

Various social media marketing activities affect online brand trust

各種社群媒體行銷活動影響線上品牌信任

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Abstract: The purpose of the study is to explore the three types of social media marketing (SMM) activities (internet celebrity endorsements, official website messages, and electronic word-of-mouth) derived from paid, owned, and earned (POE) strategies, and to explore the causal relationship between social media marketing activities, brand image/brand familiarity, and online brand trust on Instagram. The value of the study is to explore the mediating effect of brand image/brand familiarity between social media marketing activities and online brand trust. This study collected 500 valid online questionnaires in Taiwan in the Spring of 2022 and estimated by structural equation modeling (SEM). Empirical results show that brand image and brand familiarity successfully play a mediating role between social media marketing activities and online brand trust. Additionally, perceptual differentiation plays a significant moderating role in building online brand trust. Moreover, internet celebrity endorsement is the most effective tool to influence brand image and brand familiarity, and then affect online brand trust.

Keywords: Brand image, brand familiarity, online brand trust, perceived differentiation, social media marketing activities.

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摘要：本研究旨在探討付費、自有和贏得（POE）策略衍生的三種社群媒體行銷（SMM）活動（網紅代言、官網消息和電子口碑），並探討社群媒體行銷活動、品牌形象/品牌熟悉度和 Instagram 線上品牌信任度間因果關係。本研究價值在探究品牌形象/品牌熟悉度在社群媒體行銷活動與線上品牌信任的中介作用。本研究在 2022 春於台灣收集 500 份有效線上問卷，並採用結構方程模型(SEM)。實證結果表示，品牌形象和品牌熟悉度成功在社群媒體行銷活動和線上品牌信任間扮演中介效果；同時，知覺差異在建立線上品牌信任上發揮調節效果。且網紅代言是影響品牌形象和品牌熟悉度進而影響線上品牌信任的最有效工具。

關鍵詞：品牌形象，品牌熟悉度，線上品牌信任，知覺差異，社群媒體行銷

1. Introduction

Social media marketing (SMM) refers to the creation of specific messages or content on social network platforms for marketing purposes (Ibrahim *et al.*, 2021). The purpose of SMM is to attract the attention of consumers and generate discussion among the online public (Joo and Kim, 2020). SMM is a marketing strategy that encourages audiences to spread the above marketing content through their personal social network, and then improve the relationship and satisfaction with customers (Wibowo *et al.*, 2021).

As a result, enterprises usually design a set of customer-oriented paid, owned, and earned (POE) online marketing activities in SMM, named POE strategy (Allison and Jones, 2022). POE strategy has become a new language in online marketing activities and POE is the most noteworthy activity in SMM (Connelly, 2013). In POE strategies, “P” refers to paid social media marketing (PSM), so PSM refers to advertising activities paid by companies for existing distribution channels (Ahmad *et al.*, 2019; Jayson *et al.*, 2018). “O” refers to owned social media activity (OSM), so OSM is the launch of social media messages from brand owners (enterprises) on distribution channels under their control (Bilgin 2018; Sanny *et al.*, 2020; Wibowo *et al.*, 2021). “E” refers to earned social media activities (ESM), so ESM means brand-related marketing activities that are not

produced from brand owner directly, thus making the company a source of information on the distribution channel (Alrwashdeh *et al.*, 2019; Evgeniy *et al.*, 2019; Farzin and Fatashi, 2018; Xie and Li, 2015).

Amongst, Internet celebrity endorsements are the most common PSM in SMM (Allison and Jones, 2022; Connelly, 2013); official website messages are the most common OSM (Allison and Jones, 2022; Connelly, 2013); the most common ESM is brand-related reviews conveyed by electronic word-of-mouth (Allison and Jones, 2022; Harrison, 2013). Therefore, these three variables in this study are more important than other activities (Sciarrino *et al.*, 2019). Therefore, the research question of this study is: Which social media marketing has the greatest impact on customers' brand knowledge (including brand image and brand familiarity) in the POE strategy of enterprises, and thus achieves the greatest online brand trust?

This study uses brand image and brand familiarity as mediating variables in the model, constituting the first research value and contribution of this study. Many scholars have explored the impact of social media marketing activities on brand image, including paid social media (Ahmad *et al.*, 2019; Ladkoo and Ismael, 2018; Lee and Watkins, 2016), own social media (Bilgin, 2018; Sanny *et al.*, 2020), and earned social media (Alrwashdeh *et al.*, 2019; Evgeniy *et al.*, 2019; Farzin and Fattahi, 2018). Thus, brand image emphasizes consumer recognition and association (Ahmad *et al.*, 2019; Ansary and Hashim, 2018). Basically, brand image is a common mediation variable. Given that brand knowledge includes brand image and brand familiarity, they constitute the level of brand perception in the minds of consumers (Cheung *et al.*, 2020). And the literature rarely studies the impact of social media marketing activities on brand familiarity. We then added brand familiarity as a new mediating variable, a novel effort in this study. Therefore, the impact of social media marketing activities on online brand trust requires content that explores brand knowledge. Because the brand is recognized by consumers (i.e., brand knowledge), this includes consumers' attitude preference for the brand (i.e., brand image), as well as consumers' memories of familiar brand recognition (i.e., brand familiarity). Therefore, brand familiarity is the integration

of all the experiences that consumers remember having contact with the brand. Brand familiarity emphasizes the recall and memory aspects of an experience (Ruiz-Equihua *et al.*, 2020). That is, the level of information retrieval and information screening in the cognitive information process (CIP) mechanism, which is long-term cognitive information. As a result, brand familiarity can be more deeply ingrained in consumers' memories, resulting in more sustainable responses. As a result, brand familiarity can penetrate deeper into consumers' memories, resulting in more consistent response actions, and consistent responses from consumers are the goal of marketers (Zhu *et al.*, 2022).

Additionally, this study introduces perceived differentiation as a moderating variable, which constitutes another research value and contribution of this study. This is based on perceived differentiation can enhance various subjective thinking about brands in audience cognition, which can produce a unique evaluation of the audience's online brand trust (He *et al.*, 2012; Lee and Jung, 2016). Brand marketers then differentiate the perceived differentiation of a brand to meet audience expectations and influence their brand preferences and brand trust (Atulkar, 2020; He *et al.*, 2012).

2. Literature review and hypothesis development

The information processing is the concept that individuals handle the information they encounter, instead of only stimulate and response. The concept of CIP is proposed by George A. Miller and is used to explain the dimensions that emphasize how one's cognitive processes including attention, perceived, encode, interest, memory, and retrieval information (Anderson, 2010). The cognitive information effect of a social media messages then includes the informing effect, reminding effect, and enhancing amusement effect since that the visual messages have reformed into a file of processing series within individual memory organisms (Lovett and Staelin, 2016).

Enterprises pay internet celebrities to endorse corporate products, which is a common type of PSM. When consumers are exposed to internet celebrity endorsements, consumers are usually fans of internet celebrities and consumer

cognition easily emotional enters into an informing effect (Lovett and Staelin, 2016; Pirolli and Card, 1999). Consumer perception can easily set the content of internet celebrities' product endorsements, such as professional knowledge or life sharing, as the exhortation of close friends or idols (Silva *et al.*, 2020). This means that the meaning of the product has been transferred to the consumer through internet celebrity endorsements (Wang and Liu, 2022). This meaning will make it easier for consumers to recall, rethink and remember the brand (Pradhan *et al.*, 2016). Therefore, the information filtering function in the consumer cognitive information effect is activated. Consumer memory is activated, that is, evokes the consumer's long-term memory, and producing a persuasive effect (Lovett and Staelin, 2016).

Enterprise posts messages on their official websites they own is a common type of owned social media (OSM). When consumers are faced to company's official website, consumer cognition easily arouses into a reminding effect (Pirolli and Card, 1999). Based on the fact that the company's official website is the brand's own territory, OSM is naturally the basis for active content marketing (Allison and Jones, 2022). OSM is a procedure of reminding that communicates the meaning of a product to consumers through content marketing (Bilgin, 2018). Thus, the degree to which OSM's prompts (inform) content matches the consumer's personal tastes is usually less relevant (Lovett and Staelin, 2016). When consumers are exposed to OSM, they gain additional utility from branded content (Lovett and Staelin, 2016). However, consumer perception can easily set OSM as official decree propaganda or informational nature (Pirolli and Card, 1999). Consumers often see OSM as a reminder rather than a concern or notice. Therefore, the cue effect only noticeably enters the short-term memory of consumers (Pirolli and Card, 1999).

As for ESM, electronic word-of-mouth is common type of ESM. When consumers are exposed to electronic word-of-mouth, consumers can obtain enhance amusement effect (Lovett and Staelin, 2016). ESM conceptually represents prospective, actual, or previous customer statements about a product or company, whether positive or negative. These statements can be obtained from

numerous people and institutions through the internet platform (Alrwashdeh *et al.*, 2019). When consumers are exposed to ESM, consumers can learn about other customers' tastes (such as brand-related reviews), or satisfaction with the brand (Moody and Galletta, 2015; Pirolli and Card, 1999). In consumers' perception, it is easy to set ESM as objective and fair third-party information, and viewers are cognitively more likely to pay attention to these peer review messages. Cognitively, ESM can bring enhanced pleasure to consumers. Consumers will find the same opinions and emotional identities with each other through frequent comparison of ESM messages, so as to promote the social enhancement amusement effect (Lovett and Staelin, 2016). Figure 1 shows the research framework of this study.

2.1 Relationships between official website message and brand image and brand familiarity

Official website message or social media message is persuading and communication interface, and it offers the opportunity to reduce misunderstandings regarding a brand (Bilgin, 2018; Cheung *et al.*, 2020). Through

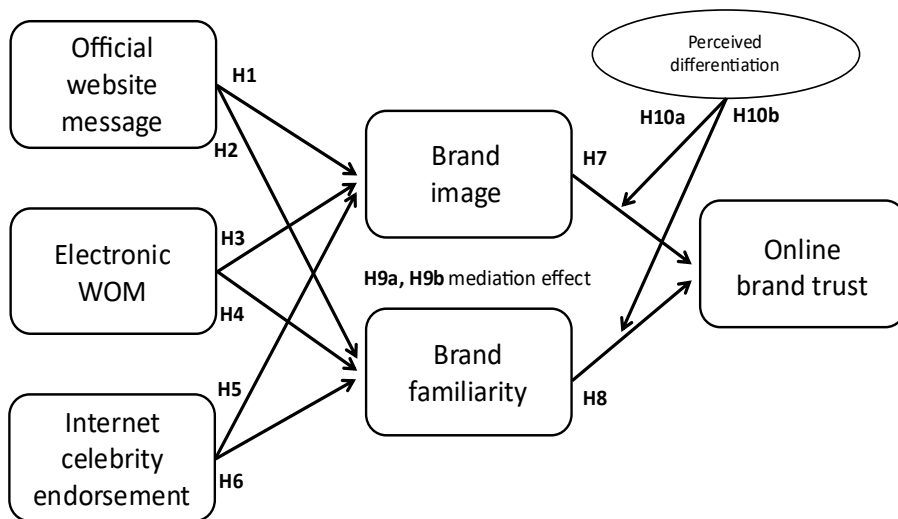


Figure 1

The research framework of this study

the communication process of official website message, the brand image clearly shows how concepts are connected in the human mind, based on associative network theory (Wibowo *et al.*, 2021). Customers' cognition creates brand image through nodes and linked to customers' memories, thus, it produces the relations between brand image and official website message (Sanny *et al.*, 2020).

Moreover, once a brand advertises frequently through official website message, consumers think of a brand as familiar (McClure and Seock, 2020). Therefore, customers easily recall and recognize a well-known brand (Gretry *et al.*, 2017). Consumers may also have greater motivation to understand the official website message of highly familiar brands (Ruiz-Equihua *et al.*, 2020). Thus, official website message might lead customers to recognize brands easily and form brand familiarity (Zhu *et al.*, 2022). Thus, we present these two hypotheses:

H1: Official website message positively influences brand image.

H2: Official website message positively influences brand familiarity.

2.2 Relationships between electronic word-of-mouth and brand image and brand familiarity

Electronic word-of-mouth encourages consumers to share their opinions with others (Kimmel and Kitchen, 2014). The social learning mechanism indicated that the information received by consumers would prompt them to form their own self-images. Based on associative network theory, consumers' cognition creates brand image through nodes that link to consumers' memories (Salinas and Pérez,, 2009). Therefore, the more information customers receive, the better they can cause brand building in their minds, which eventually forms the brand image.

Furthermore, based on the source attractiveness model, public acceptance of advertisements or word-of-mouth is based on familiarity, likability, and similarity (Evgeniy *et al.*, 2019). The repeated messages cause customers to regard the brand as a familiar object. Familiarity can easily evoke brand names in consumer memories (Gretry *et al.*, 2017), playing an important role as a moderator of repetition effects. Thus, we present these two hypotheses:

H3: Electronic word-of-mouth positively influences brand image.

H4: Electronic word-of-mouth positively influences brand familiarity.

2.3 Relationships between internet celebrity endorsement and brand image, brand familiarity

The credibility of internet celebrities first translates meaning into their public image, subsequently transfers to the endorsed brand, and eventually shifts to consumers (Xie and Lee, 2015). This indicates that the meaning of the product had been shifted to the customer through internet celebrity endorsement (Wang and Liu, 2022). The meaning that is transferred to customers makes it easier to recall, rethink, and remember the brand (Pradhan *et al.*, 2016). Appropriate and effective advertising is helpful for companies and marketers to improve their brand image (Aw and Labrecque, 2020).

Tan *et al.* (2011) also showed that internet celebrity endorsement leads to brand familiarity. Strong brand familiarity can easily evoke a brand name in a consumer's memory. They provided strong evidence that the effectiveness of communication is directly related to previous familiarity with the brand (Zhu *et al.*, 2022). The validity of an information rests on the familiarity, similarity, and likeness with endorsers (Erdogan, 1999). Thus, we present these two hypotheses:

H5: Internet celebrity endorsement positively influences brand image.

H6: Internet celebrity endorsement positively influences brand familiarity.

2.4 Relationships between brand image, brand familiarity, and online brand trust

Brand trust refers to a perception of security stood from the customers in their intercommunication to a brand, which is according to the feelings that a brand is stable and sound to the favor and benefit of the customers (Portal *et al.*, 2019). Brand image is a major determinant of customer trust; when a customer owns a positive perception of a brand, this process owns a favorable effect on consumer trust (Tan *et al.*, 2011). Therefore, a strong company image is a major factor in consumer trust (Atulkar, 2020).

Familiarity causes a higher evaluation of a brand, and confronting a familiar brand can make customers feel close and more confident (Tan *et al.*, 2011). It can provide people with an alternative way of not being able to experience a product (Zheng *et al.*, 2021). Brand familiarity builds brand confidence, which leads to positive brand appraisal and, ultimately, brand trust (Tan *et al.*, 2011). This means that people may further agree with the product or brand due to the provided information and then form brand trust (Atulkar, 2020). Thus, we present these two hypotheses:

H7: Brand image positively influences online brand trust.

H8: Brand familiarity positively influences online brand trust.

2.5 Brand image and brand familiarity mediate the link between social media marketing activities and followers' online brand trust on Instagram

Here a causal relationship is social media marketing activities (official website message, electronic word-of-mouth, and internet celebrity endorsement) and followers' online brand trust response on Instagram, in which brand image and brand familiarity are deemed mediation mechanisms. For micro-celebrities on Instagram, social media message develops brand image through followers to receive or accept the communication process of official website message, electronic word-of-mouth, and internet celebrity endorsement; then the nodes link to the memory of followers and show how concepts are connected in the customer mind based on associative network theory (Wibowo *et al.*, 2021). As followers have good perceptions of a brand, this would produce a good impact on the followers' perceptions and then strengthen their online brand trust (Chakraborty and Bhat, 2018; Gretry *et al.*, 2017). Therefore, brand image suggests that followers are convinced by social media marketing activities, which produce followers' online brand trust responses.

Similarly, followers accept the communication process of SMM activities from familiarity, likability, and similarity, based on the source attractiveness model (Evgeniy *et al.*, 2019). Thus, social media message, electronic word-of-mouth, and

internet celebrity endorsement might lead customers to recognize brands easily and thus produce brand familiarity (Zhu *et al.*, 2022). Brand familiarity then builds brand confidence, which leads to positive brand appraisals and, ultimately, online brand trust (Tan *et al.*, 2011; Zheng *et al.*, 2021). Therefore, brand familiarity derived from social media marketing activities significantly influences followers' online brand trust responses. Thus, we present these two hypotheses:

H9a: Brand image mediates the link between social media marketing activities on Instagram and followers' online brand trust.

H9b: Brand familiarity mediates the link between social media marketing activities on Instagram and followers' online brand trust.

2.6 The moderating role of perceived differentiation

Various marketing researches obviously focus that differentiation is recognized from consumers as different and needed to be evaluated (Davies, 2008). Useable product differentiation demands separating a brand or a product from rivals in the attribute which is related, substantial, and functional (Lee and Jung, 2016). Perceived differentiation produces distinct subjective recognition to a brand within the individual mind, that helps to create unique judgments of different online brand trust (He *et al.*, 2012). Marketers would differentiate a perceived differentiation to a brand to meet consumer expectation and can influence the preference for a brand, inducing different online brand trust (Atulkar, 2020; He *et al.*, 2012). Furthermore, Lee and Jung (2016) indicated that owning perceived differentiation can help to reinforce product positioning and brand judgment. Thus, the possible perception difference between familiar and unfamiliar brands should be considered a crucial factor in order to influence effective online brand trust. Thus, we present these two hypotheses:

H10a: Perceived differentiation positively moderates the relationship between brand image and online brand trust.

H10b: Perceived differentiation positively moderates the relationship between brand familiarity and online brand trust.

3. Research method

3.1 Data collecting procedure and measurement

We conducted online survey to collect data of respondents among Instagram users in Taiwan. These respondents are referring to digital influencers and these are normally being considered as paid social media since they are exposed in the internet celebrity endorsement and advertisement. Furthermore, this study requested these respondents to confirm they had been exposed to official website message (owned social media) from their social media, blogs, twitter and/or Facebook pages. Additionally, this study asked these respondents to checked that they had been exposed to e-WOM, and/or brand-related comments from peers (earned social media). The target audience of this study is people who use Instagram and focus on the purchasing behavior related to clothing products.

In the beginning of this questionnaire, this study points out the indicative words as follows: "You are the heavy user (3 hours per day) of social media (Instagram). Now, you are surfing the internet to browse something and find that some products are on display. The pages of the shop mention about the clothing products (clothes and shoes), you also browsed some comments by publics or heard of the recommendation from your friends. Furthermore, you find that disclosed celebrities are promoting them. Please answer the following issues".

Scholars found that there were no obvious differences between famous and fictitious brands in marketing appeals effects (Washington *et al.*, 2015). To eliminate the consequences of various levels of brand familiarity and established brand associations on the results, we create a fictional brand (Breves *et al.*, 2021). Since this study is on the effectiveness of cause brand familiarity, we chose to use the fictitious brands to control the existing knowledge of consumers.

Social media (official website) message had 12 measurable items from four dimensions: entertainment, customization, interaction, and trendiness (Wibowo *et al.*, 2021). Electronic word-of-mouth had nine measurable items from three dimensions: E-WOM quantity, E-WOM credibility, and E-WOM quality (Evgeniy *et al.*, 2019). Internet celebrity endorsement had nine measurable items from three

dimensions: messages attractiveness, messages trustworthiness, and messages expertise (Ohanian, 1990). Brand image had nine measurable items from three dimensions: functional image, affective image, and reputation image (Ansary and Hashim, 2018). Brand familiarity had six measurable items from two dimensions: informational familiarity, and self-rated familiarity (Stylidis *et al.*, 2020). Online brand trust had six measurable items from two dimensions: brand intention and brand reliability (Portal *et al.*, 2019). Perceived differentiation had three measurable items, based on Davies (2008).

This study included 500 respondents due to budget constraints. Given that the '10-times rule' of sample-to-item ratio was normally accepted in the structural equation modelling (SEM) model, there were 53 items and 500 respondents (samples), and that the sample (sample-to-item ratio) is rather borderline to test the study model (Hair *et al.*, 2017; Kline, 2016; Memon *et al.*, 2020). This study used SEM and adopted SPSS-AMOS software (25.0 version)(Jöreskog and Sörbom, 1993).

This survey employed quota sampling to affirm the representativeness of respondents so that the statistical characteristics of respondents fit the demographic features of the population. This study separated the population into different Instagram user sub-groups according to the 2021 population statistics for Taiwan. This study classified the population data into age and gender, and deemed these common demographics as segmentation variables. This survey decided the of the population participated ratio in Instagram use in Taiwan (based on age and gender) from a survey an investigative report of Instagram users in Taiwan from the NapoleonCat Survey in 2022 February. As to the demographic features of the population, the total number of Taiwan's Instagram users was 9.25 million, accounting for 46% of total population. Of them, 4.32 million were men (46.7%), and 4.93 million were women (53.3%). Regarding age, 0.48 million (5.2%) were 13 to 17 years old, 2.20 million (23.8%) were 18 to 24 years old, 3.39 million (36.7%) were 25 to 34 years old, 1.87 million (20.2%) were 35 to 44 years old, and 1.30 million (14.1%) were older than 45 years (see Table 1).

This survey conducted a planned sample determined the number of

respondents in each cell needed. The planned sample structure included 234 (46.8%) men and 266 (53.2%) women. Regarding age, our designed sample contained 26 who that were 13 to 17 years old (5.2%), 119 who were 18 to 24 years-old (23.8%), 184 who were 25 to 34 years-old (36.7%), 101 who were 35 to 44 years-old (20.2%), and 70 who were older than 45 years-old (14.1%).

This survey collected 500 useable questionnaires, classified from gender and/or age as of February and March 2022. As shown in Table 1, there were 232 men (46.4%) and 268 women (53.6%). Among the actual participants, 26 were 13 to 17 years-old (5.2%), 135 were 18 to 24 years-old (27.0%), 178 were 25 to 34 years-old (35.6%), 91 were 35 to 44 years-old (18.2%), and 70 were larger than 45 years-old (14%). As to the problem of non-response error, for online questionnaires, it is impossible to estimate the size of the rejection rate because it is not allowed to understand the number of non-respondents. Therefore, we compare the frequency of planned samples based on the population and the actual samples. As shown in the Table 1, it can be seen that the difference between the planned sample size and the actual sample size is quite small, and the problem of non-response error should not be serious. As to social-desirability bias that is a response bias in the self-reported survey. It may be occurred with the style of over- or under- reporting to form their good, bad, or undesirable behavior. We use the anonymous survey administration and personal data and response confidentiality to handle the social-desirability issue. Since that they can enhance response by adding trust, or decline response by enlarging suspicion (Krumpal, 2013).

This study employed one-way ANOVA to check whether respondents' demographic features influenced the online brand trust. The p-value is 0.056 (gender) and 0.092 (age), respectively ($p > 0.05$), a lack of statistical significance; online brand trust was not influenced by gender or age.

4. Empirical result and testing of the hypotheses

4.1 Reliability and validity analysis

We computed the average variance extracted (AVE), composite reliability

Table 1
Population, planned sample structure, and 500 empirical samples

Demographics characteristics of population	Items	Population	Percent
Gender	Male	4,321,758	46.7
	Female	4,932,542	53.3
Age	13-17 years-old	481,224	5.2
	18-24 years-old	2,202,523	23.8
	25-34 years-old	3,396,328	36.7
	35-44 years-old	1,869,369	20.2
	Over 55 years old	1,304,856	14.1
Total	---	9,254,300	100.0
Planned sample structure	Male	Female	Total
13-17 years-old	12 (2.4%)	14 (2.8%)	26 (5.2%)
18-24 years-old	56 (11.2%)	63 (12.6%)	119 (23.8%)
25-34 years-old	86 (17.2%)	98 (19.5%)	184 (36.7%)
35-44 years-old	47 (9.4%)	54 (10.8%)	101 (20.2%)
Over 55 years old	33 (6.6%)	37 (7.5%)	70 (14.1%)
Total	234 (46.8%)	266 (53.2)	500 (100.0%)
Actual Samples	Male	Female	Total
13-17 years-old	12 (2.4%)	14 (2.8%)	26 (5.2%)
18-24 years-old	62 (12.4%)	73 (14.6%)	135 (27.0%)
25-34 years-old	83 (16.6%)	95 (19.0%)	178 (35.6%)
35-44 years-old	43 (8.6%)	48 (9.6%)	91 (18.2%)
Oveer 55 years old	32 (6.4%)	38 (7.6%)	70 (14.1%)
Total	232 (46.4%)	268 (53.6%)	500 (100.0%)

(CR), and Cronbach's alpha for all constructs to examine reliability and validity. This study used Hair et al. (2010) proposed threshold magnitude to convergent validity, that is: (a) factor loading is larger than 0.70, (b) reliability value is larger than 0.70, and (b) AVE value is larger than 0.50. Table 2 lists that factor loading and reliability value are larger than 0.70, and AVE value is larger than 0.50. Thus, convergent validity was hold. For each dimension, the square root of the AVE is larger than the correlation (ρ^2) within dimensions, and holding discriminant validity (Table 2).

Table 2
Reliability analysis of each construct

Variables	Constructs	Loading	Error term	Cronbach's α	CR	AVE	(ρ^2)
Official Website Message (OWM)	Entertainment	0.867	0.014	0.905	0.909	0.715	0.498
	Customization	0.926	0.011				
	Interaction	0.811	0.019				
	Trendiness	0.770	0.019				
Electronic Word-of-Mouth (E-WOM)	Ewom Quantity	0.734	0.026	0.806	0.809	0.856	0.339
	Ewom Credibility	0.815	0.029				
	Ewom Quality	0.745	0.025				
Internet Celebrity Endorsement (ICE)	Attractiveness	0.881	0.017	0.908	0.911	0.773	0.590
	Trustworthiness	0.919	0.015				
	Expertise	0.836	0.017				
Brand Image (BI)	Functional Image	0.888	0.010	0.928	0.928	0.812	0.661
	Affective Image	0.932	0.008				
	Reputation Image	0.882	0.012				
Brand Familiarity (BF)	Informational Familiarity	0.883	0.021	0.839	0.851	0.741	0.672
	Self-rated Familiarity	0.838	0.031				
Online Brand Trust (OBT)	Brand Intentions	0.918	0.011	0.916	0.916	0.846	0.578
	Brand Reliability	0.921	0.011				

Note: CR = (sum of standardized loading)²/[(sum of standardized loading)² + (sum of measurement error)]; AVE= (sum of square standardized loadings²)/[(sum of square standardized loadings²) + (sum of measurement error)]; (ρ^2) = the square of the phi-coefficient for that pair, and all the inner construct correlations.

This study employed Harman's single-factor test to examine common method variance (CMV)(Podsakoff *et al.*, 2003). While a single factor explains most of the covariance, CMV is exposed. Empirical results showed that the variance enlighten from the first factor was 29.3% (smaller than 50%), verifying that CMV is probably not to influence the given finding. In practice, this work uses a cover picture at intervals within criterion and explanatory variables to avoid or lessen the hazard false relationships within criterion and explanatory variables

in order to handle CMV issue. This work also uses a common latent factor (CLF) method to further verify the CMV and a novel latent variable, CLF, is used when we adopt CLF method (Aguirre-Urreta and Hu, 2019; Fuller *et al.*, 2016). The particular path is determined as equal, and the variance of CLF is set to 1. The CLF approach integrate latent factors and potential relations into the method, so and the derived CLF coefficient means CMV magnitude (Tehseen *et al.*, 2017). We calculate that the derived CLF coefficient is 0.371, that is not larger than 0.50; it shows that CMV issue was trivial.

4.2 Results of structural equations modeling

In this work, the results are: $\chi^2/df = 3.478$, CFI = 0.965, NFI = 0.952, NFI = 0.952, GFI = 0.918, AGFI = 0.883, SRMR = 0.027 and RMSEA = 0.070, thus reflecting satisfactory model fit.

The results indicated in Table 3 show that H1–H8 are accepted. In H1, social media message affects higher brand image, bringing a strong effect ($\beta_1 = 0.256$, $t = 4.007$, $p < 0.001$). In H2, social media message positively affects brand familiarity, which was found to be moderate in strength ($\beta_2 = 0.333$, $t = 2.883$, $p < 0.001$). For H3, electronic-word-of-mouth affects higher brand image, bringing a strong effect ($\beta_3 = 0.235$, $t = 2.687$, $p < 0.001$). For H4, the effect of electronic-word-of-mouth on brand familiarity is strong ($\beta_4 = 0.68$, $p < 0.001$). As to H5, internet celebrity endorsement affects higher brand image, bringing a strong effect ($\beta_5 = 0.415$, $t = 9.150$, $p < 0.001$). As to H6, the effect of internet celebrity endorsement on brand familiarity is strong ($\beta_6 = 0.321$, $t = 4.038$, $p < 0.001$). Again, in H7 and H8 shows that brand image ($\beta_7 = 0.696$, $t = 14.323$, $p < 0.001$) and brand familiarity ($\beta_8 = 0.293$, $t = 8.528$, $p < 0.001$) positively and strongly influences online brand trust, respectively (see Table 3).

Additionally, the variance inflation factor (VIF) magnitude spreads over 1.914 and 2.545 that is not larger than 3, means that multicollinearity issue does not work (Hair *et al.*, 2019). The coefficient of determination (R^2) spreads over 0.400 and 0.665 that means a forceful explanatory power in the model given that R^2 was accounted for 0.02, 0.13, and 0.26 as little, medium, or huge magnitudes,

respectively (Hair *et al.*, 2019). This study computed that effect sizes (f^2), $f^2 = [R^2 / (1 - R^2)]$, spreads over 0.667 and 1.985, that means medium and large effects. Owing to 0.02, 0.15, and 0.35 represented the little, medium, and huge effects of assessing relations closeness within different variables (Hair *et al.*, 2019) (see Table 3).

Table 3
Results of research hypothesis (SEM) and direct and indirect effects of different paths

Hypothesized path	Coefficient	T-value	VIF	R ²	f ²
H ₁ : OWM → Brand Image	β ₁ = 0.256	4.007***	2.302	0.495	0.980
H ₂ : OWM → Brand Familiarity	β ₂ = 0.333	2.883***	2.302	0.400	0.667
H ₃ : E-WOM → Brand Image	β ₃ = 0.235	2.687***	2.545	0.471	0.890
H ₄ : E-WOM → Brand Familiarity	β ₄ = 0.591	3.656***	2.545	0.402	0.672
H ₅ : ICE → Brand Image	β ₅ = 0.415	9.150***	2.020	0.576	1.358
H ₆ : ICE → Brand Familiarity	β ₆ = 0.321	4.038***	2.020	0.397	0.658
H ₇ : Brand Image → Online Brand Trust	β ₇ = 0.696	14.323***	1.914	0.665	1.985
H ₈ : Brand Familiarity → Online Brand Trust	β ₈ = 0.293	8.528***	1.914	0.532	1.137

Path	Direct effect	Indirect effect	Total effect	Ranking	Aggregation
OWM→OBT					
OWM → BI → OBT	0	0.525*0.696	0.1782	2	0.2758
OWM → BF → OBT	0	0.333*0.293	0.0976	5	
E-WOM→OBT					
E-WOM → BI → OBT	0	0.235*0.696	0.1636	4	0.3368
E-WOM → BF → OBT	0	0.591*0.293	0.1732	3	
ICE→OBT					
ICE → BI → OBT	0	0.415*0.696	0.2888	1	0.3829
ICE → BF → OBT	0	0.321*0.293	0.0941	6	

Note: Based on one-tailed test: for t-value greater than 1.96 of 0.05 significant level (*); for t-value greater than 2.33 of 0.00 significant level (**); for t-value greater than 2.58 of 0.001 significant level (***)

χ² /df = 3.478, GFI = 0.918, AGFI = 0.883, CFI = 0.965, RFI = 0.939, NFI = 0.952, RMSR = 0.027, and RMSEA = 0.070. OWM is official website message, E-WOM is electronic word-of-mouth, ICE is internet celebrity endorsement, BI is brand image, BF is brand familiarity, and OBT is online brand trust.

4.3 Mediating effect analysis

This work adopts the Bootstrap method proposed from Lau and Cheung (2012) to assess the mediating effect. In case 1a and 1b (official website message—online brand trust), the confidence interval (CI)(0.260-0.663) for indirect effects do not include zero, and owns an obvious result ($p < 0.05$). The CI (0.080-0.805) of the direct effect do not include 0, showing that the direct effect is obvious ($p < 0.05$). This finding shows that brand image and brand familiarity owns a partially mediating effect between official website message and online brand trust. In case 2a and 2b (electronic-word-of-mouth—online brand trust), the CI (0.150-0.849) for indirect effects do not include 0, and owns an obvious result ($p < 0.05$). The CI (-0.540-0.274) of direct effect do not include 0, showing that ~~the~~ direct effect is obvious. It indicates that brand image and brand familiarity own a partially mediating effect between electronic-word-of-mouth and online brand trust. In case 3a and 3b (internet celebrity endorsement—online brand trust) owns a partially mediating effect, too. Therefore, hypothesis 9 is hold (see Table 4).

4.4 Empirical analysis of separate different perceived differentiation to online brand trust

ANOVA indicated that people from different perceived differentiations may have different types of online brand trust ($F = 21.505$, $p = 0.000$); therefore, this study employed perceived differentiation as a moderator in the study. This study divided the sample into two perceived differentiation groups initially: The first group contained high perceived differentiation, and the second group included low perceived differentiation. Then, this study adopted the chi-square difference examination to execute a model comparison within sub-groups. The results showed that the chi-square for the two groups was 269.754 and 239.426, and the DF (degrees of freedom) was 108 (chi-square difference = 30.328); their DF difference is not larger than 1. Therefore, perceived differentiation owned shown a moderator variable ($30.328 \geq 3.84$). Moreover, we examined which path-perceived differentiation had a notable effect.

Table 4
Empirical result of serial mediation effects

Case 1a	Contents	Estimate	p-value	Confidence interval
Indirect effect	OWM → BI → OBT	0.557	0.001/0.001	0.459~0.663/0.461~0.666
direct effect	OWM → BI	0.745	0.001/0.001	0.674~0.805/0.673~0.804
	BI → OBT	0.747	0.001/0.001	0.635~0.851/0.640~0.855
	OWM → OBT	0.190	0.002/0.003	0.080~0.312/0.074~0.303
Total effect	OWM → OBT	0.746	0.001/0.001	0.679~0.804/0.678~0.803
Case 1b	contents	estimate	p-value	Confidence interval
Indirect effect	OWM → BF → OBT	0.421	0.002/0.001	0.26~0.577/0.273~0.593
direct effect	OWM → BF	0.709	0.001/0.001	0.619~0.788/0.620~0.789
	BF → OBT	0.593	0.002/0.001	0.410~0.765/0.422~0.782
	OWM → OBT	0.326	0.001/0.002	0.147~0.509/0.132~0.490
Total effect	OWM → OBT	0.747	0.001/0.001	0.680~0.803/0.680~0.802
Case 2a	contents	estimate	p-value	Confidence interval
Indirect effect	E-WOM → BI → OBT	0.520	0.001/0.001	0.410~0.640/0.411~0.643
direct effect	E-WOM → BI	0.790	0.001/0.001	0.724~0.849/0.728~0.852
	BI → OBT	0.658	0.001/0.001	0.530~0.781/0.533~0.785
	E-WOM → OBT	0.291	0.001/0.001	0.150~0.429/0.146~0.423
Total effect	E-WOM → OBT	0.811	0.001/0.001	0.749~0.863/0.751~0.865
Case 2b	contents	estimate	p-value	Confidence interval
Indirect effect	E-WOM → BF → OBT	0.372	0.002/0.001	0.214~0.569/0.219~0.579
direct effect	EWOM → BF	0.759	0.002/0.001	0.649~0.830/0.658~0.834
	BF → OBT	0.491	0.002/0.001	0.306~0.704/0.316~0.716
	E-WOM → OBT	0.438	0.001/0.001	0.205~0.621/0.195~0.613
Total effect	E-WOM → OBT	0.810	0.001/0.001	0.747~0.863/0.747~0.863
Case 3a	contents	estimate	p-value	Confidence interval
Indirect effect	ICE → BI → OBT	0.561	0.001/0.001	0.444~0.707/0.440~0.703
direct effect	ICE → BI	0.822	0.001/0.001	0.759~0.870/0.759~0.872
	BI → OBT	0.683	0.001/0.001	0.536~0.829/0.540~0.832
	ICE → OBT	0.251	0.003/0.003	0.095~0.396/0.094~0.396
Total effect	ICE → OBT	0.812	0.001/0.001	0.751~0.864/0.752~0.864
Case 3b	contents	estimate	p-value	Confidence interval
Indirect effect	ICE → BF → OBT	0.351	0.002/0.001	0.215~0.487/0.222~0.499
direct effect	ICE → BF	0.706	0.001/0.001	0.603~0.787/0.608~0.788
	BF → OBT	0.497	0.002/0.001	0.333~0.650/0.343~0.662
	ICE → OBT	0.462	0.001/0.001	0.298~0.623/0.288~0.612
Total effect	ICE → OBT	0.814	0.001/0.001	0.750~0.866/0.752~0.867

Note: OWM is official website message, E-WOM is electronic-word-of-mouth, ICE is internet celebrity endorsement, BI is brand image, BF is brand familiarity, and OBT is online brand trust.

This study found that electronic word-of-mouth influenced brand image and brand familiarity significantly in the lower perceived differentiation group ($p =$

0.005 and 0.001) but did not influence it significantly in the higher perceived differentiation group ($p = 0.277$ and 0.333). However, brand image and brand familiarity had an obvious and favorable impact on online brand trust, whether in the lower or higher group ($p < 0.05$).

Furthermore, this study examined the interference effect of high/low perceived differentiation on brand image and online brand trust using regression analysis. First, in order to centralize and avoid the collinearity problem, this study took brand image as the independent variable, standardizing the variables, and converting brand image and high/low perceived differentiation into the Z score. Then, this study viewed online brand trust as a dependent variable to produce a regression model. The results showed that the brand image and perceived

Table 5
Model comparison between groups (T-value & P-value)

Hypothesis	The Lower Perceived Differentiation			The Higher Perceived Differentiation		
	Estimate	T-value	P-value	Estimate	T-value	P-value
H ₁ : Official Website Message → Brand Image	0.125	1.426	0.154	0.242	2.377	0.017**
H ₂ : Official Website Message → Brand Familiarity	0.195	1.127	0.260	0.258	1.453	0.146
H ₃ : Electronic Word-of-Mouth → Brand Image	0.261	2.784	0.005***	0.191	1.088	0.277
H ₄ : Electronic Word-of-Mouth → Brand Familiarity	0.601	3.217	0.001***	0.694	2.128	0.033
H ₅ : Internet Celebrity Endorsement → Brand Image	0.452	8.887	0.000***	0.368	3.949	0.000***
H ₆ : Internet Celebrity Endorsement → Brand Familiarity	0.343	3.684	0.000***	0.198	1.228	0.219
H ₇ : Brand Image → Online Brand Trust	0.660	9.974	0.000***	0.718	8.559	0.000***
H ₈ : Brand Familiarity → Online Brand Trust	0.286	6.261	0.000***	0.301	5.064	0.000***

Based on one-tailed test: for t-value greater than 1.96 or smaller than -1.96 (*); for t-value greater than 2.33 or smaller than -2.33(**); for t-value greater than 2.58 or smaller than -2.58(***)

Notes: Lower: $\chi^2/df=269.754/108=2.498$, GFI=0.896, AGFI=0.852, CFI=0.961, NFI=0.936, IFI=0.961, RMSEA=0.073, RMSR=0.024.

Higher: $\chi^2/df=239.426/108=2.217$, GFI=0.887, AGFI=0.839, CFI=0.941, NFI=0.899, IFI=0.942, RMSEA=0.075, RMSR=0.037.

differentiation in Model 3 have a positive influence on online brand trust. The coefficient is 0.144, and the t-value is 4.523, reaching a significant level. In Model 4, the coefficient is 0.159, and the t-value is 4.916, which is at a significant level, verifying the hypothesis that high/low perceived differentiation impacts the influence of brand image on followers' online brand trust.

Similarly, this study examined the interference effect of high/low perceived differentiation on brand familiarity and online brand trust with regression analysis. The results showed that brand familiarity and high and low perceived differentiation in Model 7 had a positive influence on online brand trust ($t = 7.997$). Model 8 also verified the hypothesis that high and low perceived differentiation impact the influence of brand familiarity on followers' online brand trust ($t = 8.614$). Therefore, hypotheses 10(a) and 10(b) were supported (see Tables 6(a) and 6(b)).

5. Conclusions

5.1 Research conclusion

Firstly, this study successfully used a sub-collection of brand knowledge (brand image and brand familiarity) as mediation variables to examine the relationship between POE (PEM, OSM, and ESM) strategies and online brand trust. In the social media marketing activities, this study can provide value through this mediation lens (Aw and Labrecque, 2020; Ladkoo and Ismael, 2018; Yu and Hu, 2020). Secondly, the moderator perceived differentiation in this study obviously has a moderation effect through brand image to online line brand trust, and through brand familiarity to online brand trust.

Moreover, this study provided new evidence of cognitive information processing mechanism and described the link between social media marketing activities and online brand trust. With three types of social media marketing activities (PEM, OSM, and ESM), consumers' brand knowledge (brand image and brand familiarity) owned a significant influence on their online brand trust. The most effective path to online brand trust was internet celebrity endorsement (PSM).

Table 6
Multiple regression analysis of the interaction effect of brand image/brand familiarity and high/low perceived differentiation on online brand trust

(a) Brand image

Research Variable	Brand image			
	Demographic Variable (Model 1)	Independent (Model 2)	Moderating (Model 3)	Interaction (Model 4)
Control:				
Gender	0.086 (1.915)	0.039 (1.482)	0.035 (1.379)	0.032 (1.269)
Age	-0.003 (-0.062)	-0.003 (-0.111)	0.009 (0.348)	0.014 (0.533)
Independent:				
Brand image		0.812 (31.299) ***	0.727 (22.861) ***	0.721 (22.701) ***
Moderator:				
High/Low perceived differentiation			0.144 (4.523) ***	0.159 (4.916) ***
Interaction:				
Brand image X High/Low perceived differentiation				-0.063 (-2.422) **
R ²	0.007	0.666	0.680	0.683
Adj- R ²	0.007	0.659	0.013	0.004
F	1.832	979.638***	20.457***	5.868***

Note: The number in parentheses are t-value; *p<0.05, **p<0.01, ***p<0.001.

(b) Brand familiarity

Research Variable	Brand familiarity			
	Demographic Variable (Model 5)	Independent (Model 6)	Moderating (Model 7)	Interaction (Model 8)
Control:				
Gender	0.086 (1.915)	0.036 (1.161)	0.030 (1.027)	0.028 (0.965)
Age	-0.003 (-0.062)	0.012 (0.387)	0.031 (1.077)	0.037 (1.287)
Independent:				
Brand familiarity		0.727 (23.647) ***	0.584 (17.148) ***	0.567 (16.581) ***
Moderator:				
High/Low perceived differentiation			0.273 (7.997) ***	0.305 (8.614) ***
Interaction:				
Brand familiarity X High/Low perceived differentiation				-0.092 (-3.080) ***
R ²	0.007	0.533	0.587	0.595
Adj- R ²	0.007	0.526	0.534	0.587
F	1.835	559.198***	63.952***	9.486***

Note: The number in parentheses are t-value; *p<0.05, **p<0.01, ***p<0.001.

This path had the highest aggregation value ($0.2888 + 0.0941 = 0.3829$). We found that the PSM→BI→OBT path was the highest route of increasing online brand trust ($0.415 \times 0.696 = 0.2888$); for example, reminding a better brand image or

evoking a brand name in the consumer memory through paid social media was relatively easy. Because internet celebrity endorsers can build up relationships with brands and customers, this association reminds customers to regard the brand with a better image through the image of internet celebrities themselves embodied in products. This can help the company enhance customer trust in online shopping.

The second effective path in this study was electronic word-of-mouth (ESM), which had an aggregation value of 0.3368 (0.1636 + 0.1732). Sound electronic word-of-mouth could provide better brand image and familiarity to customers and could eventually enhance online brand trust. Consumers can provide their own self-images based on the information they receive, and they are more likely to accept information acquired from friends (Pihlaja *et al.*, 2017). This could make the information trustworthy and further build online brand trust.

5.2 Managerial implications

Based on the marketing viewpoint, given the most effective path of this study, which is internet celebrity endorsement to online brand trust through brand knowledge. Due to this, internet celebrities from Instagram obviously affect the willing of trust through online shopping. Social media manager can use paid social media while performs the marketing activity through social platform: Instagram to promote their brand. This promoting strategy can combine with the marketing text in manager's post and, it also videos to explain the brand and its function. Viewers must find the accurate internet celebrity that meets the professional image and appeal according to the product. Since the credibility of internet celebrities transferred to the endorsed brand and further to customers. Brand manager can examine the internet celebrities through their usual advertising or endorsement campaigns to see if they have compatible image. Therefore, the social media manager can select appropriate internet celebrities to express correct and professional images to customers through their endorsed product, and further results in online brand trust to enhance purchase action.

Social media manager must use the impact of internet celebrity endorsement more individually and in depth to inform target consumers (Ibrahim *et al.*, 2021;

Lim *et al.*, 2022). This verifies an obvious informing effect. Internet celebrity endorsement notifies and deepens the impression of audiences through effective information-processing procedures. For social media manager, the informing function of internet celebrity endorsement especially worked for intensive consumers. By carefully selecting professional and attractive internet celebrities to create a favorable brand image, brand manager can consider the similarity and self-disclosure between internet celebrities and their audiences. Brand manager create personal brand familiarity through quasi-social interactions. Marketers then use a two-pronged approach to build online brand trust (Wang, 2021; Wang and Liu, 2022).

A better electronic word-of-mouth is an approach to earn an online brand trust since social networks can spread electronic WOM widely and quickly (Kimmel and Kitchen, 2014). This verifies an enhance amusement effect. Empirical results examine electronic WOM plays a secondary path to obtain online brand trust. Therefore, electronic WOM owns a capability to promote excitement obviously. Social media manager can operate electronic WOM by running a fan page, encouraging positive feedback from customers, and punching in to upload. This then promote a friendly atmosphere and amusement to produce online brand trust.

Additionally, for official website message, the effect on brand trust is the lowest because it is not easy for viewers to believe in the authenticity of this type of information of standard publicity. This verifies a limited reminding effect. This operation merely strengthens the audience's short-term memory and generates brand image and brand familiarity. Thus, this remind effect in opening potential consumers and market opportunity is limited.

Note that from the point of view of viewers, while browsing or viewing some items based on their own followed internet celebrity, fans pages or recommendation through Instagram, viewers are more likely to have more trust on things endorsed by celebrities. However, not only celebrities but also those who have relevant buying experiences are trustworthiness. When next time viewers are going to conduct an online purchase intention, the celebrities or recommendations

from their friends or reviews maybe could give a hint and result in online brand trust.

5.3 Research limitations and future research

Based on the results of this research, we draw valuable implications for not only academic areas but also the marketing field. Nevertheless, this study has several limitations. As for the sample structure, this study used 500 samples due to budget constraints. With a large enough budget, 1000 to 1200 questionnaires could effectively decrease the bias and be more precise. The larger the sample collected, the better and more effective the representation. Moreover, researchers could also collect data from several countries, as the situation may be completely different. Different countries have their own cultures and cognitive behaviors; perhaps scholars could conduct cross-cultural research. The product in this study is clothing products; future research could choose other specific products. Finally, this study focused on the target audience who use the Instagram social platform; thus, this study examined only behavior on Instagram and individuals from Taiwan. This could be another limitation, future research can adopt other social media (e.g., Facebook or YouTube) to examine different platform situations.

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