Reducing Uncertainty Caused by Neutral Online Ratings and an Overload of Online Reviews

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Cite as:
Ponnamma Divakaran Pradeep Kumar, Xiong Jie (2024), Reducing Uncertainty Caused by Neutral Online Ratings and an Overload of Online Reviews . *Proceedings of the European Marketing Academy*, 52nd, (119908)

Paper from the 53rd Annual EMAC Conference, Bucharest, Romania, May 28-31, 2024

TRACK: Digital Marketing & Social Media

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Abstract

Neutral or mixed online ratings and reviews are those that express neither positive nor negative sentiment about a product and are typically provided by customers who are neither fully satisfied nor dissatisfied with their purchase. Additionally, the abundance of online reviews for each product, numbering in the hundreds and thousands, poses a challenge for consumers, who cannot feasibly read each one. The question then arises as to how consumers can reduce uncertainty about a product's quality and performance, given the abundance of reviews and the prevalence of neutral ratings. To address this question, we draw from uncertainty reduction theory, information overload theory, and the elaboration likelihood model to argue that consumers can reduce uncertainty by seeking additional independent sources of information and engaging in systematic processing, but only for less familiar or unknown products. For popular products, consumers tend to rely on the peripheral route of processing, using heuristics such as reputation (positive or negative) to reduce uncertainty, without actively seeking additional information. Our study provides insights into how consumers navigate the challenges of neutral ratings and information overload to reduce uncertainty when evaluating new products.

Keywords–Median average ratings, information overload, uncertainty reduction, brand equity, film critic ratings, adoption intention and behavior.

1. Introduction

Prior studies have shown the helpfulness of extreme ratings and reviews, such as positive or negative consumer reviews, on consumer buying decisions. However, unlike extreme ratings, average customer ratings with middle[1], median or neutral values, for example, a 3-star average rating on a 5-star scale for a movie, are not helpful, as they do not clearly state either goodness or badness. Hence, such **median average ratings (MARs)** are less likely to help reduce uncertainty about product quality and performance, and it is not clear how consumers make their buying decisions when faced with such neutral average ratings. Moreover, the number of products that receive such MAR is relatively high. Therefore, the main purpose of this study is to investigate how consumers make their adoption decisions when faced with MAR.

In addition to the abovementioned challenges of MAR, consumers also face the issue of an overload of online customer review information for each and every product. From very few reviews available immediately following a product launch, the number increases, sometimes exponentially, after just a few days or a week following launch, and the number of online reviews continues to increase with every passing day. Such a large volume of reviews creates an **information overload;** hence, there is a paradox of choice for future moviegoers, as each individual will not have the motivation or time to read and process all the thousands of online reviews (paradox of choice) before making his or her purchase decision. Therefore, the current study also investigates this issue of information overload to understand how consumers make their adoption decisions.

2. Theoretical background and hypothesis development

Most often, product quality cannot be known prior to an experience but sometimes, it can be ascertained through categorical cues such as product brand, price, country of origin etc., and such category-quality contingency inferences are shown to affect consumer choices (Vogel & Kutzner, 2017). Movies' popularity (brand equity) depends on the presence of famous cast and crew members. Therefore, a movie with weak brand equity has no popular cast or crew members; hence, moviegoers are not familiar with the movie's outcome and do not know what to expect (low expectations) from the movie because there is no prior performance-related information for the cast or crew members. A movie with strong brand equity (high popularity) indicates the

[1] The terms *middle, median and neutral* average ratings are used interchangeably throughout this manuscript, and they mean one and the same thing in this study.

presence of one or more famous cast or crew members in the movie, which creates a positive or negative mental association toward the movie.

In addition to the popularity (brand equity) of movies, another important source of product information issued by a private party rather than by the firm itself is "expert reviews" (e.g., film critics' ratings and reviews for a movie). Similar to online customer reviews, the independence of expert reviews may reduce the bias of the information provided and, hence, increase the influence on consumer demand (Flanagin & Metzger, 2013; Ling et al., 2013). However, in the presence of customer ratings and reviews, film critics are less likely to have a major impact on moviegoers, as prior studies have shown that potential buyers are more likely to trust their own peers rather than experts' evaluation of new movies (Li et al., 2013). Hence, ratings and reviews from film critics are less likely to influence moviegoers in the presence of online customer ratings and reviews, and moviegoers would ignore or are less likely to depend upon or even read film critics' reviews. In other words, online customer ratings and reviews will override the impact of film critics' ratings and reviews. Based on these arguments, the following hypotheses are formulated:

Hypothesis 1 (Moderating effects): *Product popularity (brand equity of movies) positively moderates the effect of online ratings on adoption rate, whereas additional independent information (film critics' ratings) will not have any such significant effect.*

2.1 Elaboration likelihood model and median average ratings

According to elaboration likelihood model theory, there are two different ways to persuade or to bring an attitudinal change; hence this model can better explain how people are persuaded (Cacioppo & Petty, 1984; Petty & Cacioppo, 1983; Petty & Cacioppo, 1984; Petty et al., 1983). The elaboration involves the conscious thoughts that are put into the decision-making process and the elaboration can be high or low, depending on how much or how little conscious thought is spent processing the information before decision-making (Massaro, 1988). High elaboration leads to a central route of information processing that requires critical thinking and a careful evaluation of the decision, and such decisions are more stable and less likely to change (long-lasting). In other words, a **systematic approach** is used in the central route of information processing.

A low elaboration leads to a peripheral route of information processing, in which the decisions are made without investing any critical thinking time and without any conscious

examination of information, and such decisions are less stable and not long-lasting. In this case, a decision is made based on rules of thumb, by observing what others do, or by the available positive or negative cues, for example, positive or negative brand signals (Petty et al., 1981). In other words, a **heuristic approach** (shortcut approach) is used in the peripheral route of information processing, where one uses mental shortcuts to make decisions efficiently, as it reduces effort and quickly relies on information that comes to mind quickly (for example, popular brands, where customers merely follow the positive or negative cues), or one makes quick judgement based on mental prototypes.

In the case of movies, the presence of famous star casts, or crew members provides simple cues (positive or negative cues) for potential moviegoers, since they have prior experiences watching their performances and therefore have strong associations and attitudes (positive or negative brand equity) towards those star casts or crew members. Moviegoers use these cues to arrive at a quick decision about wanting to watch the movie or not. In other words, they use mental shortcuts (heuristics) or the peripheral route of information processing to arrive at a decision in the presence of brand cues (product popularity), and brands are strong and effective signals of brand quality (Erdem & Swait, 1998; Erdem et al., 2006). However, in the absence of any famous star cast or crew members, these simple cues (brand signals) are no longer available, and moviegoers therefore cannot use the mental shortcut approach for such less popular or unknown movies. In such situations, moviegoers follow the central route of information processing and look for additional independent sources of information such as professional film critics' ratings and reviews, and carefully process the information to arrive at a decision to watch the movie or not. Moreover, unlike the information overload of online customer reviews, professional film critics' reviews are very few in number, and moviegoers are motivated to process their review information. Therefore, in the presence of simple cues (positive or negative brand signals for popular brands), moviegoers use the peripheral route of information processing (heuristic approach) and do not actively pursue any other information sources (such as film critics' ratings). Therefore, there is a negative association between product popularity and new information such as film critics' ratings. Based on the above arguments, the following hypotheses are formulated:

Hypothesis 2 (Interaction effects). For a movie with median average ratings (MAR) in the opening week, there is a negative interaction effect between *additional independent information*

(film critics' ratings) and product popularity (brand equity) on ***adoption intention*** *in the second week after the movie's release.*

Hypothesis 2a (Interaction effects of additional information (FCR) and product popularity)**.** For a movie with median average ratings (MAR) in the opening week, there is a ***positive association*** *between additional independent information (film critics' ratings) and* ***adoption intention*** *in the second week after the movie's release for less familiar or unknown movies (low brand equity) but no such positive effect on adoption intention for popular movies.*

Hypothesis 3 (Interaction effects). For a movie with median average ratings (MAR) in the opening week, there is a negative interaction effect between *additional independent information (film critics' ratings) and product popularity (brand equity) on* ***adoption rate*** *in the second week after the movie's release.*

Hypothesis 3a (Interaction effects of additional information (FCR) and product popularity). For a movie with median average ratings (MAR) in the opening week, there is a ***positive association*** *between additional independent information (film critics' ratings) and* ***adoption rate*** *in the second week after the movie's release for less familiar or unknown movies (low brand equity) but no such positive effect on adoption intention for popular movies.*

3. Research methodology

The movie industry is chosen as the empirical setting for this study. One important reason for the choice of the motion picture industry is that there are several movie-based online communities available, where members post ratings, comments, and reviews for movies that they have seen or intend to see, and most of these communities require registration to become members.

4. Key findings and discussion of results

The hypotheses are tested using multiple linear regressions in IBM SPSS Statistics 21 software. Different models are used to test different hypotheses.

****Insert Table 1 about here****

The results in Table 1 (Model 1) provide **support for Hypothesis 1**, which states that product popularity positively moderate the effect of average ratings on adoption rate (B = 0.203, Beta = 1.030, t value = 5.007 at $p < 0.001$). The R-squared value of Model 1 presented in Table 1 is 0.456^2 and F value is 37,706 at $p < 0.001$. In the regression results presented in Table 2 (Model 2), the dependent variable is **adoption intention,** and it is used to test Hypotheses H2 and H2a. In the regression results presented in Table 3 (Model 3), the dependent variable is **adoption rate,** and it is used to test Hypotheses H3 and H3a**.**

****Insert Table 2 about here****

****Insert Table 3 about here****

The interaction effect between product popularity (brand equity) and additional independent information (film critics' ratings) has a significant but negative effect on adoption intention in the second week (Ref. Table 2: B = -0.030, Beta = -3.424, t value = -2.807 at $p < 0.01$) and a similar significant and negative effect on adoption rate in the second week (Ref. Table 3: B = -0.034, Beta = -4.218, t value = -3.661 at $p < 0.001$). These results provide **support for Hypotheses 2 and 3**. The R-squared value of Model 2 presented in Table 2 is 0.198 and F value is 9,471 at $p < 0.001$ and the R-squared value of Model 3 presented in Table 3 is 0.285 and F value is 15,254 at $p < 0.001$. These interaction effects are explored further using scatterplots by grouping movies based on popularity, to (1) investigate the relationship between additional independent information (film critics' ratings) and adoption intention when popularity (brand equity) is low and high (Figure 1 below) and (2) investigate the relationship between additional independent information (film critics' ratings) and adoption rates when popularity (brand equity) is low and high (Figure 2 below).

****Insert Figure 1 about here****

Figure 1 is based on the scatterplot of the regression results presented in Model 2 (Table 2). In this analysis, the sample included only those movies that received neutral average ratings. As seen in the plot, when product popularity is low (low brand equity), additional information such as film critics' ratings (FCR) has a direct and positive impact on the adoption intention of movies (indicated by the continuous line in the plot). In other words, in the absence of simple cues such as positive or negative brand equity, moviegoers are highly motivated to look for other

information, such as film critics' ratings, and use high elaboration or the central route of information processing to process the review information to arrive at a decision whether to watch the movie or not. Thus, this provides **support to Hypothesis 2a.** Such a positive association is not seen between film critics' ratings and adoption intention when 'product popularity is high, and in fact, a negative slope is seen.

****Insert Figure 2 about here****

Figure 2 is based on the scatterplot of the regression results presented in Model 3 (Table 3). In this analysis, the sample included only those movies that received neutral average ratings. As seen in the plot, when product popularity is low (low brand equity), additional information such as film critics' ratings (FCR) has a direct and positive impact on the **adoption rate** of movies (indicated by the continuous line in the plot). In other words, in the absence of simple cues such as positive or negative brand equity, moviegoers are highly motivated to look for other independent information, such as film critics' ratings, and use high elaboration or the central route of information processing to process the review information to arrive at a decision on whether to watch the movie or not. Thus, this provides **support to Hypothesis 3a**. Such a positive association is not seen between film critics' ratings and adoption intention when product popularity is high, and in fact, a negative slope is seen.

5. Key contributions to research

The results of this study offer many important theoretical contributions. First, it contributes to the literature of consumer decision-making, especially when faced with neutral average ratings, which is largely ignored in the existing literature. Our findings demonstrate that neutral average ratings by themselves do not help reduce uncertainty; however, consumers are motivated to first look for any other readily available but easily processible information (heuristic approach or peripheral information processing) such as brand cues to help reduce uncertainty and aid in decision making. When such simple cues are unavailable, consumers will then actively pursue other information such as professional ratings and reviews that can help reduce uncertainty, and they will use the central route of information processing (systematic approach) to reduce uncertainty.

Second, this study contributes to the information overload literature by explaining the underlying mechanism of how consumers reduce uncertainty when the information that is supposed to help reduce uncertainty is overloaded. While prior research focused mainly on the

selection problem in coping with information overload, that is, how customers can use different methods to select a small subset of reviews from among the 1000s of reviews to aid in decision making, our study presented a new perspective by arguing that consumers are less motivated when there is information overload, and hence they are less likely to read these reviews as it requires high elaboration and central route of information processing. This is especially the case when simpler cues (average ratings) are easily available as it requires low elaboration and provides shortcuts.

Third, this study contributes to the ongoing discussions in the extant research about the helpfulness of average ratings and online reviews. This study further complements this area by identifying the underlying mechanism for the simultaneous effect of both average ratings and online reviews on customer decision-making, which is largely ignored in the current literature. Prior studies have focused only on the direct effect of either average ratings or online reviews on consumer decision-making, but very few on their simultaneous interaction effects. The current study argues that taking this simultaneous effect into account is very important as buyers consider both the information (not just one), and they are shown to behave differently for the same average rating value, but for a different total number of reviews.

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Table 1. The moderating effect of product popularity [a]

Model 1	Variables	Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
(To test **H1**)	(Constant)	-1.132	3.206		-.353	.724
	Average Ratings (Online Customer Ratings) in the opening week	-.276	.276	-.117	-.999	.319
	Brand Equity (BE) of movie	-.001	.312	-.001	-.005	.996
	Additional Independent Information (Film Critics' Ratings or FCR)	.045	.021	.439	2.167	.031
	Interaction effect: Average Ratings and FCR	-.025	.018	-1.029	-1.403	.162
	Interaction effect: Average Ratings and Popularity	**.203**	**.041**	**1.030**	**5.007**	**.000**
	Interaction effect: Average Ratings, FCR, and Popularity	.001	.001	.402	.564	.573

a. Dependent Variable: **Adoption Rate** (Number of people who have seen the movie in the second week)

Table 2. The interaction effect of additional information (FCR) and product popularity [ab]

Model 2	Variables	Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
(To test **H2 and H2a**)	(Constant)	-21.904	6.844		-3.200	.002
	Popularity (Brand Equity) of movie	2.406	.626	1.230	3.842	.000
	Additional Independent Information (Film Critics' Ratings or FCR)	.315	.115	3.358	2.745	.007
	Interaction effect: FCR and Popularity	**-.030**	**.011**	**-3.424**	**-2.807**	**.006**

a. Dependent Variable: Adoption Intention (Number of people who intended to watch the movie in the second week)

b. Sample includes only those movies which received neutral average-ratings

Table 3. The interaction effect of additional information (FCR) and product popularity [ab]

Model 3	Variables	Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
(To test **H3 and H3a**)	(Constant)	-25.110	6.055		-4.147	.000
	Popularity (Brand Equity) of movie	2.754	.554	1.503	4.970	.000
	Additional Independent Information (Film Critics' Ratings or FCR)	.365	.102	4.154	3.595	.000
	Interaction effect: FCR and Popularity	**-.034**	**.009**	**-4.218**	**-3.661**	**.000**

a. Dependent Variable: Adoption Rate (Number of people who have seen the movie in the second week)

b. Sample includes only those movies which received neutral average-ratings

Figure 1. Plot created using regression results from model 2 (Table 2)

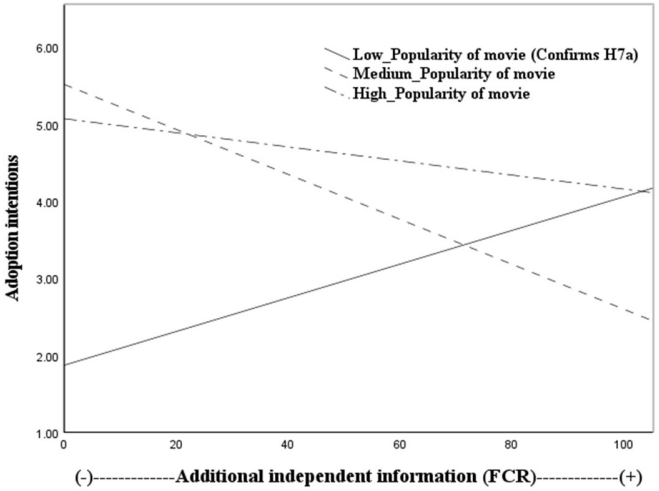

Figure 2 Plot created using regression results from model 2 (Table 2)