (Feldman and Lynch 1988) is about information utility. Information diagnosticity refers to the extent to which a piece of information is different from others. If the information can help consumers classify goods

to a unique cognitive category, it is considered to be diagnostic (Bone 1995). Information accessibility is affected by its relative comparability. Generally, more attention is paid to the more complex, abnormal or extreme information that is searched more conveniently, thus the higher accessibility and diagnosticity of such information (Bettman et al. 1998). At the same time, the theory also indicates that the individual's perceived diagnosticity of the information determines the usefulness of the information. When more diagnostic information emerges, the original information will be used less to make decisions. (Herr et al. 1991).

The Consistency Theory (Osgood and Tannenbaum 1955) is used to explore and predict the changes in peoples' original attitude to maintain their internal consistency when they receive new information. According to the theory, due to the different evaluation criteria, different people will have a similar or different attitude towards the same things or people. If one person's attitude is similar to another's, both of them do not need to change their attitude; otherwise, they change their attitude, driven by an internal force to achieve psychological consistency and harmony if they disagree with each other. This theory is validated by many scholars from different perspectives. Wilson and Hodges (1992) note that the WOMs are filtered by receivers according to their consistency with previous evaluation criteria. The information, obtained via diverse channels, will intensify consumers' attitude if it is consistent with the previous attitude toward a certain product or service; otherwise, the consumer may change their attitude according to the WOMs. Jain and Maheswaran (2000) find that highly inconsistent information can be sufficiently convincing to change the initial attitude.

In this research, a greater difference between the other types of scores and the overall score indicates the higher scrutiny and higher information accessibility and diagnosticity of the other scores. The more replaceable or comparable a product, the more attention will be paid to its scores, and the higher the information accessibility and diagnosticity, the more convincing the information is. Based on the Consistency Theory, as consumers may have different attitudes according to different scores, they may moderate their attitude based on the more convincing score information. This indicates that consumers will adjust their overall score-based attitude when other scores have higher information diagnosticity and accessibility. In this process, the attitude based on the overall score information and that based on the other scores influence each other, namely, the overall score interacts with the other scores. The following hypotheses are proposed accordingly.

### 2.2. Hypotheses

When making consumption decisions, consumers will consider the overall score, as well as other forms of scores, and judge by comparing the different types of scores of the products and services. According to the Consistency Theory, when the differences between the other forms of scores and the overall score exist, the former will precipitate the adjustment of consumer attitudes derived from the latter. The extent and direction of the adjustment depend on the strength of the differences between the two categories of scores. Combining the Information Accessibility-Diagnosticity Theory, we can infer that the significant difference between the other forms of scores and the overall score will decrease the information diagnosticity of the latter, which in turn impacts the effect of the overall score.

#### 2.2.1. The impact of the difference between score distribution and overall score

Considering the score levels and corresponding proportions (as illustrated in Fig. 1), the median of each level is used to calculate a weighted score to evaluate the impact of the score distribution.

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