

Examining the effect of information disclosure on website stickiness: The cognitive information perspective 從資訊認知觀點探討資訊揭露對網站黏著度的影響

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Abstract: This study employs the concept of cognitive information processing (CIP) to examine the causal relationships among information disclosure, cognitive information effect, and website stickiness. Considering their interests, consumers may become “sticky” to a specific website after recognition of some exposed information. We thus look to examine the cognitive information effect, i.e. information scent and message framing, in consumers’ processing of their perceived information. The findings from an empirical investigation demonstrate that sponsorship disclosure significantly affects the information scent, which mainly positively impact the website stickiness. Moreover, sponsorship disclosure positively influences message framing, which then positively affects website stickiness. Our findings indicate that sponsorship disclosure plays a main role in forming website stickiness. This research marks a new ground in the sponsorship disclosure and endorsement disclosure literature and thus provides a useful profile in the field of on-line marketing. Marketing managers can hence use appropriate information disclosure to attract and stick consumers to a site by way of information scent and message framing.

Keywords: Information disclosure, message framing, information scent, stickiness, e-WOM.

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摘要：本研究運用資訊認知過程概念，檢視資訊揭露、資訊認知效果和網站黏著度之間的因果關係。考慮到消費者的興趣，消費者在認知到若干揭露的資訊之後，可能會對特定網站產生黏著。因此，本文藉由資訊嗅覺和訊息框架等資訊認知效果，檢視在消費者處理他們資訊認知的反應結果。實證結果顯示，贊助者揭露對資訊嗅覺有顯著影響，資訊嗅覺對網站黏著度也有正向顯著影響。此外，贊助者揭露對訊息框架有正向影響，進而對網站黏著度也有正向顯著影響。此研究結果顯示，贊助者揭露在網站黏著度的形成過程中具有主要的作用。本研究是贊助者揭露和名人代言文獻的一個新領域研究，有助於提供網路行銷領域相關的應用。因此，行銷經理可以使用適當的資訊揭露，透過資訊嗅覺和訊息框架的方式，吸引和黏著消費者到特定網站中。

關鍵字：資訊揭露、訊息框架、資訊嗅覺、黏著度、e化口碑

1. Introduction

The stickiness of customers to continuous visiting is a critical focus for website managers when conducting marketing on the Internet (Chou and Chen, 2016). Stickiness is also the key to attracting consumers and important for many industries (Hwang and Jeong, 2016), and it could be increased through interactive and vivid content that encourages consumers to revisit and spend a longer period of time on the website (Lin, 2007). In this information era, customers are always searching and reviewing related information in order to make suitable decisions and exhibit rational behavior (Cheng, Chien, and Woodburne, 2017; Ho and Bodoff, 2014). Moreover, stickiness is the process of converting information into action (Kurstedt, 1987), and converting decisions into an action is the necessary result from using information.

Information is encoded by consumers to give meaning and can be compared with their own interests. After the information is collected and decisions are made, consumers start to take action. Interactions among groups and information systems produce specific symbolic meanings that satisfy self-valued performance (Hsu *et al.*, 2013). Thus, information is the foundation and starting point of consumption behavior, with appropriate information being a precondition for effective decision making and action. This study thus uses the concept of information processing theory, which reduces uncertainty in consumers'

decision-making behavior, to explore the cognitive information effect on their website stickiness.

Users have a higher sticky intention with a message when they encounter an interesting message (Gibson *et al.*, 2016). Information disclosure is a managerial tool of Internet marketing, and endorsement and sponsorship disclosure are clear signals from a website trying to build social ties based on the signal mechanism. This can lead to consumers' trust in the sponsorship and follow-up behaviors (Mudambi and Schuff, 2010). These signals are traits that have evolved specifically, because they can change the behavior of consumers in ways that benefit the signal provider. Marketers use the mechanism of signaling to disclose details of schedules and to give the latest authorization, which have been shown to be more effective and efficient in innovative website development (Moody and Galletta, 2015).

The relationships among information scent, messaging framing, and stickiness are also a significant issue for online shopping platforms, especially as the popularity of the Internet has grown dramatically (Moody and Galletta, 2015). Numerous research studies have discussed sponsorship, but there are limited studies exploring the relationship between information disclosure and cognitive information cues of websites during the process of cognitive information processing (CIP) (Boerman *et al.*, 2017). Surveys regarding the effects of message framing and information scent on website stickiness are also rare and form the research gap this study is targeting to fill. Consequently, we shall examine the causal relationships among information disclosure, the cognitive information effect of cues, and website stickiness.

2. Literature review and development of hypotheses

The concept of information processing is based on the idea that humans process the information they receive, rather than merely responding to stimuli. Pfeffer (1981) provided a particularly clear summary of this. First, the individual's environment may provide cues as to which dimensions might be used to characterize the work environment. Second, the environment may provide information concerning how the individual should weigh the various dimensions - whether autonomy is more important than variety of skill, whether pay is more or

less important than usefulness or worth, etc. Third, the context provides cues concerning how others have come to evaluate the work environment on each of the selected dimensions. Fourth, it is possible that the context provides a direct evaluation of the work setting along with positive or negative dimensions, leaving it to the individual to construct a rationale to make sense of the generally shared affective reactions. In this study, a website is the environment that provides consumers information for their decision making behaviour. Websites need to disclose relevant information that consumers can use to diagnose the necessary unmet demand of suggestive details.

Based on CIP, endorsement and sponsorship disclosure may be used by customers to reach the website of their interests. Endorsement disclosure is defined as any individual who uses public recognition on behalf of a product by appearing with it in an advertisement (McCracken, 1989). The visual information is transformed as a series of processing stages in the individual memory systems. To equate endorsers' good appearance with the image of the products, advertisers use endorsers to shape the brand image of products, especially when there lacks any product image definition (Walker *et al.*, 1992).

Sponsorship disclosure is a notification that indicates that the content was sponsored, so that consumers recognize the persuasive intent of the content from the CIP concept (Boerman *et al.*, 2012; 2014b; 2017). Sponsorship disclosure is also a cue that consumers use to determine whether or not a product is worthwhile, according to the information diagnosis mechanism (Ohanian, 1991). This content attracts consumer attention and can then serve as helpful information for evaluating the usefulness of the sources.

Information scent refers to a seeker's evaluation of proximal and informational cues such as website links and other navigational aids to assess the relative likelihood of finding valuable and potentially desired information on other pages of the website (Rajala and Hantula, 2000). The information processing progression is assumed to be cognitive and learned. Information scent refers to a consumer's evaluation of proximal, imperfect, and informational cues to assess the relative likelihood of finding valuable and potentially desired information located on other pages within the website (Rajala and Hantula, 2000). The consumer assesses the "scent" provided by the website's text and determines whether the information leads to desired content. Thus, information scent reduces

the cost of information retrieval by indicating whether browsing a given area of the website, continuing to a new area, or moving to a different website is desirable (Moody and Galletta, 2015).

Message framing is the way in which CIP is presented (Chong and Druckman, 2007), of which there are two types. In the first type, the message conveys the benefits of using the product while emphasizing the opportunity cost of not using the product (Overton, 2018). In the second type of message framing, positive messages are connected with the positive attributes of the product or claim and negative messages with consumers' low trust and their nature of advertisement (Meyers-Levy and Maheswaran, 2004). Sponsorship disclosure and endorsement can influence the reaction of the audience given the information diagnosis mechanism within the CIP concept (Boyd and Ellison, 2008). Since information diagnosis occurs between providers and consumers, providers need to disclose credible information that consumers can use to judge the potential benefits and opportunities of suggested projects (Boerman *et al.*, 2017).

Website stickiness is the ability of a website to gain continuous consumers by attracting passersby to stop and then continue to use the website and is deemed as the loyalty to the website (Lin, 2007). Amusing and interactive content positively affect a consumer's attitude towards social networking sites, especially when information scent and message framing suggest usefulness, thus forming a stickiness intention to remain involved (Wu, 2011).

Electronic word-of-mouth (e-WOM) is defined as any positive or negative statement made by potential, actual, or former customers about a product or company, which is made available to a multitude of people and institutions via the Internet (Henning-Thurau *et al.*, 2004). Before the advent of information technology, e-WOM meant consumers spreading their experience among friends and relatives via online media (Viglia, Minazzi, and Buhalis, 2016). E-WOM has an impact on customer attitudes and consequently on booking/purchase intentions (Parket *et al.*, 2007). Therefore, e-WOM is the critical factor that website managers want to keep for further marketing.

It is important to recognize cognitive information that influences stickiness so that marketing managers can maximize the volume of information scent and message framing (Mudambi and Schuff, 2010). Individuals use the endorsement and sponsorship disclosures to evaluate the information by attribution or labeling

within CIP. The learning process must be directed toward the achievement of common goals (Chen, Huang, and Wey, 2017). Attribution and labeling are closely related to social construction and symbolic interaction analysis in the cognitive learning process. Using attribution and labeling, an information seeker locates cognitive information more efficiently, rather than committing substantial cognitive resources to determine whether to continue searching in a given location that may or may not contain the desired information (Moody and Galletta, 2015). They then involve the application mechanism of the CIP effect of website cues. Our research is based on the study of Rothman (2005) and Gibson *et al.* (2016) and employs the CIP concept further by providing practical applications for better marketing. The cognitive information effects, such as information scent and message frames, on the website are included in cognitive communication. Figure 1 illustrates the research framework of this study.

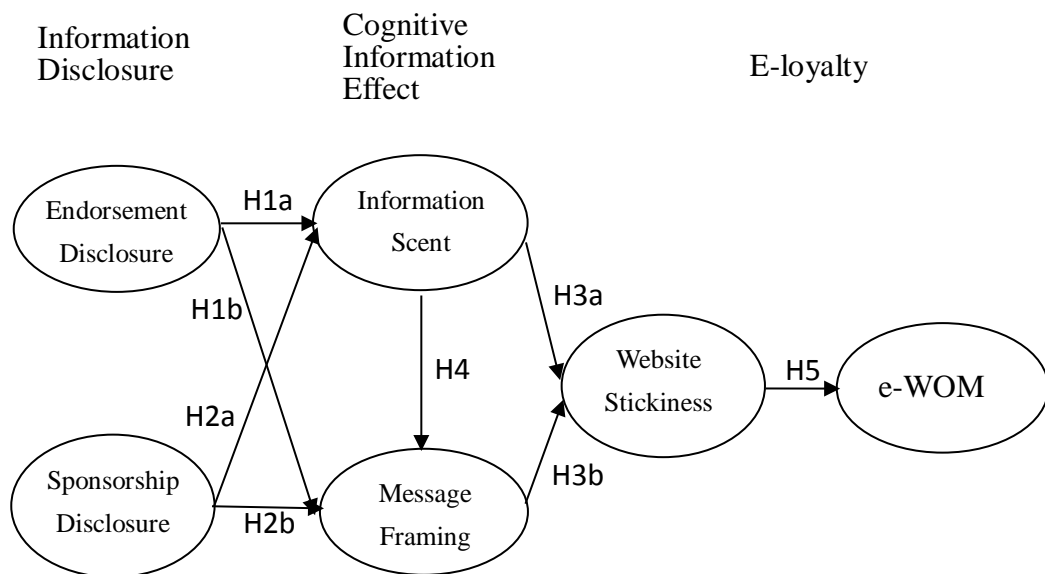


Figure 1
Research framework

2.1 Effect of endorsement disclosure on information scent and message framing

Via social learning from the CIP concept (Mudambi and Schuff, 2010), endorsements create a distinctive personality for a brand, powerfully creating a positive image that consumers could imitate. When people have strong social ties, the information to him allow a large number of people to have access to this message (Keng, Chen, and Huang, 2018). Through endorsements, marketers provide social ties via official media certified by third parties, and consumers use these social ties to enhance interactions. Endorsements reduce the cost of information retrieval and determine whether a consumer will search for information with similar scents to the endorsement (Moody and Galletta, 2015). Celebrity endorsement disclosure offers positive attributes of the product or claims a connection through positive messages. Thus, the consumer will transfer his good impression of the celebrity to the product being endorsed if the consumer is the fan of the celebrity and has a good impression of the celebrity (Meyers-Levy and Maheswaran, 2004). Through the halo effect, the endorsement can be deemed as an information scent to guide consumers' attention to the advertisement, arouse their interest, and pique their desire. Thus, we propose the following hypothesis.

H1a: Endorsement disclosure positively influences information scent.

Celebrity endorsement disclosure can provide a brand image cue to attract consumers' attention in order to form resonance and promote a subsequent purchase. Given that the image principle is used, the brand image cue from celebrity endorsement disclosure can deduce or maintain the product evaluation (Kamins *et al.*, 1989). Thus, when brand image is high, its overall evaluation is high. This will form positive message framing and also make the perception of quality high as well (Dodds *et al.*, 1991). Endorsement disclosure may propose a connection between consumers' low trust and low preference, since consumers will deem celebrity endorsement as another type of advertisement and form negative message framing based on the information diagnosis mechanism (Chong and Druckman, 2007; Ohanian, 1991). Thus, we propose the following hypothesis.

H1b: Endorsement disclosure positively influences message framing.

2.2 Effect of sponsorship disclosure on information scent and message framing

Sponsorship disclosure provides an information cue to help consumers find a linkage of positive branding, i.e., a type of information scent (Kerne and Smith, 2004; Stipp and Schiavone, 1996). Sponsorship cues influence consumers who depend on the attention to both the information source and the information itself (Boerman *et al.*, 2017). The high reputation of a sponsor draws consumers' attention. Consumers recognize sponsorship as a link to products, and this phenomenon renders the effect of information scent (Boerman *et al.*, 2012). Therefore, sponsorship disclosure is an easy way to raise brand reputation and has a real effect on the endorser. Thus, we propose the following hypothesis.

H2a: Sponsorship disclosure positively influences information scent.

Even while consumers may prejudge sponsorship as the nature of an advertisement to form negative message framing, sponsorship disclosure can propose a connection between consumers' trust and preference (Meyers-Levy and Maheswaran, 2004). Reading an advertisement without disclosure of sponsorship is equivalent to online reviews without origin. Not knowing the source of the information, consumers lose the option to willingly accept sponsorship information, and sponsors lose their ability to invite consumers through the content (Nelson *et al.*, 2009). In other words, companies utilize sponsorship activities to increase the visibility of their products and services and thereby their sales and profitability (Sandler and Shani, 1993). This will affect consumers' cognition when they have a positive evaluation of message framing. Since it provides a quality assurance from the sponsorship of a famous company, sponsorship disclosure can promote products' positive attributes or claim a connection via positive messages (Overton, 2018). Thus, we propose the following hypothesis.

H2b: Sponsorship disclosure positively influences message framing.

2.3 Effect of information scent and message framing on website stickiness

The development of information scent requires both collecting timely information about what consumers find important and constantly testing

assumptions of their expectations (Spool *et al.*, 2004). Along with the self-concept theory, consumers must find cues that are consistent with their self-concept, e.g. self-image, to reach their self-persuasion (Johar and Sirgy, 1991). The more advertising messages are in line with the self-concept of consumers, the stronger the persuasion becomes. Website stickiness with a given unit of information could be measured as the incremental expenditure required to transfer that unit of information to a specified locus in a form usable by a given information seeker (Wu, 2011). When this expenditure is low, stickiness is low; when it is high, stickiness is high. Under self-persuasion, the consumer enters a continuous state of stickiness (Kwon and Sung, 2012). Consumers expect to buy products when the perception of informed products is consistent with their expectations, and when product perception is inconsistent with their expectations, it leads to a low level of consumers' interest (Churchill and Surprenant, 1982). Therefore, we propose the following hypothesis.

H3a: Information scent positively influences stickiness.

Message framing is the way in which CIP is presented. Along with the cognitive response theory, when consumers receive the trait of a message, they evaluate the message and react appropriately (Greenwald, 1968). Consumers always prefer attractive things, and hence the attractiveness of a product affects its persuasion. The impact of attractiveness on consumers' attitudes comes through consumers' meaning and recognition to identify the attractiveness of the source (Overton, 2018). Under message framing, the usefulness and interaction of information have a positive impact on consumers' attitude towards social networking sites, thus forming a stickiness intention to remain as a participant (Wu, 2011). Thus, we propose the following hypothesis.

H3b: Message framing positively influences stickiness.

2.4 Effect of information scent on message framing

Recreating the linkage of information scent increases message framing (Nisbet, 2009). Once consumers detect useful information and choose further actions, they then decipher whether the information is positive or negative and judge its benefits and opportunities. As soon as consumers recognize their own needs and motivate themselves to feel the necessity to take actions, they consider this message framing as a resultant message and render a positive attitude

(Boerman *et al.*, 2014a). When exposed to an information scent, consumers' interpretation naturally connects their concept between their heart and the frame of things discourse, and they then become the message constructor (Moody and Galletta, 2015). Message framing is effective as a consequence of information scent. Thus, we propose the following hypothesis.

H4: Information scent positively influences message framing.

2.5 Effect of website stickiness on electronic word-of-mouth (e-WOM)

Stickiness is the ability to keep consumers engaged in community activities repeatedly for long periods of time (Zott *et al.*, 2000). If a community has a high degree of stickiness, then consumers in that community are loyal to it (Holland and Baker, 2001). Loyal consumers share their satisfaction in the community with their relatives and friends and recommend the community to others on the Internet (Weisfeld-Spolter, 2014). Thus, we propose the following hypothesis.

H5: Website stickiness positively influences e-WOM.

3. Research method

This study employed a questionnaire with a 6-point Likert scale, including endorsement, sponsorship disclosure, information scent, message framing, and e-WOM. Endorsement has three categories: Attractiveness, self-expression, and relevance to life (McIntyre and Pigram, 1992). Sponsorship disclosure has three categories: Persuasion knowledge, timing, and duration (Boerman *et al.*, 2014a). Information scent has two categories: inferring the consumer's need and stimulating consumer action (Gibson *et al.*, 2016). Message framing has four categories: The positive and negative of the message itself, the positive and negative of message attribution, the deterministic message of benefit, and the deterministic message of opportunity (Rothman, 2005). Stickiness has three categories: Length of time, frequency, and depth of visit (Lin, 2007). Finally, e-WOM has three categories: content, consistency, and volume (Viglia *et al.*, 2016). Survey respondents were asked their opinions about a particular website of a designer and branded bag store with physical/online stores.

With the goal of discovering stickiness and consumers' e-WOM behaviour, this study examines data from consumers with online shopping experiences in

Taiwan, using quota sampling via a website survey. We employ quota sampling to assure that the classification of the entire population is included in the selected samples. Quota sampling confirms that the population characteristics of a sample match those of the entire population (Cooper and Emory, 1995). We also take age, gender, and region to segment the samples since these three are popular demographics used as segmentation variables.

For people above 25 years old, the population of broadband Internet in Taiwan is estimated to be 13.15 million people, accounting for 57% of the total population (Taiwan Network Information Center, 2017). We determine what ratio of the population has engaged in online use according to gender, age, and region from a survey of Taiwan's online users by the Taiwan Network Information Center. We then determine the sample structure and how many samples in each cell we need. Among online consumers, males account for 49.8%, and females account for 50.2%. We divide our samples into three different age groups, 18-49 years (47.2%), 50-64 years (32.8%), and 65 and over (20.0%). We exclude those under 18 years since their income does not allow for purchasing expansive 3C products. We further divide our samples into four different regions of Taiwan: northern, central, southern, and eastern (and outer islands). Online consumers in the northern region account for 44.9%, consumers in the central region are 24.6%, consumers in the southern region are 27.4%, and consumers in the eastern region are 3.1%.

We next utilize stratified sampling, dividing the population into several online user groups based on the 2013 population statistics of Taiwan. Thus, the designed sample structure between males and females is 159 (49.7%) and 161 (50.3%), respectively. As to age, 18-49 years old are 151 (47.2%), 50-64 years old are 105 (32.8%), and above 65 years old are 64 (20.0%) in total. The population structure of online users among different regions in Taiwan is: northern Taiwan 144 (44.9%), center Taiwan 79 (24.6%), southern Taiwan 87 (27.4%), and eastern Taiwan and outer islands 10 (3.1%). Table 1 shows the sample structure.

To discover and eliminate potential problems in this study, we employ a pre-test to make sure of the validness of measurement adapted herein before carrying out a formal questionnaire. We collect thirty questionnaires to run the pre-test. The values of Cronbach's α of each variable, including endorsement

behaviour, sponsorship disclosure, information scent, message framing, stickiness, and e-WOM, are 0.697, 0.696, 0.838, 0.844, 0.896, and 0.803, respectively. All the values are over 0.6, thus passing our criteria of reliability analysis, and so we can say this pre-test exhibits internal consistency.

We then collect 320 samples in the formal test, categorized by gender, age, area, education level, and income level in Table 2. First, the actual samples between male and female are 160 (50%) and 160 (50%), respectively. Second, our samples within the three different age groups are 18-49 years (156, 48.75%), 50-64 years (97, 30.31%), and 65 and over (67, 20.94%). In addition, empirical samples by region are as follows: northern (142, 44.38%), central (79, 24.68%), southern (91, 28.44%), and eastern (8, 2.50%). We conduct ANOVA analysis to examine whether the sample characteristics will affect the result (e-WOM) and to present the sample as being representative or not. We adopt gender, age, region, and education as the characteristics that may affect the results. The p-values of 0.579, 0.844, 0.226, and 0.565, respectively ($p > 0.05$), for gender, area, region, and education level are not significant at affecting e-WOM.

Table 1
Sample structure

Items	18-49 years-old		50-64 years-old		Over 65 years-old		Total (%)
	Male	Female	Male	Female	Male	Female	
North Taiwan	34	34	23	24	14	15	144 (44.9%)
Central Taiwan	19	18	13	13	8	8	79 (24.6%)
South Taiwan	20	21	14	15	9	8	87 (27.4%)
East Taiwan & Islands	3	2	1	2	1	1	10 (3.1%)
Sub-total	76	75	51	54	32	32	320
Total	151 (47.2%)		105 (32.8)		64 (20.0)		320 (100.0%)

Table 2
Demographics of sample

Characteristics	Category	Count	Percentage (%)
Gender	Male	160	50.00
	Female	160	50.00
Age	18 ~ 49 years old	156	48.75
	50 ~ 64 years old	97	30.31
	Above 65 years old	67	20.94
	Below Junior high school	50	15.63
	Senior high school	57	17.81
Education	College	185	57.81
	Master	26	8.13
	Ph. D	2	0.62
	Student	32	10.00
Occupation	Government	10	3.13
	Manufacturing	17	5.31
	Commerce	61	19.06
	Service industry	80	25.00
	Information technology	6	1.88
	Transportation and warehousing	5	1.56
		34	10.63
	Self-employed profession	51	15.93
	Retirement	24	7.50
	Other		
Region	Northern Taiwan	142	44.38
	Central Taiwan	79	24.68
	Southern Taiwan	91	28.44
	Eastern Taiwan and islands district	8	2.50

4. Empirical result and testing of the hypotheses

We also use a pre-test to verify the validity of our measurements. We collect 30 questionnaires to run the pre-test, which checks the survey wording and meaning. The Cronbach's alpha values for the constructs of endorsement behavior, sponsorship disclosure, information scent, message framing, stickiness,

and e-WOM in the pre-test are 0.697, 0.697, 0.838, 0.844, 0.896, and 0.803, respectively. As these values are greater than .6, they are within the reasonable standard of internal consistency and reliability (Nunnally, 1978).

We jointly assess the reliability for all items of a construct by computing the composite reliability (CR). According to Fornell and Larcker (1981), if the composite reliability is larger than 0.6, then this indicates an acceptable fit of the data. Consequently, the higher the composite reliability (CR) of latent constructs is, the easier we might examine the latent constructs. In our samples, the calculated values of CR for endorsement behavior, sponsorship disclosure, information scent, message framing, stickiness, and e-WOM are respectively 0.917, 0.816, 0.906, 0.939, 0.884, and 0.884. All of the values are over 0.6, surpassing our criteria of reliability analysis, and so we say that this test illustrates internal consistency. The results of composite reliability of each variable are in Table 3. We also use Cronbach's alpha coefficient to examine the internal consistency reliability of each construct. Cronbach's alpha coefficients of all items of the six constructs from customer samples are greater than 0.7 and reveal high internal consistency (Bagozzi and Yi, 1988; Nunnally, 1978).

We additionally calculate the average variance extracted (AVE) to confirm the discriminant validity in our study. If average variance extracted is larger than 0.5, then discriminant validity between those variables is achieved (Fornell and Larcker, 1981). We calculate the average AVE of endorsement behavior, sponsorship disclosure, information scent, message framing, stickiness and e-WOM as 0.783, 0.750, 0.824, 0.840, 0.736, and 0.800, respectively. We find that all AVE are larger than 0.5 and reveal that the variables can correctly measure what they mean and hold discriminant validity.

In our model we adopt multiple fitness indices to examine the validity of the model. Table 4 lists the fit indices of the proposed measurement model. First, we calculate χ^2 / df is 3.499, which fits the criteria $2 < X < 5$ (Anderson and Weitz, 1992). Second, GFI represents the explained variance and covariance by the model (Jöreskog and Sörbom, 1993). The higher GFI is, the greater the variance that can be explained by the model. We see 0.869 for GFI, but this does not pass the criteria of > 0.9 . AGFI is 0.816. Note that we can adopt CFI (0.933) and NFI (0.910) to judge the data's validity, because these indices are above 0.9 (Anderson and Weitz, 1992). We further use RMR and RMSEA to provide

Table 3
Results of reliability and validity analysis

Construct	Item	Loading	Cronbach's α	CR	AVE
Endorsement			.917	.915	.783
	Attractiveness of endorser	.885			
	Self-expression of endorser	.942			
	Relevance to life	.843			
Sponsorship Disclosure			.816	.900	.750
	Persuasion knowledge of sponsor	.828			
	Timing of sponsorship	.714			
	Duration of sponsorship	.793			
Message Framing			.906	.949	.824
	Positiveness of message itself	.782			
	Positiveness of message attribution	.845			
	Determination of message: benefit	.905			
	Determination of message: opportunity	.849			
Information Scent			.939	.913	.840
	Relevance to user's need	.929			
	Trigger of user's action	.950			
Stickiness			.884	.893	.736
	Duration of stay on website	.838			
	Frequency of visiting website	.934			
	Depth of visit in website	.799			
e-WOM			.885	.923	.800
	Richness of content	.880			
	Consistency of recommendation	.897			
	Volume of online review	.788			

information about the fit of the model with unknown but optimally chosen parameter values for the population covariance matrix, if it is available (Bagozzi and Yi, 1988). In our study, RMR is 0.03, which is less than 0.05. RMSEA is 0.091. The results of RMR and RMSEA indicate a good fit.

Bagozzi and Yi (1988) referred to various criteria to judge the goodness-of-fit of the structural model. Only one criterion (say, GFI and/or AGFI must exceed 0.9) may be too conservative to judge the model, because the number of measurement items obviously influences the magnitude of GFI and AGFI (Bagozzi and Yi, 1988). The more measurement items there are in the

model (such as 54 questions in this study, excluding demographic variables), the less easy it is to reach the 0.9 overall suitability (GFI) evaluation criteria. Bollen (1989) argued that aside from GFI and AGFI, it is recommended to adopt CFI and NFI criteria in order to make the variation more stable; if these two criteria are greater than 0.9, then the study's model fits well. When the number of samples is larger, CFI is superior to GFI (Hu and Bentler, 1999). In addition, if a single criterion (such as this study's RMSEA) fails to pass the standard, then one should combine and refer to multiple criteria from different dimensions to test the model and make a reasonable judgment (Gerbing and Anderson, 1992) - that is, χ^2/df , RMR, CFI, NFI, and other criteria should have measurement consistency (Steenkamp and Baumgartner, 1998). However, we have to admit that there is still room for improvement in the fitness of this study's model, which is one of its limitations.

We now examine whether or not the empirical results support the hypotheses. Table 4 displays the structural model with coefficients and the significant relationships between the variables; almost all the variables follow the hypothesized direction. These results provide reasonable evidence to support the study's model. The endorsement behavior in the structural equation model positively affects information scent (H_{1a} : $\beta_{1a} = 0.016$, t -value = 0.117, p -value = 0.224), and hence we reject hypothesis H_{1a} , because the p values are not significant; otherwise, endorsement behavior in the structural equation model has positive effect on message framing (H_{1b} : $\beta_{1b} = 0.168$, t -value = 1.758, p -value < 0.05). Sponsorship disclosure has a positive effect on both information scent (H_{2a} : $\beta_{2a} = 0.653$, t -value = 4.463, p -value < 0.01) and message framing (H_{2b} : $\beta_{2b} = 0.479$, t -value = 4.106, p -value < 0.01). Information scent has a positive effect on stickiness (H_{3a} : $\beta_{3a} = 0.440$, t -value = 7.206, p -value < 0.01), and message framing has a positive effect on stickiness (H_{3b} : $\beta_{3b} = .372$, t -value = 5.373, p -value < 0.01). Next, the hypothesis is that information scent has a positive effect on message framing (H_4 : $\beta_4 = 0.122$, t -value = 2.434, p -value < 0.01). Finally, the last hypothesis is that stickiness has a positive effect on e-WOM (H_5 : $\beta_5 = 0.989$, t -value = 1.511, p -value < 0.01).

The effective step for detecting multicollinearity is to examine the correlation among the independent variables. We conduct this by checking a correlation matrix. The correlation between "stickiness" (ST) and "e-WOM"

Table 4
Test of measurement model

Hypothesized Path	Coefficient	t	p	Result
H1a: Endorsement Behavior→Information Scent	0.016	0.117	0.224	Not supported
H1b: Endorsement Behavior→Message Framing	0.168	1.758	0.040	Supported
H2a: Sponsorship Disclosure→Information Scent	0.653	4.463	0.000	Supported
H2b: Sponsorship Disclosure→Message Framing	0.479	4.106	0.000	Supported
H3a: Information Scent→Stickiness	0.440	7.206	0.000	Supported
H3b: Message Framing→Stickiness	0.372	5.373	0.000	Supported
H4: Information Scent→Message Framing	0.122	2.434	0.000	Supported
H5: Stickiness→ e-WOM	0.989	10.511	0.000	Supported

(EW) is positive (0.579), while the correlations of the dependent variable (EW) with each of the other two independent variables (“information scent” (IS) and “message framing” (MF)) are also positive with the dependent variables (e-WOM) (0.500 and 0.430). When writing these in shorthand, we use the Greek letter rho, ρ , to denote the correlation. Hence, we express the correlation between each independent variable with the dependent variable as follows: $\rho(\text{IS})(\text{EW}) = 0.500$, $\rho(\text{MF})(\text{EW}) = 0.430$, and $\rho(\text{ST})(\text{EW}) = 0.579$. We now can look at the correlations among our independent variables: $\rho(\text{IS})(\text{MF}) = 0.431$, $\rho(\text{IS})(\text{ST}) = 0.458$, and $\rho(\text{MF})(\text{ST}) = 0.324$. As for the remaining independent variables (CE and SD), the correlation coefficient test is the same and not repeated. We note that all independent variables are not highly correlated with one another (correlation coefficients are all smaller than 0.500). The relationship between “IS” and “MF” is not as strong as the correlation between those individual variables with “ST”, and the correlation is not high. Hence, we cannot conclude that multicollinearity is present in this model (see Table 5).

The mediation effect is usually based on the three-stage analysis proposed by Baron and Kenny (1986). Zhao, Lynch, and Chen (2010) later argued and amended the Baron and Kenny (1986) approach. Additionally, Efron (1979) proposed the bootstrap method, in which the number of existing samples is amplified by repeated sampling, so that the distribution of their number of times is closer to the method of population distribution. With the computer application

Table 5
Multi-trait multi-method matrix (correlation matrix)

Variables/constructs	(CE)	(SD)	(IS)	(MF)	(ST)	(EW)	AVE
	CE1	SD1	IS1	MF1	ST1	EW1	
	CE2	SD2	IS2	MF2	ST2	EW2	
	CE3	SD3		MF3	ST3	EW3	
				MF4			
CE (CE1 、CE2 、CE3)	0.789						0.783
SD (SD1 、SD2 、SD3)	0.551	0.603					0.750
IS (IS1 、IS2)	0.396	0.421	0.884				0.824
MF (MF1 、MF2 、MF3 、MF4)	0.504	0.513	0.431	0.708			0.840
ST (ST1 、ST2 、ST3)	0.369	0.381	0.458	0.324	0.724		0.736
EW (EW1 、EW2 、EW3)	0.431	0.416	0.500	0.430	0.579	0.720	0.800

Notes:

1. CE1, CE2, and CE3 are constructs for celebrity endorsement (CD); SD1, SD2, and SD3 are constructs for sponsorship disclosure (SD); IS1 and IS2 are constructs for information scent (IS); MF1, MF2, MF3 and MF4 are constructs for message framing (MF); ST1, ST2 and ST3 are constructs for stickiness (ST); EW1, EW2, and EW3 are constructs for e-word-of-mouth (EW); AVE is average variance extracted.
2. The values in each column are the average of the correlation coefficients of individual constructs. For example, the correlation coefficient of celebrity endorsement and celebrity endorsement is 0.789, which is derived from the correlation coefficient of CE1 to CE2 (0.845), the correlation coefficient of CE1 to CE3 (0.722), the correlation coefficient of CE2 to CE3 (0.800). Then, the average of a total of three correlation coefficient values is calculated as 0.789. The correlation coefficient of celebrity endorsement and sponsorship disclosure is 0.551, which is derived from the correlation coefficient of CE1 to SD1 (0.643), the correlation coefficient of CE1 to SD2 (0.613), The correlation coefficient of CE1 to SD3 (0.559), the correlation coefficient of CE2 to SD1 (0.529), the correlation coefficient of CE2 to SD2 (0.541), the correlation coefficient of CE2 to SD3 (0.531), the correlation coefficient of CE3 to SD1 (0.521), The correlation coefficient of CE3 to SD2 (0.536), the correlation coefficient of PE3 to SD3 (0.482). We then compute the average of a total of nine correlation coefficient values and obtain 0.551. The rest of the other cases are similar.

of the structural equation model, the bootstrap method becomes the latest famous method to explore the mediation effect. Next, the bootstrap method is carried out in a virtual manner, and the confidence interval can be calculated via repeated extractions of 1000 times (Efron and Tibshirani, 1993). In the SEM model, because we want to detect and analyze the mediation effect, we use the bootstrap method to obtain the confidence interval of the indirect effect, which can be called the mediation effect if the 95% confidence interval does not contain zero

and reaches a significant level. If the direct effect in the 95% confidence interval contains 0, then it means that the direct effect is not significant, with a full mediation effect. If the indirect effect and the direct effect in the 95% confidence interval are not included in 0, and all reach a significant level, then the total effect in the 95% confidence interval does not contain 0, reaching a significant level, and it can be deemed as a partial mediation effect (Mackinnon, 2008; Preacher and Hayes, 2008).

We examine the mediation effects through the bootstrap method from CE (SD) to ST of the study. There are four types of the serial mediation effect: 1) Does MF own a mediation effect between CE and ST (Case 1)? 2) Does IS have a mediation effect between CE and ST (Case 2)? 3) Does MF have a mediation effect between SD and ST (Case 3)? 4) Does IS own a mediation effect between SD and ST (Case 4)? Table 6 lists the results. We find that mediation effects are present in case 1, case 2, and case 4. For example, case 1 shows that the confidence interval (0.034~0.283) of the indirect effect (0.140; $0.140 = 0.634 \times 0.221$) does not contain 0 and has a significant effect ($p < 0.05$), indicating that MF has a mediation effect between CE and ST. The direct effect of CE \rightarrow ST (0.365) of the confidence interval (0.192~0.480) does not contain 0, up to a significant effect, and the total effect (0.505) = direct effect + indirect effect ($0.505 = 0.365 + 0.140$) of the confidence interval (0.320~0.691) does not contain 0, thus achieving significant results. This shows that the message frame (MF) is a partial mediation effect between celebrity endorsement (CE) and stickiness (ST).

We also examine the mediation effects from the bootstrap method from MF (IS) to EW of the study. There are two types of the serial mediation effect: 1) Does ST own a mediation effect between MF and EW (Case 5)? Does ST have a mediation effect between IS and EW (Case 6)? Table 6 lists the results. We find that they exhibit mediation effects in case 5 and case 6. For example, case 5 shows that the confidence interval (0.178~0.439) of the indirect effect (0.298) does not contain 0 and has a significant effect ($p < 0.05$), indicating that ST has a mediation effect between MF and EW. The direct effect of MF \rightarrow ST (0.482) of the confidence interval (0.281~0.664) does not contain 0 up to a significant effect, and similarly the direct effect of ST \rightarrow EW (0.618) of the confidence interval (0.521~0.733) does not contain 0 up to a significant effect; the total

Table 6
Empirical result of serial mediation effects

Effects	Contents	Estimate	p-value	Confidence interval
Case 1: CE → MF → ST				
Indirect effect	CE → MF → ST	0.140	p < 0.05	0.034 ~ 0.283
Direct effect	CE → MF	0.634	p < 0.05	0.489 ~ 0.766
	MF → ST	0.221	p < 0.05	0.050 ~ 0.391
	CE → ST	0.365	p < 0.05	0.192 ~ 0.480
Total effect	CE → ST	0.505	p < 0.05	0.320 – 0.691
Case 2: CE → IS → ST				
Indirect effect	CE → IS → ST	0.208	p < 0.05	0.117 ~ 0.322
Direct effect	CE → IS	0.474	p < 0.05	0.324 ~ 0.634
	IS → ST	0.439	p < 0.05	0.336 ~ 0.549
	CE → ST	0.265	p < 0.05	0.178 ~ 0.376
Total effect	CE → ST	0.473	p < 0.05	0.359 ~ 0.668
Case 3: SD → MF → ST				
Indirect effect	SD → MF → ST	0.010	p < 0.05	-0.155 ~ 0.172
Direct effect	SD → MF	0.752	p < 0.05	0.623 ~ 0.854
	MF → ST	0.013	p < 0.05	-0.203 ~ 0.231
	SD → ST	0.562	p < 0.05	0.340 ~ 0.833
Total effect	SD → ST	0.572	p < 0.05	0.385 – 0.720
Case 4: SD → IS → ST				
Indirect effect	SD → IS → ST	0.203	p < 0.05	0.102 ~ 0.323
Direct effect	SD → IS	0.597	p < 0.05	0.388 ~ 0.744
	IS → ST	0.391	p < 0.05	0.191 ~ 0.481
	SD → ST	0.377	p < 0.05	0.231 ~ 0.537
Total effect	SD → ST	0.581	p < 0.05	0.444 ~ 0.821
Case 5: MF → ST → EW				
Indirect effect	MF → ST → EW	0.298	p < 0.05	0.178 ~ 0.439
Direct effect	MF → ST	0.482	p < 0.05	0.281 ~ 0.664
	ST → EW	0.618	p < 0.05	0.521 ~ 0.733
	MF → EW	0.340	p < 0.05	0.254 ~ 0.433
Total effect	MF → EW	0.638	p < 0.05	0.470 – 0.815
Case 6: IS → ST → EW				
Indirect effect	IS → ST → EW	0.354	p < 0.05	0.247 ~ 0.482
Direct effect	IS → ST	0.607	p < 0.05	0.455 ~ 0.744
	ST → EW	0.584	p < 0.05	0.452 ~ 0.745
	IS → EW	0.303	p < 0.05	0.166 ~ 0.425
Total effect	IS → EW	0.658	p < 0.05	0.524 ~ 0.811

Notes: CE is celebrity endorsement; SD is sponsorship disclosure; MF is message frames; IS represents information scent; ST is stickiness; EW is e-word-of-mouth.

effect (0.638) = direct effect + indirect effect (0.638 = 0.340 + 0.298) of the confidence interval (0.470~0.815) does not contain 0, reaching significant results. This shows that the message frame (ST) has a partial mediation effect between message frame (MF) and electronic word-of-mouth (EW).

Bagozzi and Yi (1988) argued for the necessity of a rival model and recommended that one adopt the difference in the χ^2 value to compare and examine the validity of the rival model. Kline (2011) employed the values of GFI, CFI, RMSEA, and RMSR and the related indices of the path coefficient to evaluate the model. Kline (2011) also suggested that the significant ratio is the effective decision rule for comparing the study model and the rival models.

The rival model helps check if the causality among mediators is really needed, which originates from the comprehensive school framework (Gefen and Straub, 2004; Lu *et al.*, 2010). Rival model 1 specifies the direct effects between endorsement and sponsorship and the cognitive information effect of website cues without mediators, which are based on the structural school framework (Rapp *et al.* 2013). Rival model 2 examines if the causality among mediators is really needed, which originates from the comprehensive school framework (Gefen and Straub 2004; Lu *et al.* 2010). Table 7 helps us analyze the rival models. The direct effect from endorsement and sponsorship to e-loyalty is not more effective than the indirect effect through the mediators, i.e. message framing (MF) and information scent (IS), in the original model. The most important result is that the significant ratio of the original model (87.50%) is larger than rival model 1 (60%) and rival model 2 (50%). Because the original model enjoys the highest significant ratio and has a higher path total effect, we conclude that the original model is better than the rival models. The causal relationship among those variables holds.

5. Discussion and conclusion

One of the most important obstacles to overcome when developing a new website is creating a design that will both attract and stick consumers to the site. Whereas consumers visit hundreds of webpages, they generally only stick or stay on a site for a short time before opting out and moving on to a new site. This paper examines the causal relationship among information disclosure, the

Table 7
Comparison of rival models

Rival Model 1		Rival Model 2	
Significant Ratio		60.00%	
EB→ST		Not Supported	
SD→ST		Supported	
IS→ST		Supported	
MF→ST		Not Supported	
ST→e-WOM		Supported	
Significant Ratio		50.00%	
EB→IS		Not Supported	
SD→IS		Supported	
EB→MF		Not Supported	
SD→MF		Not Supported	
IS→ST		Supported	
MF→ST		Not Supported	
IS→MF		Not Supported	
EB→ST		Supported	
SD→ST		Supported	
ST→eWOM		Supported	
χ^2/df	5.988		3.660
CFI	0.864		0.930
NFI	0.842		0.907
GFI	0.792		0.864
AGFI	0.724		0.814
RMSEA	0.125		0.091
RMSR	0.134		0.036

cognitive information effect of cues, and website stickiness. The cognitive information effect of a website includes its information scent, message framing, information retrieval, and information filtering (Sorensen *et al.*, 1999). Amongst them, information scent and message framing utilize individuals' short-term memory, and information retrieval and filtering utilize individuals' long-term memory (Pirolli and Card, 1999). In some emerging industries, the life cycle of products is quite short term. Therefore, individuals' short-term memory must be highlighted. From the academic viewpoint, while other researchers have focused on information retrieval and filtering to highlight the extraction process in consumers' long-term memory (Moody and Galletta, 2015), this study emphasize the short-term memory of individuals, i.e. information scent and message framing, to uphold the theoretical contributions in the CIP concept. We combine the message framing and information scent concepts proposed by Rothman (2005) and Gibson *et al.* (2016) to form the memory mechanism based on the learning process in CIP. In sum, our findings show that sponsorship disclosure, information scent, and message framing are important factors in increasing the stickiness of customers to websites. Both sponsorship disclosure and endorsement behavior confirm the CIP concept and offer further theoretical contributions by applying information scent and message framing.

From the practical viewpoint, through empirical investigations we see that sponsorship disclosure is a critical factor to information scent, which further has a significantly positive effect on stickiness of customers. There may exist two reasons for this. First, sponsorship disclosure provides an information cue to help consumers find a linkage with a positive brand image (Kerne and Smith, 2004). Second, the more the advertising messages align with a consumer's self-interest, the stronger the persuasion becomes. If purchasing products is expected, then the products purchased are comparable to the consumers' subjective expectations and perceptions. When consumers' perception of a product is consistent with their expectation, then their expectation and interest level will be affected by the product information (Viglia *et al.*, 2016). Sponsorship disclosure then is positively related to information scent, while information scent is positively related to stickiness. Moreover, message framing is an important intermediary variable. Sponsorship disclosure also has a positive effect on stickiness through message framing. Sponsorship gives consumers opportunities to find product

information and allows them to form stickiness. This finding is similar to that of Nebenzahl and Jaffe (1988), in which sponsorship disclosure has a significant impact on consumers' purchases. Therefore, using sponsorship disclosure as a marketing strategy is definitively imperative (Boerman *et al.*, 2014b; 2017) to managers.

Marketing managers can use sponsorship disclosure or celebrity endorsements for their marketing plans. The advertisements can be used during the product growth period, while the company is able to pay for endorsement and sponsorship due to sufficient profits (Moody and Galletta, 2015). Our study can be used for new product development in both emerging and traditional markets. In fact, brand extension can be increased when celebrities and sponsors are carefully selected during product development. Managers can highlight the importance of finding sponsors who are willing to disclose complete information and ask for cues for the corporate image, reputation, and brand equity of large enterprises (Kaplan and Haenlein, 2010). After applying the solutions proposed by this study, businesses should gain more effective and efficient product development, providing consumers with better information transparency around products (Overton, 2018).

The empirical contribution of this study is to help businesses understand the effects on online consumer behavior, i.e. stickiness and e-WOM, by building consumers' cognition, i.e. information scent and message framing. This finding is particularly applicable to start-ups in emerging industries such as the online game industry so as to help develop consumers' stickiness and e-WOM. For start-ups in emerging industries, there are not enough loyal customers to create e-WOM to gradually produce long-term marketing effects. The life cycle of on-line game products is quite short term - namely, it is not easy to form e-WOM through long-term cognition (Hwang and Jeong, 2016). Therefore, based on the findings of this study, start-up companies can use endorsement disclosure and sponsorship disclosure to create e-WOM. This result is similar to that of Hwang and Jeong (2016). Emerging businesses can employ information disclosure so that consumers will be able to recognize their own needs and stimulate themselves to feel the necessary to actions.

Since we find that information scent is the most important factor in stickiness, emerging companies need to design a more convenient and

frequently-updated website interface to attract consumers on an ongoing basis, as well as to attract others to stay and become sticky consumers. This finding is similar to that of Moody and Galletta (2015). Furthermore, online consumers regard message framing as the resultant message causing their positive attitude (Overton, 2018). Through the operation of information scent and message framing effects, consumers can enjoy the atmosphere of product image and subsequently be interested in it (Mudambi and Schuff, 2010). This is the CIP process of consumers for setting up the latter behavior of stickiness and e-WOM. Therefore, start-up companies do not need to use information retrieval and filtering on the Internet (Weisfeld-Spolter, 2014), but instead can utilize the cognitive effect, i.e. information scent and message framing, to obtain stickiness and e-WOM behavior. Emerging companies should design their website's information cues for products so as to contribute to information transparency to their consumers (Chiu *et al.*, 2009). The result of this study provides online emerging companies with useful evidence for constructing their relationship with consumers. Comparing the impacts of endorsements with sponsorship disclosure, we find that consumers are more interested in sponsorship disclosure. Thus, emerging companies should design their exposed information about products and website cues to create information transparency with their consumers (Rapp *et al.*, 2013).

Finally, common method variance is a research limitation. Podsakoff and Organ (1986) indicated that common method variance (CMV) when self-reported surveys are employed as a measurement tool is one potential issue in a behavioral study. The respondents rated their perception of the predictor variable and criterion variable, and the exogenous variables and endogenous variables were collected from the same rater or source (Podsakoff *et al.*, 2003). We present a temporal separation in our online survey by introducing a cover picture and short story between the independent variable and dependent variable so as to create a time lag to ensure that the measurement of the independent variable is not directly connected to the dependent variable (Podsakoff *et al.*, 2003). Our research design (temporal separation) tries to handle the issue of common method variance by decreasing the perceived relevance of previously recalled information in short-term memory. Using Harman's one-factor analysis of unrotated principal components method, we see that there are nine factors

with eigenvalues greater than 1.0 rather than a single factor within the 54 items. The nine factors together account for 76.10% of the total variance, and no general factors are obvious. Additionally, the interpretation variation of the first factor is 41.96%, meaning that most of the explanatory power is not explained by the first factor, showing that there is no CMV in this measurement questionnaire and that CMV issue may not be a serious problem in our study (Malhotra, Kim and Patil 2006). We do admit that there is still room for improvement in the survey process. This can be deemed as a limitation of this study and could be improved by future efforts.

This study aims to investigate stickiness through the cognitive information effect of website cues. Therefore, our questionnaire focuses on the answers from website consumers instead of those from website designers. The dyad samples can collect more effective information and can be set as the next target in the future. Moreover, length of time and frequency and depth of visit, rather than stickiness only, are the ultimate goals of the online emerging platform marketers. Therefore, transforming stickiness into these goals can be another issue for online emerging platform marketers to evaluate and analyze. In the future, research could pay more attention to this issue in order to provide more useful strategies for managers.

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