Turning the other cheek: Facial orientation influences both model attractiveness and product evaluation

Abstract

The layout of visual elements in advertising influences consumers' perception and judgments. The research reported here investigates the influence of the face orientation of a human model on the perception of their attractiveness and its downstream consequences on product evaluation. Across five experiments, we first demonstrate that consumers tend to perceive a model's face showing his or her left cheek as more attractive than when showing the right cheek, even when the images are otherwise identical. More importantly, we demonstrate the downstream influence of face orientation on the evaluation of advertised products whereby the leftward (vs. rightward) model's face increases the evaluation of the advertised product through perceived model attractiveness. We identify the underlying mechanism of the face orientation effect, namely that consumers perceive those faces showing their left (vs. right) cheek as more prototypical, and that this perception of prototypicality elicits an aesthetic preference for the model's leftward face which in turn carries over to influence product evaluation. The theoretical and practical implications of this research are also discussed.

Keywords: face orientation, model attractiveness, product evaluation, prototypicality

1. INTRODUCTION

There is growing evidence that the layout of product image information in advertising affects consumer evaluation. Previous studies regarding product position effects have shown that the location of product images in the vertical or horizontal dimensions influences consumer responses to advertising (e.g., Chae & Hoegg, 2013; Deng & Kahn, 2009; Simmonds, Woods, & Spence, 2018; Togawa, Park, Ishii, & Deng, 2019). For example, Togawa et al. (2019) demonstrated that, based on the arguments of visual weight judgment, the bottom (vs. top) location of a food image in a package façade enhances a consumer's perception of how heavy the food is and also influences the amount of food consumed.

Recent studies in marketing also reveal that not only the location but also the direction of product images in advertisements influence the response of consumers. For instance, Leonhardt, Catlin, and Pirouz (2015) drew on the arguments of a perceptual preference for inward-facing objects in a frame, and reported that consumers' showed more positive responses to the profile images of products facing inward (vs. outward) toward the center of the frame in advertising. Zhang, Kwak, Jeong, and Puzakova (2019) extended the position-temporal congruence effect first reported by Chae and

Hoegg (2003) into the directional-temporal dimension. In particular, they demonstrated that those products with their image facing toward the left (vs. right) in advertisements are evaluated more favorably when consumers focus on the past and vice versa for those consumers who focus on the future instead.

Relevant prior research in marketing suggests that the layout of the product in advertising can significantly alter consumer responses, therefore emphasizing the importance of such issues for advertising design. However, no previous research has systematically examined the possible influence of the layout of human models in advertising on consumer evaluations, even though models are widely used in various types of advertising.

To fill this gap in the research, our study focuses on the unique relationship between the orientation of a model's face in an image and their perceived attractiveness. Across five experiments, we first demonstrate that the mere difference in face orientation of a model affects the rated attractiveness of their face. Specifically, we confirm that consumers perceive a model's face showing his/her left cheek to be more attractive than when showing the right cheek even when the images are otherwise identical. In addition, and more importantly, we also demonstrate the significant downstream influence of face orientation on the evaluation of advertised products via

perceived model attractiveness. Furthermore, we identify the perceived prototypicality of face orientation as the mediator of the relationship between a model's face and perceived model attractiveness.

This research makes several key contributions to the literature. To the best of our knowledge, this study is the first to demonstrate the face orientation effect on perceived model attractiveness and its downstream consequences on the evaluation of advertised products. Whereas previous research has documented the layout effect of product images, our study shows that the layout of human models also influences consumer judgments. Therefore, our novel findings add to the literature demonstrating the effects of visual layout in advertising. Second, our research extends the literature on physical attractiveness in marketing communications by highlighting that perceived model attractiveness is determined not only by the level of physical attractiveness but also by the orientation in which a model poses. Third, our study provides new insight into the underlying mechanism of the left cheek preference bias. Previous psychological studies have explained the leftward preference bias in terms of the asymmetry in facial expressions resulting from the right-brain specialization for emotion processing. Meanwhile, our research demonstrates that the left cheek preference bias is also found in the identical face condition (i.e., an original face image and its mirror-reversed

image) and identifies the perceived prototypicality for the face orientation as the underlying cause of the leftward bias. Thus, this research furthers our understanding of the psychological mechanisms underlying the left cheek preference phenomena. Lastly, the current research provides valuable practical implications for marketing communications. Our research reveals that the effect of leftward preference on perceived model attractiveness and advertised products are found to be significant regardless of the model's and consumer's gender. Thus, the findings clearly suggest using a model showing the left (vs. the right) cheek will be beneficial in terms of increasing the positive response of consumers to advertising.

2. THEORETICAL BACKGROUND

2.1 Model attractiveness and consumer persuasion

Attractive human models are widely used in many types of product advertisement. Numerous studies in psychology and marketing have reported model attractiveness to be a significant factor positively affecting the evaluation of advertised products, advertisements, and advertising messages (e.g., Caballero & Pride, 1984; Chaiken, 1979; Reingen & Kernan, 1993; Trampe, Stapel, Siero, & Mulder, 2010). The finding that those products that are accompanied by an attractive model tend to evoke a

more positive attitude toward the product being advertised can be explained by what is known as the transfer effect (Buunk & Dijkstra, 2011; Caballero, Lumpkin, & Madden, 1989). In particular, physically attractive individuals are generally perceived to be more sociable, warm, competent, and as having greater integrity (Eagly, Ashmore, Makhijani, & Longo, 1991; Langlois et al., 2000). Hence, when consumers see an attractive model in an advertisement, they automatically tend to associate the model's positive characteristics with the advertised product and therefore this association leads to a more favorable attitude toward the product that is being advertised. The present study attempts to shed light on the effect of model attractiveness in marketing communications by investigating the aesthetic perception of models using a novel experimental approach: Namely, focusing on the orientation of a model's face.

2.2 The left face superiority in facial expression and aesthetic perception

Interestingly, from historical paintings, all the way through to selfies on Instagram and advertisements, portraits have been documented to show more of the left side of the face (i.e., the left cheek) rather than the right (Conesa, Brunold-Conesa, & Miron, 1995; Duerksen, Friedrich, & Elias, 2016; Manovich, Ferrari, & Buno, 2017; McManus & Humphrey, 1973; Thomas, Burkitt, Patrick, & Elias, 2008). For instance, McManus and Humphrey (1973) reported that painted portraits from the Sixteenth to

the Twentieth Centuries tended to exhibit significantly more of the left cheek than the right. In a similar vein, Thomas et al. (2008) found that images of females in magazine advertisements indicated a significant left cheek posing bias too.

Psychological research suggests that this left-facing bias may be related to the left face superiority effect attributable to the right hemisphere's dominance for expressing facial emotions (Demaree, Everhart, Youngstrom, & Harrison, 2005; Indersmitten & Gur, 2003; Nicholls, Ellis, Clement, & Yoshino, 2004; Okubo, Ishikawa, & Kobayashi, 2013). In other words, because of the right-brain specialization for emotion processing and the contralateral innervation of the facial muscles, emotions tend to be expressed more intensely in the left hemiface than in the right. Previous research has revealed that those posing in photoshoots tend to show more of their left face than the right when asked to express their warmheartedness (Churches et al., 2012; Nicholls, Clode, Wood, & Wood, 1999). In addition, viewers tend to perceive the actual left (vs. right) side of a poser's face as more emotionally expressive and aesthetically pleasing (Blackburn & Schirillo, 2012; Harris & Lindell, 2011; Lindell, Tenenbaum, & Aznar, 2017; Nicholls, Wolfgang, Clode, & Lindell, 2002). As mentioned above, the left cheek bias has been well-documented in the face perception literature. However, the left face superiority effect in facial expression would seem to have limitations in terms of

fully explaining why it is that models facing leftward (vs. rightward) should be perceived more favorably. The reason is that the left cheek preference bias may be caused not only by the left face superiority of facial expression but also by the preference for the orientation of the face that happens to show the left-cheek. If viewers still perceive a model's leftward (vs. rightward) face to be more attractive in those cases where the images are otherwise identical such a result cannot simply be explained by a biological left face superiority in facial expression. This is because the only difference between the two images in such cases is in terms of the direction (e.g., the original face image showing the left-cheek vs. the mirror-reversed original image that appears to show the right-cheek). If this turns out to be the case, it would be reasonable to assume that face orientation has an independent effect on the perceived attractiveness of the model regardless of any influence of facial expression.

2.3 Advantage of the left oblique view in face processing

To examine the effect of face orientation, we draw on the literature on the advantages of the left visual field and the leftward face in face processing. Studies using chimeric faces (e.g., faces composed of two different half faces with one half smiling and the other half neutral) have confirmed the left visual field bias in face perception. Namely, viewers tend to make an initial fixation (Phillips & David, 1997) and look for

longer at the left half of the poser's face from the viewer's perspective (Butler et al., 2005; Mertens, Siegmund, & Grüsser, 1993). Additionally, a left visual field attentional bias in face processing has also been reported for judgments of emotion (Coolican, Eskes, McMullen, & Lecky, 2008; Failla, Sheppard, & Bradshaw, 2003), gender (Chiang, Ballantyne, & Trauner, 2000; Parente & Tommasi, 2008), age, and attractiveness (Burt & Perrett, 1997). The aforementioned studies can, therefore, be taken to illustrate left visual field superiority in face perception.

In addition, and more importantly, studies of face processing have also demonstrated that left (vs. right) oblique views, where most of the features (i.e., eyes, nose, and mouth) are placed in the viewer's left visual field, tend to receive more fixations (Busin, Lukasova, Asthana, & Macedo, 2018) and be recognized more easily (Kowatari et al., 2004; Siéroff, 2001; Yamamoto, Kowatari, Ueno, Yamane, & Kitazawa, 2005). For instance, Yamamoto and his colleagues had their participants match either a left or right oblique view of well-known faces (e.g., a portrait of Gandhi) with the relevant names presented either before or after the faces. The participants had to judge whether the test stimulus (face or name) matched the target stimulus (name or face) as rapidly as possible. In both tasks, the participants responded more rapidly to a left than to a right oblique view of the same face. In a similar vein, using functional

magnetic resonance imaging (fMRI), Kowatari et al. (2004) were able to demonstrate that the left oblique view of a face activates the memory retrieval system for face recognition (i.e., the right prefrontal cortex) more strongly than the right oblique view. To summarize, these studies suggest that people process a model's face showing their left cheek more easily than one showing their right cheek even when the two images are otherwise identical.

2.4 Processing fluency, prototypicality, and perceived attractiveness

Processing fluency refers to the subjective experience of the ease with which people process information (Alter & Oppenheimer, 2009). As fluency is associated with error-free information processing and successful stimulus recognition, it tends to elicit positive affect (Winkielman & Cacioppo, 2001; Winkielman, Schwarz, Fazendeiro, & Reber, 2003). Processing fluency has been shown to influence people's judgments across broad dimensions such as judgments of clarity (Whittlesea, Jacoby, & Girard, 1990), familiarity (Whittlesea, 1993), truth (Reber & Schwarz, 1999), and aesthetic pleasure (Reber, Schwarz, & Winkielman, 2004; Winkielman, Halberstadt, Fazendeiro, & Catty, 2006).

Bringing together the aforementioned findings of the leftward advantage in face processing and the relationship between processing fluency and aesthetic pleasure, it

can be predicted that a model's leftward-facing face will be perceived as more attractive than the rightward-facing face, even when the two images are otherwise identical. Thus:

H1: A model's face showing the left (vs. right) cheek will be perceived as more attractive even when the two images are otherwise identical.

In addition, psychological research has shown that a physically attractive spokesperson can facilitate attitude change for persuasive messages (e.g., Chaiken, 1979; Horai, Naccari, & Fatoullah, 1974). Similarly, a number of marketing studies have revealed that source attractiveness in advertisements creates increased attention and positive feelings toward the advertisement and the product being advertised (e.g., Callcott & Phillips, 1996; Kang & Herr, 2006; Yilmaz, Eser Telci, Bodur, & Iscioglu, 2011). Source attractiveness refers to the communicator's ability to create a positive emotional experience (Yilmaz et al., 2011). Source attractiveness is found to be an important indicator of advertising effectiveness and the presence of an attractive endorser or model in an advertisement positively relates to the evaluation of the advertised product (Amos, Holmes, & Strutton, 2008; Chao, Wührer, & Werani, 2005; Yilmaz et al., 2011). Thus, we predict that:

H2: Perceived model attractiveness (resulting from the left cheek preference) will increase the viewer's attitude toward the advertised product.

Reber et al. (2004) have suggested that the fluent processing of a target object leads to aesthetic pleasure for that object. That is, the more fluently that perceivers process an object, the more positive their aesthetic response will be. Various features of stimuli such as figural goodness, figure-ground contrast, stimulus repetition, symmetry, and prototypicality will likely all affect the aesthetic response to the target stimuli (Reber et al., 2004). Among these features, we focus especially on the prototypicality of objects. A number of studies have demonstrated that prototypical stimuli are processed more easily than atypical ones (e.g., Posner & Keele, 1968; Reber, Stark, & Squire, 1998; Winkielman et al., 2006). In addition, cognitive psychology studies have shown that prototypicality positively influences various aesthetic evaluations of target objects such as geometric patterns (e.g., Winkielman et al., 2006), paintings (Hekkert & van Wieringen, 1990), automobiles, birds, fish (Halberstadt & Rhodes, 2003), and even faces (Langlois & Roggman, 1990; Rhodes & Tremewan, 1996). For instance, by digitizing people's faces and mathematically averaging them, Langlois and Roggman (1990) were able to demonstrate that viewers rate computer-generated composite faces as more attractive than the original.

Although, to date, no studies have directly examined which face orientation is more prototypical, it is highly plausible that a face showing the left (vs. right) cheek will

be perceived as more prototypical when we take into account the following findings. Studies of figure drawing have shown that right-handed people tend to draw a human face, an arrow, a pencil, and a fish facing leftward (Tosun & Vaid, 2014; Vaid, Singh, Sakhuja, & Gupta, 2002). In addition, as stated above, faces in various media such as paintings (e.g., McManus & Humphrey, 1973), advertisements (Thomas et al., 2008), and social networking services (Manovich et al., 2017) tend to display more of the left cheek, than the right. Furthermore, a study using the search engine in Google images has demonstrated that a significant leftward bias is not only observed in photographs of humans but also in photographs of non-human animals such as dogs, fish, and lizards (Thomas, Burkitt, & Saucier, 2006). Such results suggest that people's repeated left-biased perceptual experience of various faces in daily life may induce and/or reinforce perceived prototypicality of a face view of the left cheek. In addition, the perception of leftward prototypicality may influence the perceived attractiveness of the model's face showing the left cheek. Therefore, we predicted that:

> H3: Perceived prototypicality for a model's face that shows the left (vs. right) cheek will mediate the influence of face orientation on the perception of model attractiveness.

3. OVERVIEW OF EXPERIMENTS

The present research consists of five experiments that were designed to examine the effect of face orientation on perceived model attractiveness and the evaluation of the advertised product. Experiment 1 is designed to examine whether the face orientation of models influences their perceived attractiveness when the images are otherwise identical (H1). Experiment 2 investigates the influence of the orientation of the face on product evaluation via perceived model attractiveness (H1 and H2). Experiment 3 further examines the face orientation effect on product evaluation while eliminating a possible confounding factor (H1 and H2). Experiment 4 tests the relationship between a model's face orientation and perceived prototypicality for the orientation and model attractiveness using a paired comparison method. Finally, Experiment 5 examines the mediating role of perceived prototypicality of face orientation on the relationship between the orientation and the perception of model attractiveness (H3).

4. EXPERIMENT 1

Using a face database, this experiment aimed to examine whether models showing their left cheek would be perceived as more attractive than when appearing to

show their right cheek regardless of whether the orientation of the original images was facing to the left or right.

4.1 Method

The participants in all experiments were recruited online from Yahoo Crowd Sourcing service (https://crowdsourcing.yahoo.co.jp/) provided by Yahoo! Japan Corporation. The Yahoo service is one of the largest crowdsourcing platforms in Japan (Majima, 2019) and recent marketing studies conducted over there have used this platform (e.g., Sunaga, 2018; Sunaga, Park, & Spence, 2016; Youn, Park, & Eom, 2019). Survey Monkey (https://www.serveymonkey.com) was used in all experiments to collect participants' responses. The experiment protocol was approved by the first author's institutional review board, and all participants provided their consent online prior to taking part in the studies.

In Experiment 1, we used the database of The Karolinska Directed Emotional Faces (KDEF) (Lundqvist, Flykt, & Ohman, 1998) to create the stimuli. This database provides people's portraits taken from five different angles (i.e., full left profile, half left profile, straight, half right profile, or full right profile) with seven emotional expressions (neutral, happy, angry, afraid, disgusted, sad, and surprised). We randomly chose the photographs of five male models' half-left and half-right profile face with two facial

emotions (i.e., neutral and happy). Using the 20 original images, and the 20 mirror-reversed images, a total of 40 images of face stimuli were created. Microsoft PowerPoint and Gnu Image Manipulation Program (GIMP) 2.10.6 (www.gimp.org) were used for creating visual stimuli throughout all our experiments. The resolution of each picture was 398 × 540 pixels.

A 2 (face orientation: left cheek vs. right cheek) × 2 (original face: left face vs. right face) × 2 (face emotion: neutral vs. happy) between-subjects experimental design was conducted.

Three hundred and fifty-five participants were recruited for Experiment 1 (114 female; M_{age} = 43.1 years)[1]. They received a point worth 20 JPY for completing an approximately 2-minute short survey. At the beginning of the experiment, participants were informed the survey was about rating physical attractiveness of several persons based on pictures. After providing their informed consent, the participants were randomly assigned to one of eight conditions and asked to rate the perceived

[1] A priori power analyses using G*power 3.1 (Faul, Erdfelder, Lang, & Buchner, 2007) for all experimental designs excepting that of Experiment 2 indicated that the number of recruited participants in each study was sufficient to detect a medium effect size with 80% power at an alpha level of .05 (as recommended for behavioral studies, Cohen, 2013). The power analysis for Experiment 2 indicated that 128 participants would be needed to detect a medium effect size (d = 0.50) of difference between two independent means. The number of recruited participants (n = 98) was slightly lower than the estimated sample size.

attractiveness of the five models on 7-point scales (1 = not attractive at all, 7 = very attractive). At the end of the experiment, participants reported their age and gender.

[Insert Figure 1 about here]

4.2 Results

As preparation for the main analysis, we first calculated the mean perceived attractiveness of the five models in the eight conditions (see Table 1) and aggregated the scores of the perceived attractiveness of the five models (α = .87).

[Insert Table 1 about here]

Subsequently, we conducted a 2 (face orientation: left cheek vs. right cheek) × 2 (face origin: left face vs. right face) × 2 (face emotion: neutral vs. happy) ANCOVA on perceived model attractiveness as a dependent variable and participants' gender as a covariate. Gender was included as a covariate in all of our statistical analyses throughout this study since prior research suggests that gender differences may sometimes influence the perception of face stimuli (e.g., McBain, Norton, & Chen, 2009; Rueckert & Naybar, 2008). The analysis revealed significant main effects of face orientation ($M_{\text{left cheek}}$ = 4.09, SD = 1.01 vs. $M_{\text{right cheek}}$ = 3.81, SD = .97; $F(1, 346)$ =

7.28, $p = .007$, $\eta_p^2 = .02$) and face emotion ($M_{neutral} = 3.58$, SD = .83 vs. $M_{happy} = 4.41$, SD = 1.00; $F(1, 346) = 74.20$, $p < .001$, $\eta_p^2 = .18$) on perceived model attractiveness. Meanwhile, none of the other direct and interaction effects reached significance (all F's < 1). Note here also that including the participant's gender ($F < 1$) as a covariate did not influence the results.

[Insert Figure 2 about here]

4.3 Discussion

Experiment 1 provided initial evidence that consumers perceive a model's face showing their left (vs. right) cheek as more attractive even when the images were otherwise identical (i.e., left face vs. mirror-reversed left face, mirror-reversed right face vs. right face) regardless of the facial emotion (i.e., neutral vs. smile) expressed. Therefore, H1 was supported.

5. EXPERIMENT 2

Experiment 2 was designed to test whether the face orientation of a model in an advertisement can have an influence on the evaluation of advertised products via perceived model attractiveness.

5.1 Method

A pair of fictitious advert images were created: a dress with a smiling female showing her left cheek and right cheek, respectively (see Figure 3). The resolution of the visual stimulus was 1014 × 592 pixels. A one-factorial (face orientation: left cheek vs. right cheek) between-subjects experimental design was conducted. Ninety-eight adults (49 females; M_{age} = 41.3 years) took part in the experiment. They received a point worth 25 JPY for completing an approximately 3-minute survey. At the start of the experiment, participants were explained that the survey aims to evaluate an advert image. After providing consent, the participants were randomly assigned to either the left cheek or the right cheek condition. They were asked to rate the model's attractiveness on two 7-point scales (1 = strongly disagree, 7 = strongly agree; "This model is attractive", "This model is beautiful"; α = .91). Afterwards, the participants reported their attitude toward the product with three 7-point bipolar scales (good – bad; like – dislike; favorable – unfavorable; α = .90). Finally, the participants reported their age and gender.

[Insert Figure 3 about here]

5.2 Results

We first conducted an ANCOVA with gender as a covariate to test the effect of face orientation on perceived model attractiveness. The results replicated the findings of Experiment 1 and indicated that the female model showing the left cheek was perceived as more attractive than when showing the right cheek ($M_{\text{left cheek}}$ = 5.78, SD = .72 vs. $M_{\text{right cheek}}$ = 5.38, SD = 1.17; $F(1, 95) = 4.42$, $p = .038$, $\eta_p^2 = .04$; see Figure 4). Consistent with Experiment 1, the results indicated that the gender of the participants ($F < 1$) had no influence on the results.

[Insert Figure 4 about here]

Subsequently, to test whether the orientation of the model's face influenced product evaluation through perceived attractiveness, a mediation analysis was performed using Model 4 of the PROCESS SPSS macro (Hayes, 2018) with 5000 bootstrap samples. We included gender as a covariate in the analysis model. The results revealed that compared to the female face showing the right cheek, the face showing the left cheek (coded as 0 = right cheek, 1 = left cheek) increased model attractiveness ($b = .44$, SE = .20, $t = 2.10$, $p = .038$). Subsequently, the model attractiveness positively influenced the participants' evaluation of the dress ($b = .57$, SE = .11, $t = 5.29$, $p < .001$). Additionally, and more importantly, the indirect effect of face orientation on

product evaluation via model attractiveness was also significant at the 95% confidence interval (b = .24, SE = .11, 95% CI [.0154, .4615]). Therefore, support was obtained for both H1 (a model's face showing the left cheek will be perceived as more attractive) and H2 (perceived model attractiveness will increase product evaluation). The participant's gender did not influence the results (all p's > .44).

6.3 Discussion

Experiment 2 demonstrated that the mere difference in the face orientation of a model can exert a significant influence over product evaluation through perceived model attractiveness. These results therefore not only provide additional evidence that the model's face orientation can increase his/her rated attractiveness, but also highlight a new finding concerning the downstream consequences of the face orientation on consumers' evaluation of the advertised product.

However, the advertising images presented to the participants in Experiment 2 might have some limitations. In the images, the model's face and the dress were placed on the left and right side, respectively. This composition might have resulted in the model in the leftward condition appearing to avert her gaze from the product, while the model in the rightward condition seems to be gazing directly toward the product. Previous studies show that the gaze direction of a model may influence the evaluation

of advertised products and advertisements (Adil, Lacoste-Badie, & Droulers, 2018; Palcu, Sudkamp, & Florack, 2017). Therefore, the difference in gaze direction between the two conditions may potentially have confounded the effect of face orientation on the evaluation of the displayed product. In addition, the advertising stimuli looked somewhat unnatural (i.e., a model is typically shown wearing the clothes in actual advertisements) and not so realistic (i.e., no advertising messages in the advertising stimuli). Experiment 3 was therefore conducted in order to overcome these potential issues.

6. EXPERIMENT 3

The purpose of Experiment 3 was to further examine the face orientation effect dealing with the possible problems of paralleling a face image and a product in advertising stimuli. To do so, Experiment 3 used the vertical placement of a model and a product in advertising stimuli.

6.1 Method

We created two pairs of fictitious adverts for a beauty treatment salon: A pair of adverts for a man's salon and another pair for a woman's salon, respectively (see Figure 5)[2]. A model's face in each pair of the adverts showed either the left cheek or right

[2] The images were purchased from Shutterstock (https://www.shutterstock.com).

cheek. The advertising messages in the adverts provided the name of the beauty salon (i.e., “Dandy Salon” for the men’s ad and “Muse Salon” for the women’s ad) and an advertising claim (“Polish your appearance at Dandy/Muse Salon”). The resolution of each visual stimulus was 341 × 451 pixels. A 2(face orientation: left cheek, right cheek) × 2(ad target/model gender: male, female) between-subjects experimental design was used.

[Insert Figure 5 about here]

Two hundred and twelve participants were recruited for Experiment 3 (65 female; M_{age} = 45.5 years). They received a point worth 25 JPY for completing an approximately 3-minute short survey. After providing informed consent, the participants were randomly assigned to one of four conditions and asked to rate the model’s attractiveness with the same two items used in Experiment 2 (α = .91). Subsequently, the participants reported their attitude toward the product using the same three items as in Experiment 2 (α = .96). Afterward, they were asked to report their handedness with the 4-item Edinburgh handedness inventory (Veale, 2014) which measures people’s handedness in terms of writing, throwing, using a toothbrush, and holding a spoon on 5-point scales respectively (100 = always right, 50 = usually right, 0 = both equally, −50 =

usually left, −100 = always left; α = .88). This measurement generates scores from 100 to −100. People with handedness scores from 61 to 100 are considered to be right-handed. The average handedness score of the participants was 79.36 (SD = 42.25). Finally, the participants indicated their gender and age.

6.2 Results

An ANCOVA was conducted first with face orientation and model gender as independent variables and perceived model attractiveness as a dependent variable with participant gender and handedness as covariates. Studies of face perception suggest that the handedness of a person is related to the degree of brain lateralization and therefore it may result in differences in his or her perception of target faces (e.g., Bourne, 2008; Hoptman & Levy, 1988). As such, to examine the possible influence of individual differences in face perception more precisely, in addition to gender, we also included the handedness of the participants in the analysis model as an additional covariate.

The results revealed a significant main effect of face orientation ($M_{\text{left cheek}}$ = 4.35, SD = 1.33 vs. $M_{\text{right cheek}}$ = 3.87, SD = 1.33; $F(1, 206) = 6.76$, $p = .01$, $\eta_p^2 = .03$; see Figure 6) on perceived model attractiveness. Thus, H1 was again supported. Meanwhile, the main effect of model gender (M_{male} = 4.14, SD = 1.33 vs. M_{female} = 4.10, SD = 1.38; $F(1, 206) < 1$) and the interaction between the face orientation and model

gender ($F(1, 206) = 2.74$, $p = .10$, $\eta_p^2 = .01$) were not significant. The participant's gender and handedness did not influence the results (F's < 1). The model's gender did not influence the effect of face orientation on the perception of model attractiveness. Consequently, the perceived attractiveness scores for the male and female models were averaged for further analysis.

[Insert Figure 6 about here]

To test the effect of face orientation on the evaluation of the advertised product, we conducted a mediation analysis using Model 4 of the PROCESS SPSS macro (Hayes, 2018) with 5000 bootstrap samples (see Figure 7). The results replicated the findings of Experiment 2. Compared to the model's face showing the right cheek, the face showing the left cheek (coded as 0 = right cheek, 1 = left cheek) positively influenced model attractiveness ($b = .47$, SE = .18, $t = 2.58$, $p = .011$), which, in turn, increased the evaluation of the advertised product ($b = .64$, SE = .05, $t = 12.85$, $p < .001$). In addition, and importantly, the indirect effect of face orientation on product evaluation via model attractiveness was also significant at the 95% confidence interval ($b = .30$, SE = .12, 95% CI [.0723, .5455]). Therefore, the results once again supported H1 and H2.

[Insert Figure 7 about here]

7.3 Discussion

Across Experiments 1 to 3, the results consistently revealed that the model's left hemiface (cheek) is perceived as more attractive than their right hemiface (cheek) even when the images were otherwise identical (H1). In addition, and more importantly, the results of Experiments 2 and 3 demonstrated that a model's face orientation in an advertisement can elicit a more favorable attitude toward the advertised product via perceived model attractiveness (H1, H2). Meanwhile, the reason as to why a model's face facing leftward (vs. rightward) is perceived as more attractive has yet to be properly examined. Thus, we investigate this underlying mechanism in Experiment 4.

7. EXPERIMENT 4

Experiment 4 aimed to examine the relationship between the face orientation of a model and perceived prototypicality for the orientation, and perceived attractiveness of the model using a paired comparison method.

7.1 Method

We created pairwise visual stimuli using the stimuli from Experiment 3. To avoid possible confounding by the horizontal position of an advert (i.e., the ad placed in the left vs. right side), we created four pairs of visual stimuli: Two pairs of beauty treatment ads for men and women in which the left (right) cheek version of the ad was placed on the left (right) side (see Figure 8). The resolution of each visual stimulus was 695 × 455 pixels. The experimental design was between-subjects 2 (model gender of the ad: male, female) × 2 (type of paired stimulus: the left cheek version on the left side, the left cheek version on the right side).

[Insert Figure 8 about here]

Two hundred and fifty-two participants (69 female; M_{age} = 45.8 years) were recruited and randomly assigned to one of four conditions. Participants received a point worth 25 JPY for completing a 3-minute study. As we counterbalanced the position of the left cheek and the right cheek version of the ads, the possible confounding influence of horizontal positioning bias in the visual stimuli on the face orientation effect was eliminated. At the start of the experiment, the participants were informed of the purpose of the study as follows: “The paired images you will see on the next page are two

versions of a beauty treatment ad created by an advertising agency. Your task is to evaluate which version of the ad is preferable."

After providing their informed consent, the participants were asked to view a pair of stimuli and required to rate the perceived prototypicality of the model's pose orientation with a 6-point scale (1 = leftward facing is definitely prototypical, 6 = rightward facing is definitely prototypical; "Which angle seems to more prototypical in the two versions of the ads?"). The participants were also asked to choose either of advertisement in which the model looked more attractive (i.e., leftward facing version or rightward facing version). The order in which the two questions were presented was randomized in order to eliminate any possible order effects. Afterwards, the participants were asked to report their handedness with the same four scales used in Experiment 3 (M = 73.46, SD = 47.32; α = .89) and indicated their age and gender.

7.2 Results

We first conducted a chi-square test for independence to examine whether the model gender influences the binary response for the perceived prototypicality. A binary variable of the perceived prototypicality was created by splitting the score (M = 3.75, SD = 1.27) into two categories: scores no larger than 3 as "the leftward prototypicality" and scores of 4 or more as "the rightward prototypicality". The result of the independent

test indicated that the model's gender did not influence the response of the perceived prototypicality ($\chi^2(1) < .01,\ p = .523,\ \phi < .01$). In addition, and importantly, a chi-square goodness of fit test for the perceived prototypicality revealed that 59.1% of the participants (149 out of 252) chose a leftward-facing model (vs. rightward) as being more prototypical ($\chi^2(1) = 8.40,\ p = .004$).

Subsequently, in order to examine whether the model's gender influenced the binary response for perceived attractiveness, a chi-square test for independence was conducted. Consistent with the results of Experiment 3, the gender of the model did not affect the perception of model attractiveness ($\chi^2(1) = .10,\ p = .423,\ \phi = .02$). A chi-square goodness of fit test for perceived attractiveness revealed that 57.9% of participants (146 out of 252) chose a leftward (vs. rightward) model face as being more attractive ($\chi^2(1) = 6.35,\ p = .012$).

7.3 Discussion

Experiment 4 provided initial evidence that, as expected, consumers tend to perceive a model's face showing the left cheek as more prototypical than one showing the right cheek even when the images are identical. In addition, replicating the findings of Experiments 1 to 3, the participants also indicated a preference for the model's face facing leftward (vs. rightward) in the evaluation of model attractiveness. In summary,

Experiment 4 suggests that the face orientation of a model may influence the perceived attractiveness via the perceived prototypicality of their orientation. However, we did not directly examine this expected mediation process. Thus, we addressed this issue in Experiment 5.

8. EXPERIMENT 5

The purpose of Experiment 5 was to examine the underlying mechanism of the face orientation effect on perceived model attractiveness. Specifically, we investigated the mediating role of perceived prototypicality of face orientation on the relationship between the orientation of a model and the perception of model attractiveness. We also examined the downstream effect of face orientation on the evaluation of the advertised product through serial meditation (i.e., the effect of face orientation on product evaluation via perceived prototypicality of the orientation and model attractiveness).

8.1 Method

The experimental stimuli were two versions of a treatment salon advert for women used in Experiment 3. A one-factor (face orientation: left cheek, right cheek) between-subjects design was used. One hundred and nineteen participants were recruited for Experiment 5 (25 female; M_{age} = 50.1 years). They received a point worth 25 JPY for completing an approximately 3-minute survey. At the beginning of the

experiment, participants were informed that the task is to evaluate a beauty salon advert created by an advertising agency. After providing consent, participants were randomly assigned to either condition and asked to rate the perceived prototypicality of the face orientation. The prototypicality was measured with two 7-point items adapted from the design typicality measurements of Landwehr, Labroo, and Herrmann (2011) for the present context (1 = strongly disagree, 7 = strongly agree; “The pose angle of the model is typical”, “The pose angle of the model is familiar”; α = .88). Subsequently, they evaluated the model’s attractiveness with the same two items (α = .88) and reported their attitude toward the product using the same three items (α = .95) used in Experiments 2 and 3. Afterward, the participants were asked to report their handedness with the same four scales used in Experiments 3 and 4 (M = 77.73, SD = 42.72; α = .86). Finally, the participants indicated their age and gender.

8.2 Results

To test whether the perceived prototypicality of face orientation would mediate the relationship between the orientation of the model’s face and their perceived attractiveness, a mediation analysis was performed using Model 4 of the PROCESS SPSS macro (Hayes, 2018) with 5000 bootstrap samples. We included participants' gender and handedness as covariates in the analysis model. The results revealed that

compared to the female face showing the right cheek, the face showing the left cheek (coded as 0 = right cheek, 1 = left cheek) increased the perceived prototypicality of the face orientation (b = .44, SE = .22, t = 2.01, p = .047). Subsequently, the perceived prototypicality positively influenced the participants' evaluation of the model's attractiveness (b = .29, SE = .10, t = 2.88, p = .005; see Figure 9). There was no influence of the participant's gender (all p's > .24) and handedness (all p's > .62) on the results. In addition and more importantly, the indirect effect of face orientation on model attractiveness via perceived prototypicality was also significant at the 95% confidence interval (b = .13, SE = .08, 95% CI [.0009, .3196]). Therefore, support was obtained for H3 (Perceived prototypicality of a model's face will mediate the influence of face orientation on the perception of model attractiveness). Further, a serial mediation analysis (Model 6; Hayes, 2018) with 5000 bootstrap samples demonstrated a significant indirect effect of the model's face orientation on product evaluation via the perceived prototypicality and model attractiveness at the 95% confidence interval (b = .07, SE = .04, 95% CI [.0004, .1723]).

[Insert Figure 9 about here]

8.3 Discussion

The results of Experiment 5 provide support for H3 and demonstrate that the perceived prototypicality for the face orientation of a model significantly mediates the influence of the orientation of a model's face on the perception of model attractiveness. The results of Experiment 5 also revealed a significant serial mediation effect linking the face orientation of a model to the evaluation of an advertised product through both perceived prototypicality of the orientation and model attractiveness.

9. GENERAL DISCUSSION

Across five experiments, the current research established a significant face orientation effect: A model's face in advertising showing the left (vs. right) cheek is perceived as more attractive even if the images are otherwise identical and this aesthetic bias results in more favorable evaluations for the advertised products. We also demonstrate that the perceived prototypicality of the face orientation mediates the influence of orientation on product evaluation.

Experiment 1 revealed that individuals perceive the model's face showing their left (vs. right) cheek as more attractive even though the images are otherwise identical. Experiment 2 replicated the face orientation effect demonstrated in Experiment 1 and demonstrated that the face orientation of a model in an advertisement can elicit a positive attitude toward the advertised product via perceived model attractiveness.

Experiment 3 provided more robust support for the effect of face orientation on the advertised product by eliminating a possible confounding factor. Experiment 4 documented a preference bias amongst participants for the leftward face in the perception of orientational prototypicality using a paired comparison method. Finally, the results of Experiment 5 revealed that the perceived prototypicality for face orientation mediates the influence of a model's face orientation on the perception of model attractiveness. The final experiment also revealed a significant serial mediation effect linking the face orientation of a model to the evaluation of an advertised product via both perceived prototypicality of the orientation and model attractiveness.

9.1 Theoretical contributions

The present study makes three important theoretical contributions. First, our research extends prior research on visual layout effects in advertising by investigating the influence of the direction in which a model poses on product evaluation. While previous research has documented the layout effect of product position (e.g., Chae & Hoegg, 2013) and direction (e.g., Zhang et al., 2019), our research is the first to demonstrate that the layout design of human models also influences consumer judgments of advertising. Therefore, our novel finding adds to the body of literature on the effects of visual layout design in advertising.

Second, the present research extends the literature on the effect of physical attractiveness in marketing communication by highlighting that the perception of model attractiveness is determined not only by the level of physical attractiveness but also by the orientation in which a model poses. The research reported here, therefore, provides a more nuanced understanding of perceived model attractiveness and the effect of physical attractiveness on marketing.

Third, the current research provides new insight into face perception and the underlying mechanism of the left cheek preference bias. Previous psychological studies have explained the leftward preference bias in terms of the right hemisphere's dominance for expressing facial emotions (e.g., Blackburn & Schirillo, 2012; Harris & Lindell, 2011). Meanwhile, our research demonstrates that the left cheek preference bias is found even when the face images are otherwise identical and identifies the perceived prototypicality for the face orientation as the underlying cause of the leftward bias. Thus, the results of the research that has been reported here deepen our understanding of the psychological mechanisms of the left cheek preference phenomena in face perception.

9.2 Managerial Implications

The findings of this research offer clear managerial implications for marketing communications. When marketers and advertising practitioners plan to use a model in advertisements, it is more desirable to present a model's face showing their left rather than the right cheek in order to increase the perception of the model's attractiveness and thus strengthen the consumers' attitudes toward products and services. The results of our research revealed that the effect of leftward preference was shown to be significant regardless of the model's and participant's gender. Thus, considering the face orientation of a model in the design of advertising will likely be beneficial as far as increasing the effectiveness of advertising for both male and female consumers.

9.3 Limitations and directions for future research

The current study has a number of limitations that should be addressed in future research. One of the limitations regards the layout of the advertising stimuli used in our research. In Experiments 3, 4, and 5, we used vertically-arrayed advertisements to eliminate the influence of gaze bias. However, horizontal ad design in which a model and a product, were located parallel to each other is also pervasive in advertising practice. Studies in aesthetics and advertising suggest that locating an object of either facing leftward or rightward into either the left side or right side of a frame induce inward/outward bias and this bias may influence the evaluation of the object (e.g.,

Leonhardt et al., 2015; Palmer, Gardner, & Wickens, 2008). Thus, it would be important to examine the possible interaction of a model's face orientation and inward/outward bias on the perceived model and product evaluation. Relatedly, a recent study of advertising has shown that those images of products facing toward the leftward (vs. rightward) from the viewer's perspective in advertising are evaluated more favorably when consumers' temporal focus is on the past, whereas the reverse holds true when consumers focus is on the future instead (Zhang et al., 2019). Thus, it would be interesting and fruitful to examine the effect of face orientation of a model in past-related (i.e., nostalgic) and future-related advertising.

The other issue is the possibility of the positive rightward face orientation effect on ad evaluations. A study that investigated the pose orientation of ad models reported a significant left cheek posing bias in advertisements (Thomas et al., 2008). Meanwhile, one study has reported a rightward (vs. leftward) pose of a model is more often shown in adverts (Burkitt, Saucier, Thomas, & Ehresman, 2006). If consumers tend to perceive a model's face showing the left (vs. right) cheek as prototypical and familiar, the model's rightward face should be perceived as more atypical and unfamiliar. This perception of atypicality may positively influence the evaluation of advertised products and advertising itself in certain conditions such as when advertisements emphasize the

uniqueness or innovativeness of products or ad messages. Thus, it would be both intriguing and important to explore the possibility and boundary condition of the positive rightward orientation effect in future research.

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Table 1. The mean scores of the models' perceived attractiveness in Experiment 1. *Note*: Left face and right face in the table indicate the original orientation of the models' face. The values in parentheses are standard deviations.

	Neutral				Smiling			
	Left face		Right face		Left face		Right face	
Model	Left cheek	Right cheek	Left cheek	Right cheek	Left cheek	Right cheek	Left cheek	Right cheek
1	4.02 (.97)	3.50 (1.16)	3.85 (.93)	3.82 (1.20)	4.45 (1.29)	4.40 (1.17)	4.19 (1.12)	3.77 (1.02)
2	3.81 (1.13)	3.42 (1.24)	3.72 (1.16)	3.60 (1.06)	4.79 (1.28)	4.51 (1.12)	4.55 (1.33)	4.28 (.96)
3	4.19 (1.21)	3.83 (1.31)	4.28 (1.06)	4.00 (1.24)	4.58 (1.35)	4.37 (1.14)	4.96 (1.30)	4.65 (.84)
4	3.30 (1.05)	3.33 (1.12)	3.43 (.93)	3.20 (.94)	4.24 (1.26)	4.14 (1.09)	4.45 (1.19)	4.02 (.91)
5	3.45 (1.15)	3.00 (.97)	2.91 (.91)	2.80 (1.14)	4.63 (1.26)	4.00 (1.14)	4.70 (1.14)	4.07 (.88)
Total	3.75 (.79)	3.12 (.89)	3.64 (.73)	3.49 (.89)	4.54 (1.12)	4.37 (1.03)	4.57 (1.05)	4.16 (0.72)

[Figure legends]

Figure 1. Sample stimuli (model 1) used in Experiment 1 (KDEF image id: BM08NEHL, BM08NEHR, BM08HAHL, and BM08HAHR).

Figure 2. The perceived model attractiveness in Experiment 1. *Note*: Left face and right face in the figure indicate the original orientation of the models' face. Error bars indicate standard errors.

Figure 3. The face stimuli used in Experiment 2. *Note*: Face images in the figure are blurred for copyright reasons; Note that in the experiment, the images were not blurred.

Figure 4. The perceived attractiveness of the model's face showing the left cheek vs. the right cheek in Experiment 2. *Note*: Error bars indicate standard errors.

Figure 5. The advertising stimuli used in Experiment 3.

Figure 6. The perceived attractiveness of the model's face showing the left cheek vs. the right cheek in Experiment 3. *Note*: Error bars indicate standard errors.

Figure 7. The results of the mediation analysis in Experiment 3.

Figure 8. The four pairs of advertising comparison stimuli used in Experiment 4.

Figure 9. The results of the mediation analysis in Experiment 5.