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Research Note

Big Star Undercover: The Reinforcing Effect of Attenuated Celebrity Endorsers' Faces on Consumers' Brand Memory

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This study examines how a disfluent celebrity endorser's face affects the level of consumer engagement with brand name in the advertisement. Focusing on metacognition theories, results from three experiments and one eye-tracking experiment suggest that as compared with a clear version of celebrity endorser's face, a blurred or partly covered version will enhance consumers' brand recall. This study also shows that the reinforcing effect of a disfluent celebrity's face on brand memory recall is mediated by consumer engagement with the advertisement and moderated by celebrity identification.

Marketers have long believed that celebrity endorsements help sell products. However, the relationship between celebrity endorsement and brand recall is still not confirmed, as a recent meta-analysis revealed that the average effect of celebrity endorsement on brand recall is close to zero (Knoll and Matthes 2017). Although previous literature indicates that celebrities' faces capture a disproportionate amount of attention because they are generally attractive (Felix and Borges 2014) and trigger affective feelings (Anderson, Siegel, and Barrett 2011), this does not necessarily mean that the captured attention will spill over into the marketing communication information (such as products, brands, and logos). In fact, it is a common concern that consumers will focus their attention on the celebrity and fail to notice the

brand being promoted (Erdogan 1999, p. 296). For example, Erfgen, Zenker, and Sattler (2015) analyzed the existence of the celebrity eclipsing effect and found that celebrities might indeed overshadow an endorsed object.

Very little research appears to have been undertaken to explore the possible measures to influence viewers' attention toward the brand in endorsement advertisements. To fill this gap, we manipulate the fluent/disfluent experience of a celebrity endorser's face in advertising contexts and investigate how such experiences affect brand recall. Fluency is defined as "conscious experience of processing ease" (Winkielman et al. 2003, p. 5). A celebrity's face is considered to be a highly fluent stimulus for two reasons. First, in comparison with nonfacial stimuli, facial processing has a faster processing speed and higher accuracy (Johnson 2005). In fact, face processing was found to be automatic and would not distract participants' attention when they were asked to search for a target nonfacial object (Langton et al. 2008). Second, celebrities have more accessible representations in memory as compared with unknown persons (Erfgen, Zenker, and Sattler 2015). In this study, we found that a disfluent celebrity image (such as covering, blurring, or showing only part of the face), instead of a fluent one, can increase engagement (visually and cognitively) on endorsement advertisement and brand memory. We demonstrate this effect in three experiments and one eye-tracking experiment. We also illustrate that the mechanism underlying the disfluency effect might be enhanced visual attention to and engagement with the advertisement. Furthermore, we show the boundary condition of such an effect: that when viewers experience only a moderate level of disfluency (i.e., when they can still recognize the celebrity), they will pay more attention to the advertisement and have better

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brand memory in a disfluency condition rather than in an uncovered face condition.

RESEARCH BACKGROUND

Metacognitive Experience and Consumer Engagement

Consumers' metacognitive experiences, such as ease of information processing (i.e., fluency), can influence human judgment (Labroo and Pocheptsova 2016). Research in psychology and marketing supports that fluency is generally associated with positive affect and brand evaluation (for a review, see Winkielman et al. 2003). While fluency increases positive affect, it may also dampen engagement and interest by reducing uncertainty about a stimulus (Lee 2001; Jiang and Hong 2014). These results offer possible explanations for the discrepancy of previous research findings regarding celebrity endorsement and brand recall (Knoll and Matthes 2017). Marketers typically strive to offer consumers easy-to-process information (e.g., a celebrity's face) in their advertisements. However, such highly familiar information could also lead consumers to be less interested in processing new information (e.g. the endorsed brand), which will reduce their performance in brand recall.

In this research, we propose that when a moderate level of disfluency is introduced for a celebrity's face, consumers are more likely to remember the endorsed brand. During the past decade, researchers have shown that disfluency could be beneficial because it deepens and broadens thinking and dampens stereotyping (Pocheptsova, Labroo, and Dhar 2010). When consumers experience metacognitive difficulty, they should be motivated to consider any available information to restore a sense of understanding (Lee and Shavitt 2009). Consumers tend to use analytic and deliberate processing when information is processed disfluently (Alter et al. 2007; Alter 2013). Thus, the disfluency of the celebrity endorser's face may lead to more engagement and better understanding of the advertising information (Labroo and Pocheptsova 2016), which will result in better performance in brand memory. Consistent with the previous discussion, we propose the following:

> **H1:** (a) Brand recall and (b) brand recognition are higher when the endorsement advertisement contains a disfluent (blurred or partly covered) face than when it contains an uncovered face of the same endorser.

Drawing on these discussions, it is proposed that the disfluent celebrity image can increase consumers' interest in the endorsement advertisement. Previous research reveals that interest consists of two key components: novelty (i.e., factors related to unfamiliarity and complexity) and coping potential (i.e., the ability to understand a new, complex thing) (Silvia

2005). A novelty check includes a family of appraisals, such as whether people evaluate something as new, uncertain, mysterious, or unexpected. Thus, disfluent experience is capable of triggering the emotion of interest. However, the disfluent experience is not the only factor relevant to interest. Many studies have found an inverted-U relationship between novelty variables and interest (Walker, 1981). Silvia (2005) argues that coping potential is the second appraisal component. It refers to consumers' appraisals of the likelihood that they can understand the ambiguous event. For example, experts rated abstract art as more interesting when they can understand it better (Millis, 2001).

A celebrity endorsement advertisement, by its nature, is an advertisement in which the advertiser includes something that is believed to be inherently involving and arousing to a significant portion of the target audience. Consumers also expect congruity between celebrity endorsers' perceived images and the products they endorse (Ohanian 1991). When a consumer's perceived understanding is threatened by the experience of metacognitive difficulty, he or she will be motivated to restore sense of understanding and therefore may be more willing to seek any available information about the advertisement (Lee and Shavitt 2009). Thus, the likelihood of recognition of disfluent famous faces should be positively related to the advertisements' coping potential. We propose that when perceived understanding is reduced due to celebrity face disfluency, consumers who can still identify the celebrity should be more motivated to seek brand information to reestablish their sense of understanding. Conversely, when consumers cannot identify the celebrity, they should not be especially motivated to seek new information because of the low coping potential. Therefore, a disfluent celebrity face tends to attract more interest when it can be identified than when it cannot, which enhances consumer engagement with the advertisement. Hence, in this study, we propose as follows:

> **H2:** Celebrity identification moderates the relationship between face conditions and engagement with an advertisement such that the relationship is stronger for consumers who can identify the celebrity versus those who cannot.

> **H3:** The indirect effect of face conditions on (a) brand recall and (b) brand recognition through engagement with an advertisement is moderated by celebrity identification such that the indirect effect exists only when the celebrity endorser is identified.

STUDY 1: THE REINFORCING EFFECT

Study 1a
Methods

In this study, a two-conditions between-subjects design (face condition: uncovered versus partly covered) was

(a)   (b)

FIG. 1. Heat map in Study 1b: (a) partly covered face condition; (b) uncovered face condition.

used to assess the occurrence of a reinforcing effect of disfluent celebrity face (hypothesis 1). Yifei Liu was chosen as our celebrity endorser because of her status as one of the most famous actresses in China. A professionally designed advertisement for a skin care product (Garnier) was used that showed Liu as the celebrity endorser. A context-relevant object was applied to the advertisement image to partly cover Liu's face—specifically, a Chinese fan was added to block the lower part of her face in the partly covered face condition (see appendix).

A total of 171 participants completed the online survey (58 males, $M_{age} = 28.9$ years, 75.4% had a bachelor's degree or higher) on a popular online survey platform in China (Sojump) in early 2018. These individuals were randomly assigned to one of the two experimental conditions (i.e., uncovered face and partly covered face). In this study, the cover story informed participants that they were participating in a test of new advertisements. The advertising stimulus was available on the screen for five seconds. Participants were subsequently asked to solve four mental math exercises involving basic arithmetic operations to distract from the advertisement (Erfgen, Zenker, and Sattler 2015). After that, they were asked whether they were able to recognize the celebrity endorser and to provide a rating for the attractiveness of the endorser. Then, they were instructed to respond to a surprise brand name recall task and a brand recognition task on the next page.

Study 1a Results and Discussion

Chi-square tests of independence were performed to examine the relation between experiment conditions and brand recall or brand recognition. The relation between the experiment conditions and brand recall was found to be significant (χ^2 (1, $N = 266$) = 5.40, $p < .05$). It was found that if the participants recognized the celebrity, they were more likely to remember the brand's name in the partly covered face condition (67.6%) than in the uncovered face condition (46.2%; χ^2 (1, $N = 99$) = 4.17,

$p < .05$). In contrast, if the participants did not recognize the celebrity, no significant difference was found between the two conditions. Hypothesis 1a is therefore supported. Meanwhile, the chi-square test also indicated that there was a significant relationship between conditions and brand recognition (χ^2 (1, $N = 266$) = 6.23, $p < .05$). However, results reveal that brand recognition in the partly covered face condition is not significantly higher than in the uncovered face condition. Hypothesis 1b was therefore not supported.

Study 1b
Methods

Study 1b used a two-condition between-subjects design (face condition: uncovered versus partly covered) as was used in study 1a. A total of 30 undergraduate students from a university in Macau completed Study 1b in early 2018 in exchange for course credit. They were randomly assigned to either the uncovered face condition or partly covered face condition. Participants were told that they would be viewing advertisements using an eye tracker. A screen-based aSee Pro eye tracker (aSee Pro F90; 7Invensun Technology, Beijing, China) was used to collect data. Participants were not required to wear any additional devices to use the eye tracker. Instead, they simply had to look at the screen to complete the experiment. The eye tracker was discreetly mounted below the screen and used infrared cameras to record the participant's gaze on the screen with a frequency of 60 Hz and an accuracy of 0.5 degrees of visual angle.

Participants viewed five pictures in the following order on the screen: two landscape photos, two filler advertisements (car and watch), and the target stimuli (an advertisement with an uncovered face or one with a partly covered face). The study used the same stimuli as used in Study 1a. After finishing the viewing task, the participants were asked whether they were able to recognize the

endorser in the stimuli. All of them were able to correctly identify Liu as the celebrity endorser.

Study 1b Results and Discussion

Figure 1 visually illustrates the reinforcing effect of a disfluent celebrity face, in that a partly covered face increases visual attention to other advertisement elements (i.e., brand name, product), which may lead to a higher degree of brand name recall afterward. In the partly covered face condition, the focal points of the red zones were clearly situated on or around the brand and product. In the uncovered face condition, the gaze data were principally focused on the face, which led to a considerable smaller proportion of visual attention going to the product and the brand.

To further analyze the data from the eye tracker, specific areas of interest (AOIs) were established around the celebrity's face, the brand, and the product. An identical set of AOIs was applied to the target stimulus in both conditions (Cian, Aradhna, and Elder 2014). As anticipated, a significant difference was found between the face conditions with regard to the total time of viewing ($M_{partly\ covered} = 12.66$ s versus $M_{uncovered} = 7.40$ s; F (1, 29) $= 8.40$, $p < .01$), the number of fixations ($M_{partly\ covered} = 14.87$ versus $M_{uncovered} = 5.87$; F (1, 29) $= 8.0$, $p < .01$), the duration of fixation on brand AOI ($M_{partly\ covered} = 2.82$ s versus $M_{uncovered} = 0.98$ s; F (1, 29) $= 6.54$, $p < .02$), and product AOI ($M_{partly\ covered} = 3.97$ s versus $M_{uncovered} = 2.17$ s; F (1, 29) $= 5.64$, $p < .03$), with the partly covered face condition leading to higher indexes than the uncovered face condition.

Because there was no difference in gaze frequency and duration for the AOI of the celebrity face, but there were significant differences in product AOI and brand AOI, it appeared that participants were attempting to use the product category and brand name to offer further clues for celebrity identification. Over the past two decades, several studies have suggested that endorsers were more effective if there was a fit between the endorser and the endorsed product (Misra and Beatty 1990; Till and Busler 2000; Wright 2016). Participants, therefore, may be predisposed to pay more attention to the brand name due to their prior experience with these endorsed advertisements, which increased their performance in brand recall. To explore this possibility, we analysed the eye-tracking data of saccades (movement from one AOI to another AOI) between the celebrity face AOI (left side of the advertisement; see Figure 1) and product/brand AOI (right side of the advertisement). A marginally significant difference was found between the face conditions in terms of number of saccades ($M_{partly\ covered} = 5.40$ versus $M_{uncovered} = 3.73$; F (1, 29) $= 3.98$, $p < .06$), with the partly covered face condition

having a higher number of eye movements between the celebrity face AOI and the product/brand AOI than the uncovered face condition. Such a result suggests that the disfluent celebrity image does elicit visual attention to seek novelty and enhance arousal.

STUDY 2: MODERATING ROLE OF CELEBRITY IDENTIFICATION

Methods

In Study 2, we developed a three-condition (uncovered face, covered face, covered face with identification cue) between-subjects design to test hypotheses 1a and 1b. Leehom Wang was chosen as the celebrity endorser in the stimuli. He is a pop singer whose his musical style is well-known by many Chinese consumers, yet his face might not be as famous as those of other types of celebrities, such as movie stars and sports stars. The present study used a real-world advertisement showing him as the celebrity endorser for a camera brand (i.e., Nikon). The method for the manipulation of Wong's face in this study was to use a camera to cover some of the features of the face (nose and mouth; see appendix).

In early 2019, 363 Chinese participants (144 males, $M_{age} = 29.3$ years, 82.4% had a bachelor's degree or higher) were recruited through the same online survey platform in China (Sojump) and assigned randomly to one of the three conditions. The cover story in this study informed participants that they were participating in a survey regarding the need for cognition. They were also informed that, to mimic the online environment, pictures and advertisements would be shown before the survey. Each of the pictures and advertisements was shown on the screen for five seconds. In the uncovered face condition and the covered face condition, a photo of scenery was shown before the advertising stimulus. In the covered face with identification cue (hereafter referred to as the identification cue) condition, the endorser's photo was shown with his name before the advertising stimulus. Participants were then asked to respond to an irrelevant personality survey with 18 items examining the need for cognition (Cacioppo, Petty, and Kao 1984), which took about two minutes to complete. After that, they were asked whether they could recognize the celebrity endorser in the advertisement before the survey and to write down his name if they knew it. Then, they were instructed to respond to a surprise brand name recall task and a brand recognition task on the next page.

Results and Discussion

A manipulation check was performed in Study 2 by using a chi-square test. In the covered face condition,

TABLE 1
Cell Counts, Adjusted Standardized Residuals, and p Values by Condition in Study 2

Brand Recall and Recognition	Condition		
	Covered Face	Uncovered Face	Covered Face With Identification Cue
Brand name recall[a]			
Correct	53.8% ($n = 70$)	47.3% ($n = 61$)	66.4% ($n = 67$)
Wrong	46.2% ($n = 60$)	52.7% ($n = 68$)	35.6% ($n = 37$)
Adjusted standardized residuals (Z score)	−0.2	−2.1	2.4
χ^2	0.04	4.41*	5.76*
p	0.841	0.036	0.016
Brand recognition[b]			
Correct	74.6% ($n = 97$)	73.6% ($n = 95$)	85.6% ($n = 89$)
Wrong	25.4% ($n = 33$)	26.4% ($n = 34$)	14.4% ($n = 15$)
Adjusted standardized residuals (Z score)	−1.0	−1.3	2.4
χ^2	1	1.69	5.76*
p	0.317	0.194	0.016
Total N	130	129	104

[a]Correct rate for total recall = 54.5%.
[b]Correct rate for total recognition = 77.4%.
*$p < .05$; **$p < .01$.

27.7% of participants could correctly identify Wang as the celebrity endorser, which is significantly lower than in the uncovered face condition (46.5%; χ^2 (1, $N = 259$) = 9.83, $p < .003$) and the identification cue condition (64.4%; χ^2 (1, $N = 234$) = 31.63, $p < .001$). The endorser identification rate was significantly higher in the identification cue condition (64.4%) than that in uncovered face condition (46.5%; χ^2 (1, $N = 233$) = 7.45, $p < .01$). Our manipulation of celebrity identification was therefore successful.

Chi-square tests of independence were performed to test the relation between celebrity identification and memory measurements. Results indicated the relationship was significant for both brand recall (χ^2 (1, $N = 363$) = 6.86, $p < .05$) and brand recognition (χ^2 (1, $N = 363$) = 5.59, $p < .05$). Results of a post hoc test (Table 1) reveal that brand recall in the identification cue condition (66.4%) was significantly higher than in the uncovered face condition (47.3%; χ^2 (1, $N = 233$) = 6.83, $p < .01$). Hypothesis 1a is therefore supported. Brand recognition in the identification cue condition (85.6%) was also significantly higher than in the uncovered face condition (73.6%; χ^2 (1, $N = 233$) = 4.94, $p < .05$). Hypothesis 1b is thus supported.

STUDY 3: MEDIATING ROLE OF ENGAGEMENT

Methods

Louis Koo was chosen as the celebrity endorser for Study 3 because he is one of the most well-known movie stars in China. The study used a professionally designed advertisement showing him as the celebrity endorser for a Chinese watch brand (Fiyta). In the blurred face condition, Koo's face was manipulated by changing the visual resolution of the face area using the Gaussian blur filter in Adobe Photoshop 6.2. An endorser's face was not presented in the control condition (see appendix).

In this study, the cover story informed participants that they were participating in a survey of personal characteristics. An advertisement would be shown before the survey. A total of 516 participants completed the online survey (250 males, $M_{age} = 32.0$ years, 59.9% had a bachelor's degree or higher). These individuals were randomly assigned to one of the three experimental conditions (i.e., clear face, blurred face, and control). The advertising stimulus was available on the screen for five seconds. The participants were not explicitly instructed to look at the advertisement for the whole five seconds. Participants next were asked to respond to an irrelevant personality survey (14 items of social curiosity; Renner 2006) for about one minute. After that, they were asked whether they could recognize the celebrity endorser present in the advertisement before the survey and to rate his attractiveness. Then, they were instructed to respond to a surprise brand name recall task and a brand recognition task on the next page. In addition, they were required to rate how much they were engaged with the advertisement by using the personal investment for advertisement measure (Campbell 1995; $\alpha = 0.77$).

Results and Discussion
Engagement With the Advertisement

A two-way analysis of variance (ANOVA) was performed with face conditions and celebrity identification as the independent variables. This analysis produced a main effect of the celebrity identification (F (1, 407) = 17.93, $p < .001$); participants rated their engagement with the advertisement as higher when they were able to identify the celebrity ($M = 5.09$) as compared with when they could not ($M = 4.66$). A significant interaction between face conditions and celebrity identification was also found (F (1, 407) = 4.82, $p < .03$), which offers empirical support for hypothesis 2. As shown in Figure 2, when Koo was correctly identified, participants reported greater
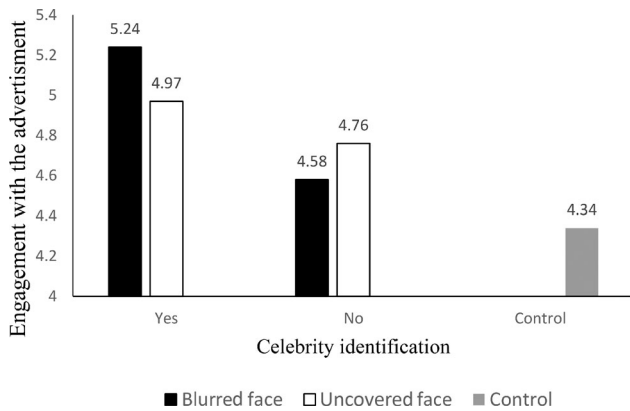

FIG. 2. Engagement with the advertisement in Study 3.

engagement with the advertisement in the blurred face condition ($M = 5.24$) than in the uncovered face condition ($M = 4.97$; F (1, 260) = 4.58, $p < .04$). In contrast, when Koo could not be identified, no significant difference was found between the two face conditions ($M_{blurred} = 4.58$ vs. $M_{uncovered} = 4.76$; F (1, 146) = 1.33, $p = .25$). Thus, hypothesis 2 is supported.

Memory Measures

Chi-square tests of independence were performed to test the results of memory measures. The relationship between the experiment conditions and brand recall was significant (χ^2 (1, $N = 516$) = 27.85, $p < .001$). Results of a post hoc test reveal that brand name recall in the blurred face condition (84.5%) was significantly higher than in the uncovered face condition (73.1%; χ^2 (1, $N = 261$) = 4.89, $p < .05$) when the celebrity could be recognized. Hypothesis 1a is thus supported. In addition, there was a significant relationship between conditions and brand recognition (χ^2 (1, $N = 516$) = 10.80, $p < .01$). However, results of a post hoc test reveal that no significant difference could be found for brand recognition among the two endorsed conditions. Hypothesis 1b was thus not supported (see Table 2).

Moderated Mediation

Bootstrap tests of moderated mediation (Model 7) (Preacher, Rucker, and Hayes 2007) were conducted to

TABLE 2
Cell Counts, Adjusted Standardized Residuals, and p Values by Condition in Study 3

Brand Recall and Recognition	Condition		
	Control	Uncovered Face	Blurred Face
Brand name recall[a]			
Correct	33.3% ($n = 36$)	59.0% ($n = 124$)	63.6% ($n = 126$)
Wrong	66.7% ($n = 72$)	41.0% ($n = 86$)	36.4% ($n = 72$)
Adjusted standardized residuals (Z score)	−5.2	1.4	3.0
χ^2	27.40***	1.96	9.00**
p	0.000	0.162	0.003
Brand recognition[b]			
Correct	55.6% ($n = 60$)	71.9% ($n = 151$)	72.2% ($n = 143$)
Wrong	44.4% ($n = 48$)	28.1% ($n = 59$)	27.8% ($n = 55$)
Adjusted standardized residuals (Z score)	−3.3	1.3	1.4
χ^2	10.89**	1.69	1.96
p	0.001	0.194	0.162
Total N	108	210	198

[a]Correct rate for total recall = 55.4%.
[b]Correct rate for total recognition = 68.6%.
*$p < .05$; **$p < .01$; ***$p < .001$.

assess hypotheses 2, 3a, and 3b, examining celebrity identification (1 = yes, 0 = no) as a moderator of the relationship between face condition (1 = blurred face, 0 = uncovered face) and engagement with the advertisement, with the brand recall (1 = right, 0 = wrong) being the dependent variable. Celebrity attractiveness, brand familiarity, age, gender (1 = male, 0 = female), and education were added as control variables.

The results reveal a significant interaction between face condition and celebrity identification on engagement with the advertisement ($\beta = 0.36$, $p < .05$) after controlling for brand familiarity ($\beta = 0.28$, $p < .001$) and endorser attractiveness ($\beta = 0.28$, $p < .001$), which offers further support for hypothesis 2. More importantly, the results confirm conditional indirect effects of the celebrity identification moderator on the engagement with advertisement mediator. When the participants can identify the celebrity, engagement with the advertisement mediated the relationship between face condition and brand recall; specifically, a positive indirect path was found (indirect effect = .12, SE = .07, 95% CI: [.004 to .27]). However, mediation by engagement with the advertisement is not supported if the celebrity cannot be identified (indirect effect = −.08, SE = .09, 95% CI: [−.28 to.08]). The results support hypothesis 3a. For brand recognition, similar results were found. A positive indirect path (indirect effect = .07, SE = .05, 95% CI: [.001 to .18]) exists only for the celebrity identification condition; while the indirect path is not significant when the celebrity cannot be identified (indirect effect = −.05, SE = .06, 95% CI: [−.20 to.04]). Hypothesis 3b was thus supported.

GENERAL DISCUSSION

In the present research, across a series of four studies, we show that the presence of a disfluent celebrity endorser's face can have a positive impact on audience memory of the endorsed brand. Study 1a provided an initial demonstration of this phenomenon in a real-life scenario. In Study 1b, we employed eye-tracking technology to show that the presence of a partly covered (versus uncovered) face increased the duration of viewing of the advertisement as well as the brand and product information by increasing the number and duration of fixations on the brand and product within an advertisement. Enhanced interest and arousal seem to be the underlying mechanism of enhanced memory of an endorsed brand, as the viewers tend to cross-check between the face area and the product/brand area when the face is partly covered. In Study 2, we manipulated the celebrity identification and examined its role in the face-attenuating effect on memory. Results illustrated that covering the endorser's face might help to increase the viewers' interest in the

advertisement on the whole, though such an effect is more likely to happen when the viewers can identify the celebrity than when they cannot. Finally, in Study 3, we showed that the positive indirect path of celebrity face clarity → engagement with advertisement → brand recall and recognition was significant and was moderated by identification of the celebrity (i.e., high coping potential).

Theoretically, this study offers new insight in the enduring debate regarding whether celebrity endorsements enhance consumer recall of the brand being advertised. Previous research used source credibility/ attractiveness models and matchup hypotheses to study the effects of celebrity endorsement on brand recall, but results were mixed (Erdogan 1999). The current study, however, suggests that visual attention, interest, and arousal may also play an important role in the relationship between celebrity endorsement advertisements and consumer brand recall, which may provide explanations for discrepancies among findings in previous research. For example, if participants have limited time and perceptual resources, the celebrity endorser's uncovered face may attract all visual attention toward the advertisement and thus impair brand recall (the "vampire effect"; see Erfgen, Zenker, and Sattler 2015).

The current research also yields abundant, directly implementable managerial implications. Puzzle elements could be added to celebrities' faces in endorsement advertisements to direct consumers' attention to important marketing communication information. Because coping potential (i.e., celebrity identification) also plays an important role in advertisement engagement and brand memory, the level of face attenuation should be carefully tested during advertisement design.

We observed that this effect emerges for various endorsers and with different forms of disfluency (e.g., partly cover and blurred), attesting to the robustness of these results in endorsement advertising contexts. Still, limitations and other explanations for these hypothesized relationships should be noted. The first limitation of the present research is that the manipulation of disfluency is confounded with visual saliency. According to visual attention theory, attention paid to objects relies on salient elements in any visual scene (Kinchla and Wolfe 1979). Therefore, the current research cannot rule out the visual saliency explanation, in which reduced face saliency leads to more visual attention toward the brand. Future research can be conducted to further study this possibility. For example, instead of using static celebrity faces, future studies could use video of moving faces (high salient object in both conditions) to seperate the manipulation of saliency and fluency.

The second limitation is that the effect of disfluency is confounded with affective reactions. For instance, for the

participants who were able to identify the celebrity under disfluent conditions, the enhanced memory of brand may simply due to the success of solving the ambiguity and may have nothing to do with disfluent experience. It could be the same outcome as if they figured out a word search or hidden picture; they accomplish something, and it feels good. Future studies, therefore, should consider the effect of affective reactions in the research design.

Due to resource limits, the present study only was carried out only in China, which leads to our third limitation in terms of cultural influence. The face covering or blurring in the endorsement advertisement may have been considered a "humble" or "modest" gesture toward the viewers, which may have resulted in higher likelihood of elaboration as compared with an uncovered face version. Because humility is considered a desirable virtue in East Asian culture, such possibility should not be simply ignored. Future research can be carried out to test whether humility or disfluency caused enhanced brand recall.

The fourth limitation is that our conclusion for brand recognition is not consistent across the studies. It is perhaps caused by ceiling effects (Lynch and Srull 1982; Singh, Rothschild, and Churchill 1988) or lack of power in some of the studies. Because the varied memory measures of brand recall and brand recognition may be able to help distinguish whether the phenomenon of the current study occurs at the encoding stage or the rehearsal/storage stage, future research on the reinforcing effect of disfluent celebrity faces on brand recognition should be carried out.

In addition, inviting participants who did not correctly recognize the celebrity would reveal if they had different patterns based on simply having an obscured versus full face without potential effects about identifying the celebrity. Open-ended responses would also be helpful to reveal respondents' perception of what was happening. Future research could consider these issues when carrying out an eye-tracking study to test the reinforcing effect of disfluent celebrity faces on brand memory.

Finally, due to the exploratory nature of the current study, we did not include multiple levels of face clarity in our studies. We also did not include the exposure time of advertisements as one of the conditions in our experiment design. Adding the factor of exposure time could help reveal whether the effect of disfluent face is cognitive based or affective based. If it is a cognitive-based effect, exposure time should moderate the relationship between face attenuating and brand recall, as viewers would have abundant cognitive resources to process brand information in both face conditions when the exposure time was long enough. This should be done in future studies to enhance the research precision of our current findings.

In conclusion, this research demonstrates that when a disfluent celebrity face is presented in an advertisement, it can enhance other important marketing communication information, leading to positive effects on memory performance of the endorsed brand. It is our hope that the present research may help firms understand the nature of the effects of using a celebrity's face in advertising, harness the economic benefits of celebrity endorsement, and guide future explorations of the impact of fluent and disfluent advertising elements regarding the competition of pleasance and interest.

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APPENDIX

(a)   (b)

Stimuli used in Study 1a: (a) partly covered face condition; (b) uncovered face condition.
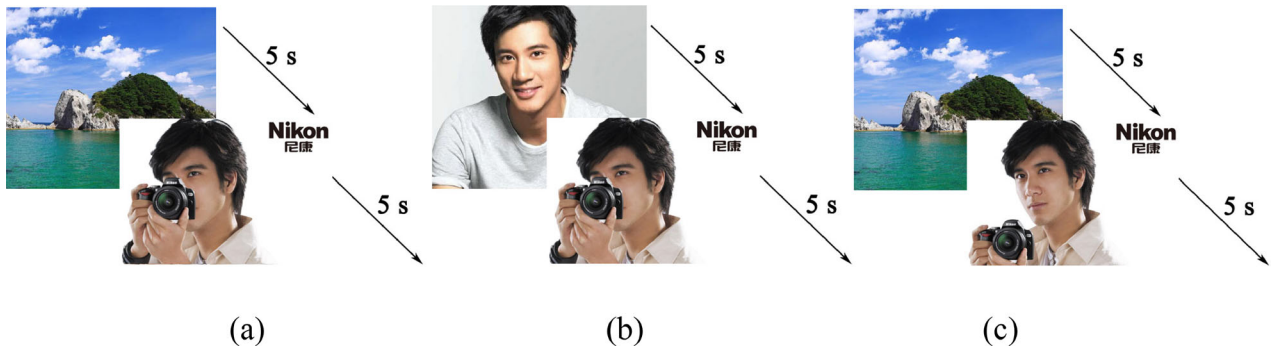
Stimuli used in Study 2: (a) covered face condition; (b) covered face condition with identification cue; (c) uncovered face condition.

Stimuli used in Study 3: (a) blurred face condition; (b) clear face condition; (c) control condition.