Information Characteristics on Instagram and Viewer Behavior

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Abstract. Image-based social media such as Instagram is actively used as a tourism marketing channel that provides information regarding tourist destinations. Recognizing the importance of viewers' responses, this study investigated the relationship between viewers' responsive behavior and the characteristics of texts and images posted on Instagram. The results of multiple regression analysis showed that certain emotional expressions in hashtags and images that include people are positively associated with the number of likes and comments. This study provides insights into social media utilization strategies and post-marketing strategies that are helpful for DMO (Destination Marketing Organization).

Keywords: Customer behavior · Information characteristics · Social media · Instagram · DMO

1 Introduction

The growth and importance of smart tourism has been facilitated by the development of social media [1]. Social media is often used as a marketing tool that provides information and formulates a positive attitude about destinations [2]. As the visual image is a powerful tool that leads tourists' behavior [3], Instagram, which allows users to upload and share images with short texts and captions, has emerged as an actively used platform [4] in tourism. The texts and images in the post in turn affect viewers' responsive behavior. Despite the increasing importance of social media and Instagram, to the best of our knowledge few studies have explored the characteristics of texts and images, which elicit viewers' responsive behavior [5].

Prior studies mainly explored the marketing effect of the text reviews or the images. Investigating both texts and images simultaneously, this study aims to explore how the characteristics of visual and verbal information are related to viewers' responsive behaviors, using the Korea Tourism Organization (KTO)'s English Instagram account. Academically, this study expands the scope of understanding social media posts by adopting dual-coding theory [6]. This study also provides additional insights into social media marketing strategy and post-appeal-evaluation guidelines that are helpful in marketing.

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2 Literature Review

Consumers’ decision-making on experience goods and services such as tourism is greatly influenced by online contents on social media [7]. Social media users exchange and share useful information through texts and images [8]. Specifically, Instagram, which is an image-oriented platform [9], allows users to search for images more easily through hashtags. Hashtags also facilitate users to recommend specific posts to others with common interests [9]. Dual-coding theory postulates that visual and verbal information are processed differently [6]. Thus, this study identifies characteristics of Instagram information by texts (emotional expressions in the posts and the number of hashtags) and images (whether the image contains people or not).

Viewer behavior in social media has been categorized into consuming, contributing, and creating [10]. Through content-consumer interactions on Instagram, viewers receive sensory stimulation and in response they may engage in contributing reactions to the post; commenting or clicking on likes, for example. Prior studies examined the antecedents of reactive behavior on social media. Casalo et al. [11] found that consumers’ interaction intentions positively affect the number of likes and comments. This study examines how consumers’ reactive behavior, measured by the number of likes and comments on Instagram posts, varies according to the characteristics of texts, tags, and images of the posts that provide tourism information.

3 Research Model and Hypothetical Development

Fig. 1. Research framework

Figure 1 presents the research framework. Using dual-coding theory [6], information on Instagram was examined by two types—cognitive (texts) and affective (images). It has been reported that emotional expressions on social media posts affect viewers’ behavioral reactions [12]. Thus, we examined the intensity of four emotions, namely, anticipation, joy, surprise, and trust from the text information. Since the account is operated by the national tourism organization, only positive emotions were considered. The characteristics of the text are expected to be associated with viewers’ behavioral

responses measured by the number of likes and comments. Thus, we propose the following hypotheses:

H1-H2: Characteristics of cognitive information (Text) is positively associated with the number of Likes/Comments.

H1a~H1d/H2a~H2d: The number of anticipation-, joy-, surprise-, and trust-related words are positively associated with the number of Likes/Comments.

As for the images in the tourism context, the feeling of presence is likely to affect the behavioral intention. Photos with people were found to make viewers feel more present in the featured location [13]. Thus, in this current research, images were categorized by whether the photos contain people or not (images only contain scenery or objects without people). Thus, we hypothesize as follows:

H3-H4: Characteristics of affective information (Image) is positively associated with the number of Likes/Comments.

H3a-H3b/ H4a-H4b: Images with/without people are positively associated with the number of Likes/Comments.

With hashtags, people can search and collect posts more easily. So, the more hashtags, the higher potential to bring users, which result in a higher likelihood of active reactions. These premises can be hypothesized as:

H5a-H5b: The number of hashtags is positively associated with the number of Likes/Comments.

Further, when hashtags used with text and image can call more active responses. Appropriate hashtags will reinforce contents to reach additional users and thereby invite more likes and comments [14]. Therefore, we hypothesize as below:

H6a~H6d: Hashtags moderate the relationship between the characteristics of cognitive/affective information and the number of Likes/Comments.

4 Research Methodology

4.1 Data

Data were obtained from KTO's English Instagram account, which contains more than 800 posts with 310,000 followers as of August 2020. We collected likes, comments, and hashtags from 753 posts posted from 1st November 2017 through 31st July 2020. Table 1 shows the description of data. Images were categorized into 2 groups: photos with people and without people based on elements included in Chrome Developer tool.

Table 1. Description of data

Variables	Description	Obs.	Avg.	Std.	min	max
Text	Number of emotional words in the caption	3,016	4.01	3.49	0	23
Image	Photos without people = 0	489 (64.9%)	0.35	0.48	0	1
	Photos with people = 1	264 (35.1%)				
	Total	753 (100%)				
Hashtag	Number of hashtags	4,927	6.54	1.11	1	12
Like	Number of likes	9,312,964	12,367.46	18,226.40	682	221,169
Comment	Number of comments	46,894	62.28	70.29	3	965

4.2 Methodology

Multiple regression analysis was used to verify the hypothesized relationships. The number of likes and comments were converted to the log scale. For the text characteristics, the number of words related to positive emotions (*Anticipation*, *Joy*, *Surprise*, and *Trust*) was identified by sentiment analysis using the NRC (National Research Council Canada) emotion lexicon. We estimate the following equation:

Viewer response = $\beta_0 + \beta_1 \text{Text_Char} + \beta_2 \text{Image_Char} + \beta_3 \text{Hashtag} + \beta_4 \text{Text_Char} \times \text{Hashtag} + \beta_5 \text{Image_Char} \times \text{Hashtag} + \varepsilon$, where Viewer Response is *Like* and *Comment*; Text_Char is a vector of *Anticipation*, *Joy*, *Surprise*, and *Trust*; Image_Char is a dummy variable of *Image*; and ε is an error term. All the explanatory variables were mean-centered. VIF (variance inflation factor) confirmed no issue of multicollinearity.

4.3 Results

Table 2 shows the results of analysis. Interestingly, emotional expressions in texts were not associated with *Like* (H1a-H1d), while *Anticipation* and *Joy* (H2a and H2b) were significant for *Comment*. *Image* and *Hashtag* indicated a significant relationship with *Like* and *Comment* (H3, H4, H6a, and H6b). As to H3 and H4, photo without people gathered more *Like* and *Comment*. While there was no moderating effect of *Hashtag* on the relationship between text characteristics and behavioral reactions (H5a and H5b), negative moderating effects were found on the relationship between *Image* and behavioral reactions (*Like* and *Comment*) (H5c and H5d).

Table 2. Results of analysis

Dependent variable: <i>Like</i>				Dependent variable: <i>Comment</i>			
	Coefficient	Std. error	t-value		Coefficient	Std. error	t-value
Text_Char				Text_Char			
Anticipation (H1a)	−0.024	0.017	−1.432	Anticipation (H2a)	−0.030	0.014	−2.122**
Joy (H1b)	0.025	0.016	1.504	Joy (H2b)	0.027	0.014	1.980**
Trust (H1c)	0.015	0.022	0.664	Trust (H2c)	0.022	0.019	1.195
Surprise (H1d)	−0.028	0.019	−1.449	Surprise (H2d)	−0.013	0.016	−0.793
Image (H3)	0.118	0.031	3.791***	Image (H4)	0.068	0.026	2.598***
Hashtag × Image (H5c)	−0.112	0.030	−3.721***	Hashtag × Image (H5d)	−0.130	0.025	−5.205***
Hashtag (H6a)	0.111	0.014	8.174***	Hashtag (H6b)	0.092	0.011	8.028**

***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

5 Conclusion

This study examined the relationship between the information characteristics and viewers’ behavioral responses considering visual (cognitive) and text (affective) information. The emotional expressions in *Text* were not associated with *Like*. While neither *Trust* nor *Surprise* are associated with *Like* and *Comment*, *Anticipation* and *Joy* were positively associated with *Comment*. As to *Image*, photos without people indicated stronger association with viewer responses. Concerning *Hashtag*, negative moderating effect was found on the relationship between *Image* and responsive behavior. Too many hashtags may drive the users to be confused. Future research may validate this point utilizing Geotags as well. This study expands the scope of understanding of the viewers’ behavior on social media using Instagram. We provide useful and strategic social media management guidelines for both destination marketers and uploaders.

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