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ONLINE RATINGS AND AUDIENCE CHOICE: BASE ON THE EXAMINATION OF TWO STAGE' BOX OFFICE OF CHINESE MOVIES IN NORTH AMERICAN

Abstract:

Online ratings are a key factor that affects the Audience choice and box office after films' opening week. In this paper, box office and online rating data of 115 Chinese films released in North America is selected for a regression analysis, including opening week box office data, subsequent box office data and online rating data from both China and North America. Analysis showed that there exists a positive correlation between online ratings in China and North American. Chinese films with high ratings in China are also well received in North America and opening weekend's online ratings in North America play a key role in increasing the box office in China after the films' opening week in North America. Thus, Chinese films that are selected to enter the North American market should have high online ratings in China and great attention should be paid to online ratings by North American audience.

Keywords:

Audience choice; Online rating scores; Chinese movies; Box office; North American

1. Introduction

In February 17, 2017, *the Great Wall* was released in the North America, brought in more than 18 million dollars during the opening weekend and ranked third. It is a Chinese-US co-production fantasy film directed by Yimou Zhang, starring Matt Damon. In terms of *the Great Wall's* opening weekend box office in North America, it was not too bad and almost flat with *hero*, which is the North American Chinese film's opening weekend box office record holder. But the weekend box office in the sixth week dropped to 95 thousand dollars, while that of *hero* was 1.23 million.

The online ratings of the two films also showed great differences. In the IMDb *the Great Wall* has a rating of 6.1 points far behind *hero's* 7.9 points. On Rotten Tomatoes, *the Great Wall* holds a 35% rating but *hero* has 95%. It is obvious that while box office dropped, its online evaluation also met its Waterloo. In China, although the box office performance is much better than that in North America, the ratings are even worse. Its Douban rating was only 4.9 points.

So, is the Audience choice and North American box office of Chinese movies closely related to their online ratings? Is there an intrinsic link between the movie's ratings in China and that in North America? What is the impact of those ratings on the Audience choice and North American box office?

About the cross cultural box office performance, previous works have investigated the differences between cultures and audiences and looked into factors including box office, award, director, actors, budget, production team, location, themes and etc.(Jordi McKenzie, 2009; Brinja Meiseberg, 2013; Lee, 2006, 2009). Heeyon Kim and Michael Jensen (2014) proposed the Culture Discount and think that cultural differences result in preference differences. However, these studies did not consider whether the word of mouth has a significantly different significant difference in different countries and what the impacts are. Word of mouth is the passing of information between a non-commercial communicator and a receiver concerning a brand, a product, or service(Arndt, 1967). Information cascades about the quality of the movies can change the mind of potential consumers and further influence the sales income (De Vany, Lee, 2001)

With the popularity of the Internet, numbers of film reviews are appearing and spreading on websites and social media. Without the limitations of traditional face-to-face communication, online rating spread more quickly, making it much easier for consumers to exchange information on products, brand or service (Chatterjee, 2001) . The online evaluation of movies refers to the reviews and feedback given by the audiences on the Internet from the perspective of acceptance. It reflects the matching degree between the artistic expression of the movie and expectations of audiences. This kind of information from the audiences' perspective is an important reference for potential viewer to make decisions. In theory, good rated film can cause the viewer to promote the film, thereby increasing the exposure rate and producing more consumer demand. On the contrary, a poorly rated film will dispel the audiences' desire to see it, which does not conducive to film box office growth. However, there is no consistent conclusion about the impact of online rating on movie box office (Basuroy, 2003; Ekaterina, 2011) . Some researchers find that the two are positively related, and good ratings have a significant role in promoting the box office (Wang Xuhui, 2015) . Some found that ratings and box office are negatively correlated (Zhang Yusong,

2009) . Some scholars investigated the relationships between IMDb score of imported films and their box office, and between the North American box office and YAHOO website movie ratings, and found that online ratings have nothing to do with box office (Liu, 2006) . Therefore, the relationship between online ratings and Chinese film box office in North America is worth studying. In addition, the existing literature mainly discusses the influence of movie online ratings on the total box office, unable to explain the differences in different stages of the North American box office of Chinese film. So, is the Audience choice and North American box office of Chinese movies closely related to their online ratings? Be the issue an intrinsic link between the movie's ratings in China and that in North America? What is the impact of those ratings on the Audience choice and North American box office?

Online evaluation is presented in two forms: online review and online rating. Online ratings quantify the audience evaluation of a film more intuitively and are more convenient for data collection and statistical analysis. In this paper, Chinese online ratings and the North American online ratings of Chinese films are expected to analyze the impact of the Chinese online ratings and the North American online ratings on Audience choice. The opening weekend and subsequent North American box office are chosen as indicators of audience Choices. Rating data and box office receipts are gathered from the famous film rating websites from both China and North America including IMDb, Rotten Tomatoes and Douban.

2 Literature Review and Hypotheses

Previous literature has found that the factors that influence audience selection and decision making will be different in a movie's premiere week and the subsequent period. A movie's opening and later-run box office receipts may have different drivers (Basuroy, 2006; Elberse, Eliashberg, 2003). Thus the online evaluation may play different roles across these two time periods. Therefore, this paper puts forward some hypotheses as follows. Here, Chinese films include films made by mainland China, Hongkong or Taiwan companies that invest independently or jointly with foreign companies and get their copyright.

2.1 Online Movie ratings and the subsequent box office

Movie ratings influence both moviegoers' choices and exhibitors' decisions(Ekaterina, 2011). For moviegoers, the quality of a movie is often an important factor for them to make a choice whether it is worth to watch it at a cinema (Suárez-Vázquez, 2011). As with all experience goods, there is an inherent difficulty in evaluating the quality of a movie prior to viewing (Reinstein, Snyder, 2005). Online evaluation acts the role of information providers and product introducers in the process of information dissemination (Park, 2008). Potential consumers can get information about product quality by reading the user's evaluation to eliminate the uncertainty in their purchase process (Bickart, 2001). The user's online evaluation is now an important source of product information for potential consumers. US market research firm - Jupiter Research reported that: 77% of internet users will refer to the product evaluation information posted by other people who have already bought it before they make a purchase decision. These constructs are essential to the

movie industry, where 53% of moviegoers base their movie choices on information received from others (Rosen, 2000). Thus, online evaluation has become an important basis for people to make watching decisions. As for the exhibitors, most movies are released using one of two distinct strategies - "Blockbuster" movies and "Sleeper" movies. The former opens simultaneously in large numbers of theaters and exhibits a steady decline in subsequent weeks. While the latter is initially released in small numbers of theaters and relies on audience evaluations to rearrange (Dellarocas, 2007). A good movie evaluation will give exhibitors a positive message, prompting them to increase the number of screens for that movie, leading to the increase of its succeeding box office.

H1: North America scores have significant positive correlation with subsequent box office.

In general, most wide-release movies will have a dynamic "blockbuster" effect (Dellarocas, 2007) Which means, plenty of movie evaluation information will be created during opening weekend. Higher opening box office is usually associated with more movie evaluation so that the movie can be known broader, which prompts potential consumers to move to cinema to watch the Movie (Wang Xuhui, 2015). Therefore, the opening weekend box office is an important factor affecting the subsequent box office; it may have a positive effect on the subsequent box office.

H2: Opening weekend box office has significant positive correlation with the subsequent box office in North America.

2.2 Online Movie ratings and the opening weekend box office

Under normal circumstances, ratings are available prior to the movie opening only for pre-screened movies (Ekaterina, 2011). Taking account of most Chinese movies released in North America does not have a pre-release there, there are no movie rating scores given by North American before the opening release. Therefore, the understanding of North America score as a driver of opening weekend box office sales is restricted.

H3: North America scores have no correlation with the opening weekend box office

While the North America score is not available, there usually already exist the online movie rating scores given by Chinese movie goers. Because those Chinese movies exported to North America is often released in China before releasing in North America. A large number of online movie reviews and the average movie evaluation score given by Chinese audiences can be found on the Chinese social networking service website Douban movie site or other social software. These online movie evaluations aren't constrained by time and space (Hennig-Thurau, 2012) and can be stored for a long time, and are traceable (Hao Yuanyuan, 2010), so the North American public can scan the information on the internet. Network research made by IResearch in June 2011 shows that 81.8% of audiences will surf on the Internet to get movie-related information. It can be observed that online movie rating scores given by Chinese audiences may influence North American viewers' decision of whether to watch the movie in a cinema.

H4: China scores have significant positive correlation with the opening weekend box office.

The impact of the movie rating scores given by Chinese audiences to the box office will fade after opening weekend because the new score given by the North American is closer to their preference. As the movie consumption is fundamentally the consumption of content, there exists

understanding discrepancy of a story presented by a movie in China and North America due to culture differences (Chen Linxia, 2015), which means, a movie having a hit in domestic may tank in North America while a movie that most Chinese audiences do not appreciate may be popular in North America. Therefore, the preference for a Chinese movie may be different from Chinese audiences to the North American audiences, and the movie score given by Chinese movie goers may not be associate with the movie's subsequent box office in North America.

H5: China score have no correlation with the movies' subsequent box office in North America.

H6: China score have no correlation with North America scores.

The hypotheses of the relationship between variables are shown in Figure 4, where the solid lines indicate that the variables are significantly correlated and the dashed lines indicate that the correlation between the variables is not significant.

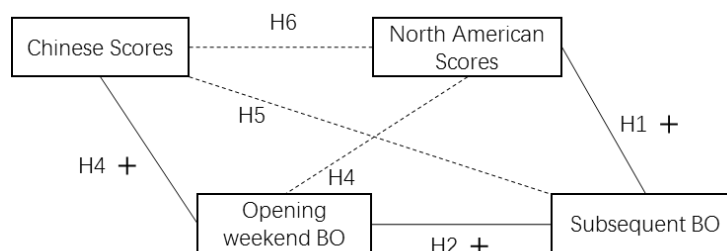


Figure 1 Hypotheses of the relationship between variables

3 An empirical study on the relationship between online rating and Chinese film two-stage box office in North America

3.1 Data Collection

This paper explores the relation between Chinese movies' box office in the North American market and their ratings based on the data mainly collected from Box office mojo, IMDb, ROTTEN TOMATOES, movie.Douban.com, etc. Box office mojo is the most reliable statistic website for North American box office, providing comprehensive data of Chinese movies' box office in the North American market. IMDb is the abbreviation for Internet Movie Database. It is one of the movie rating websites enjoying huge traffic and high user participation. Its ratings are from the audience instead of professional movie critics. ROTTEN TOMATOES is another hub website for movie reviews in North America, and it is the first-choice community for North American movie fans to share comments and discussions. It provides both professional critic reviews and common user ratings. Take the above into consideration, this paper uses the weighted average of IMDb ratings and ROTTEN TOMATOES ratings, because it shows more accurate views of the North American audience towards a movie. Therefore, in order to accurately reflect the rating of the North American audience at a film, the weighted average of its IMDb rating and Rotten Tomatoes rating are calculated as its North American rating. Chinese online ratings are gathered from Douban, the largest film rating website in China. In view of the fact that these two North American mainstream movie review websites were both established in the late 20th century, this paper focuses research on the Chinese movies released in North America during the period from the year 2000 to year 2016. Movies domestic ratings are collected from China's largest

movie reviews website – movies.Douban.com. Deleting the movies with insufficient data, the total number of sample movies for analysis is 115.

3.2 Descriptive Statistical Analysis

From 2001 to 2016, the number of Chinese film released in North America is not large, but it is generally increasing. In recent years, due to the booming film market, box office in China is experiencing a rapid growth in Table 1.

Compared to box office in China, box office of Chinese film in North America is much worse, including both total box office and single box office. From 2001 to 2006, Chinese film total annual box office and single box office reached a high level. In 2003, Medallion grossed \$ 22.22 million. In 2004 hero grossed \$53.71 million and "house of Flying Daggers" grossed \$11.04 million, Kung Fu grossed \$17.11 million in 2005 and "Huo Yuanjia" grossed \$24.63 million in 2006. However then it fell back and stayed at a low level for a long time. While the box office of Chinese films in China and North America has a significant difference, consistency exists between their online ratings. The total box office and the single box office in China are growing, but the average rating showed a downward trend each year since 2010. The box office and online rating in North America also showed a similar pattern (Figure 2).

Table 1 2001–2016 Box office and Online Ratings of Chinese film Released in North America

Year	Sample Number	Box office in China(\$)	Box office in North America(\$)	Average single box office in China(\$)	Average single box office in North America(\$)	Average rating in China	Average rating in North America
2001	4	12629914.25	18808191.00	3157478.56	4702047.75	7.78	7.75
2002	2	802698.41	397372.00	401349.21	198686.00	7.25	7.34
2003	4	37973169.37	23395077.00	9493292.34	5848769.25	6.95	6.84
2004	6	77000000.00	65064649.00	12833333.33	10844108.17	6.88	7.32
2005	2	32222222.22	18553591.00	16111111.11	9276795.50	7.60	7.53
2006	4	96349206.35	32122453.00	24087301.59	8030613.25	5.90	6.88
2007	2	21952380.95	4624274.00	10976190.48	2312137.00	7.60	7.43
2008	6	43177338.84	561369.00	7196223.14	93561.50	7.57	7.11
2009	1	17142857.46	627047.00	17142857.46	627047.00	6.30	7.47
2010	4	316204761.90	680457.00	79051190.48	170114.25	7.35	6.81
2011	12	278319047.62	1428733.00	23193253.97	119061.08	5.84	6.16
2012	13	505752380.95	1659733.00	38904029.30	127671.77	6.65	6.66
2013	17	903028126.98	7625975.00	53119301.59	448586.76	6.28	5.93
2014	9	408920634.92	3163811.00	45435626.10	351534.56	5.79	6.21
2015	12	1103754182.86	6597871.00	91979515.24	549822.58	6.08	6.14
2016	17	1740142919.81	11545387.00	102361348.22	679140.41	6.13	6.29

Source of data: Box office mojo, IMDb, Rotten Tomatoes, Douban and Chinese Film Box Office Website.

Note:¹ North America Rating= (IMDb Rating×number of IMDb Rating + Rotten Tomatoes Rating×number of Rotten Tomatoes Rating) ÷ (number of IMDb Rating+number of Rotten Tomatoes Rating)

² <https://en.wikipedia.org/wiki/IMDb>; https://en.wikipedia.org/wiki/Rotten_Tomatoes.

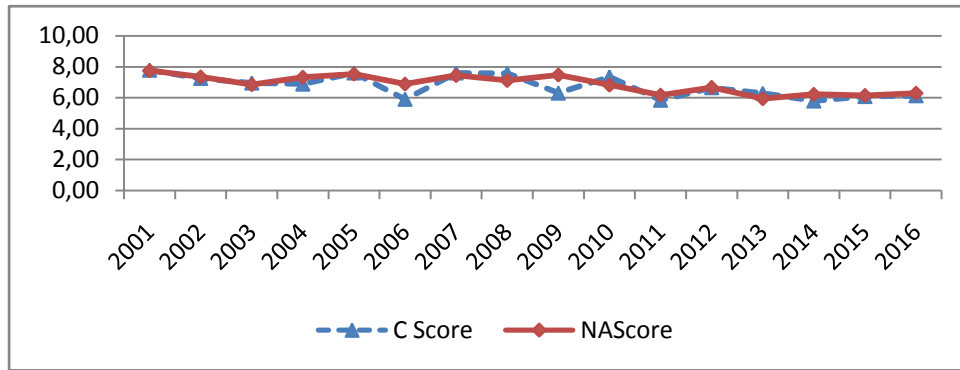


Figure 2. 2001-2016 North America released Chinese film rating comparison

As demonstrated in Table 1 and Table 2, the CScore and NAScore of Chinese movies released in North America are very similar. The standard deviation is relatively small and the averages are both higher than 5, indicating North American audience’s recognition for Chinese movies is close to the Chinese audience, and they generally hold positive attitude towards Chinese movies. As for OWBoxOffice and SBoxOffice, the deviation is huge for different movies.

Table 2 North America released Chinese film rating in China and North America

	N	Min.	Max.	Avg.	Std. Deviation
<i>CScore</i>	115	3.4	9	6.466	1.2154
<i>NAScore</i>	115	3.14	8.83	6.526	0.9143
<i>OWBoxOffice</i>	115	361	18004319	464664.04	2120530.38
<i>SBoxOffice</i>	115	291	127415667	2336498.56	12466020.69
Effective N (listwise)	115				

3.3 Analysis of Correlations among Variables

Because of the difference in unit and magnitude, rating score and box office do not show a direct linear relation. Therefore, this paper has applied log transformation to *NAScore* (North American movie rating score), *CScore* (Chinese movie rating score), *OWBoxOffice* (Opening Weekend Box Office), and *SBoxOffice* (Subsequent box office after opening weekend). On one hand, this transformation better accommodates parameter estimation by reducing the instability due to the difference in the magnitude and changing non-linear relations among variables into linear relations. On the other hand, it removes the heteroscedasticity and makes the regression results more accurate. Involved variables and their respective meanings are given in Table 3 as below.

Table 3 Descriptions of variables

Variables	Descriptions
Ln <i>NAScore</i>	North American movie rating score (Natural Log-transformed)
Ln <i>CScore</i>	Chinese movie rating score (Natural Log-transformed)
Ln <i>OWBoxOffice</i>	Opening weekend box office
Ln <i>SBoxOffice</i>	Subsequent box office after opening weekend

The correlation analysis aims to test whether there are correlations among variables and to measure the strength of such correlations. This paper applies Pearson correlation two-tailed test to

the variables involved.

Table 4 Relationships among variables

		Ln <i>CScore</i>	Ln <i>NAScore</i>	Ln <i>OWBoxOffice</i>	Ln <i>SBoxOffice</i>
Ln <i>CScore</i>	Pearson Correlation	1	.768**	-.084	.184*
	Significance (2-tailed)		.000	.367	.048
	N	115	115	115	115
Ln <i>NAScore</i>	Pearson Correlation	.768**	1	.103	.356**
	Significance (2-tailed)	.000		.269	.000
	N	115	115	115	115
Ln <i>OWBoxOffice</i>	Pearson Correlation	-.084	.103	1	.851**
	Significance (2-tailed)	.367	.269		.000
	N	115	115	115	115
Ln <i>SBoxOffice</i>	Pearson Correlation	.184*	.356**	.851**	1
	Significance (2-tailed)	.048	.000	.000	
	N	115	115	115	115

** . Significance at 1 % level.

* . Significance at 5% level.

Table 4 shows that Chinese movies' *OWBoxOffice* in North America does not possess significant correlation with their *NAScore*. This means that in the initial period after release, during which *NAScore* is yet to massively generate, box office tends to be influenced by other factors. The correlation test also shows that Chinese movies' *OWBoxOffice* in North America does not possess significant correlation with their *CScore*. This means North American audience's choice of movies is not influenced by the *CScore* of the movies, despite the fact that there are already massive online reviews from Chinese audience appeared before the Chinese movies' release in North America. There are two possible reasons. First, movies' Chinese rating information does not effectively reach potential audience in North America. The information of the movies' evaluation is mainly posted on Chinese websites and is communicated through Chinese social media such as Weibo, WeChat, etc., whereas their audience is the potential viewers in North America who get access to information mainly through mainstream North American media and social websites. Second, during the opening week of Chinese movies' release in North America, *CScore* may not be significantly considered when North American audience making choice of which movies to watch. By further discovering from the table above, Chinese movies' *SBoxOffice* in North America correlates respectively with their *CScore*, *NAScore*, and *OWBoxOffice* at the 0.01 significant levels, meanwhile the movies' *NAScore* significantly correlates with their *CScore*. The results of the hypotheses are presented in Table 5 as follows.

Table 5 Results of hypotheses

Hypothesis	Result
H1: <i>NAScore</i> significantly correlates with <i>SBoxOffice</i>	True
H2: <i>OWBoxOffice</i> significantly correlates with <i>SBoxOffice</i>	True
H3: Correlation between <i>NAScore</i> and <i>OWBoxOffice</i> is not significant	True
H4: <i>CScore</i> significantly correlates with <i>OWBoxOffice</i>	False
H5: Correlation between <i>CScore</i> and <i>SBoxOffice</i> is not significant	False

H6: Correlation between *CScore* and *NAScore* is not significant

False

3.4 Regression Analysis

Based on the above analysis, in order to measure the degree of influence of *CScore* and *NAScore* on *SBoxOffice*, this paper establishes a regression model to conduct further research. In the model: Ln *NAScore* represents North American Score, Ln *CScore* represents Chinese Score, Ln *OWBoxOffice* represents Opening Weekend Box Office, and Ln *SBoxOffice* represents Subsequent Box Office. Subscript $i=1, 2, \dots, N$ represents movie samples. $\alpha_0, \beta_0, \gamma_0, \delta_0$ are all constant terms. $\alpha_1, \beta_1, \gamma_1, \gamma_2, \delta_1, \delta_2$ are the coefficients of variables. According to the correlation analysis result, Chinese movies' *NAScore* has high positive correlation with their *CScore*, and it is possible that multicollinearity exists among variables. Therefore, Regression Model I uses *CScore* as the explanatory variable of *NAScore*.

$$NAScore_i = \alpha_0 + \alpha_1 CScore_i \quad (1)$$

As showed in Table 6, the adjusted R^2 of model 1 is 0.607, namely *CScore* explains 60% of *NAScore*'s variance, indicating a high goodness of fit of the model. It demonstrates that the evaluations of North American and Chinese audience are similar for Chinese movies released in North America. This is in conformity with the result of the above descriptive statistical analysis. Because *CScore* and *NAScore* have multicollinearity, these two cannot be the explanatory variables for *SBoxOffice* at the same time. Therefore, this paper first establishes Regression Model II for *SBoxOffice* and *OWBoxOffice*, then add *NAScore* and *CScore* subsequently as explanatory variables to establish Regression Model III and Regression Model IV with *SBoxOffice*, in order to compare the influential power of *NAScore* and *CScore* on *SBoxOffice*.

$$\text{Ln } SBoxoffice_i = \beta_0 + \beta_1 \text{Ln } OWBoxoffice_i \quad (2)$$

$$\text{Ln } SBoxoffice_i = \gamma_0 + \gamma_1 \text{Ln } OWBoxoffice_i + \gamma_2 \text{Ln } NAScore_i \quad (3)$$

$$\text{Ln } SBoxoffice_i = \delta_0 + \delta_1 \text{Ln } OWBoxoffice_i + \delta_2 \text{Ln } CScore_i \quad (4)$$

Regression results shows that Regression Model III, after the addition of *NAScore* as explanatory variable based on Regression Model II, the overall goodness of fit of the model increased by 7 percentage point, meaning that the addition of *NAScore* as explanatory variable has significantly increased the explanatory power of the model for the variance of *SBoxOffice*. *OWBoxOffice* and *NAScore* have combinedly explained around 80% of the variance of *SBoxOffice*, meaning that *NAScore* is one of the key factors to influence Chinese movies' *SBoxOffice*. On the contrary, Regression Model IV, in which *CScore* substitutes *NAScore*, has less goodness of fit than Regression Model III, meaning that *NAScore* has stronger explanatory power than *CScore* for the variance of Chinese movies' *SBoxOffice*. This result also consists of practical experience. Further observation discovers that the standardized coefficient of Regression Model III is less than Regression Model II, meaning that the addition of *NAScore* as an explanatory variable has weakened the influential power of *OWBoxOffice* on *SBoxOffice* by a certain degree.

Table 6 Results of regression

Model	Explained Variables	Explanatory Variables	Std. Coefficients	N	F	Adjusted R^2
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I	<i>NAScore</i>	<i>CScore</i>	.781**	115	178.5**	.607
II	<i>SBoxOffice</i>	<i>OWBoxOffice</i>	.851**	115	298.4**	.721
III	<i>SBoxOffice</i>	<i>OWBoxOffice</i>	.832**	115	220.3**	.792
		<i>NAScore</i>	.270**			
IV	<i>SBoxOffice</i>	<i>OWBoxOffice</i>	.872**	115	212.1**	.786
		<i>CScore</i>	.258**			

** . Significance at 1 % level.

4 Conclusion and suggestion

In this paper, the impacts of Chinese online ratings and North American online ratings of Chinese film North American box office are analyzed. Although the box office of Chinese films in North America are obviously lower than the box office in China, which proves that cultural discount proposed by Heeyon, Kim, Michael, Jensen (2014) and Lee (2008) exists, empirical research reveals that the online ratings of Chinese movies in North America are similar to that in China. In other words, if a Chinese film has a high rating in China; it is likely to get a high rating in North America too, and vice versa. It shows that although the number of people that watches or appreciates Chinese film would be less in China than in North America, Chinese audiences and North American audiences have some common views, that is to say, consistency exists. Also, online ratings in both China and North America are positively correlated with the box office after the opening weekend and are not correlated with the opening weekend box office. Meanwhile, the North American online ratings are more correlated with subsequent box office than the Chinese online rating, which mean high North American ratings are a key driver of box office growth in China after the film' opening weekend in North America.

The online rating is a general judgment given by the audiences based on the viewing experience and the overall sense of the film director, actor, music, plot, special effects, etc.. Therefore, North America market distributors from China should pay heed to the film's North American online ratings. For films with positive reviews and a high rating in North America after opening weekend, their distributors should increase the number of showings of a film, which can help obtaining greater growth in the subsequent box office. For the issuers, film with high online rating in China should be considered first when exporting films to the North America. Online ratings of Chinese film in China and North America have a high consistency. Therefore, high rating films in China are also easier for North American audiences to understand. For Chinese film producers, they should focus on the content and the cultural logic of the film, although there is some film with both low rating and high box office in recent years. The high box office of these films is just a marketing success. The story itself is weak and will not only cause the audiences' disappointment, but also go against the cross cultural communication of movies. After all, the film is content consumption. Film that neglect artistic considerations and innovations can only create ephemeral beauty. Instead of focusing solely on the domestic market, Chinese films should take a broader view of the overseas market. In the global context, content production is important and only a film constructed from a national culture and logic is a work of art appreciated all over the world. As an essential carrier of Chinese culture, Chinese movies can help the Chinese culture to spread around the world only when they have reasonable cultural logic and strong artistic tension.

This paper only studies the relationship of online ratings and the Chinese film box office in North America. Further research is still needed to analyze the relationship between online reviews on Chinese film and box office in North America, and the impact of reviews from professional

critics and ordinary users on the box office.

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