Two Faces of Attractiveness: Making Beauty in Averageness Appear and Reverse

Jamin Halberstadt, Diane Pecher, René Zeelenberg, Laurent Ip Wai and Piotr Winkielman

Psychological Science 2013 24: 2343 originally published online 6 September 2013
DOI: 10.1177/0956797613491969

Short Report

Psychological Science
24(11) 2343–2346

DOI: 10.1177/0956797613491969
pss.sagepub.com

Two Faces of Attractiveness: Making Beauty in Averageness Appear and Reverse

Jamin Halberstadt[1], Diane Pecher[2], René Zeelenberg[2], Laurent Ip Wai[1], and Piotr Winkielman[3]
[1]University of Otago, [2]Erasmus University Rotterdam, and [3]University of California, San Diego

Received 9/10/12; Revision accepted 4/11/13

Psychological research shows clearly that average faces are attractive. Faces generally become more attractive when they are blended (morphed) with other faces (Langlois & Roggman, 1990) or when they are distorted toward the population average (Rhodes & Tremewan, 1996), and natural variations in averageness strongly predict attractiveness (Halberstadt, 2006; Light, Hollander, & Kayra-Stuart, 1981; Rhodes, Sumich, & Byatt, 1999). Rarely has a psychological phenomenon been demonstrated to be so robust; indeed, to our knowledge, no published study has indicated that averaging produced a face that was *less* attractive than the original faces from which it was generated.

However, the beauty-in-averageness effect is highly counterintuitive when one considers the nature of morphed faces. As equal parts of two distinct individuals, morphed faces are maximally ambiguous regarding identity (see Fig. 1a for an example), and many theories associate ambiguity with negative affect. For example, research on processing fluency has shown that difficult-to-categorize stimuli are judged negatively (e.g., Reber, Schwarz, & Winkielman, 2004; Winkielman, Halberstadt, Fazendeiro, & Catty, 2006). In particular, dot patterns that deviate more from the prototypes from which they were generated are harder to classify (cf. Posner & Keele, 1968) and are less attractive (Winkielman et al., 2006). Moreover, the first effect, classification difficulty, explains the second, greater attractiveness (Winkielman et al., 2006). Because facial morphs also deviate from the original faces from which they were generated, and are also hard to classify, this logic predicts that morphs should be less, not more, attractive than the original faces.

However, a critical factor in studies showing dislike for distorted stimuli is that participants know what the stimuli are distortions of. In contrast, in studies of the beauty-in-averageness effect, the original faces are generally not known or not recognizable in the blend, which precludes any classification disfluency. This logic generates an interesting prediction: Morphs should be more attractive when their constituent faces are unknown but less attractive when the constituent faces are known and recognizable in the blend. In the current study, we tested this hypothesis by asking participants from two nations to judge morphs of local celebrities (i.e., people famous in one, but not the other, country). We expected that blends of other-country (unknown) celebrities would be more attractive (the beauty-in-averageness effect), but that blends of within-country celebrities would be less attractive, compared with the original faces from which they were generated.

Method

Participants

Fifty-two students from Erasmus University Rotterdam in The Netherlands and 60 students from the University of Otago in New Zealand participated for course credit.

Stimuli

Pictures of 28 famous Dutch persons and 28 famous New Zealanders were selected on the basis of a pilot study. These people (television, sports, and political personalities) were well known in The Netherlands but virtually unknown in New Zealand, or vice versa. Morpheus software was used to create 14 Dutch and 14 New Zealander morphs, by blending pairs of faces of the same nationality, gender, and general appearance (each face was used exactly once), and removing minor morphing artifacts

Corresponding Authors:
Jamin Halberstadt, Department of Psychology, University of Otago, P. O. Box 56, Dunedin, New Zealand 9054
E-mail: jhalbers@psy.otago.ac.nz

Piotr Winkielman, Department of Psychology, University of California, San Diego, 9500 Gilman Dr., La Jolla, CA 92093-0109
E-mail: pwinkiel@ucsd.edu

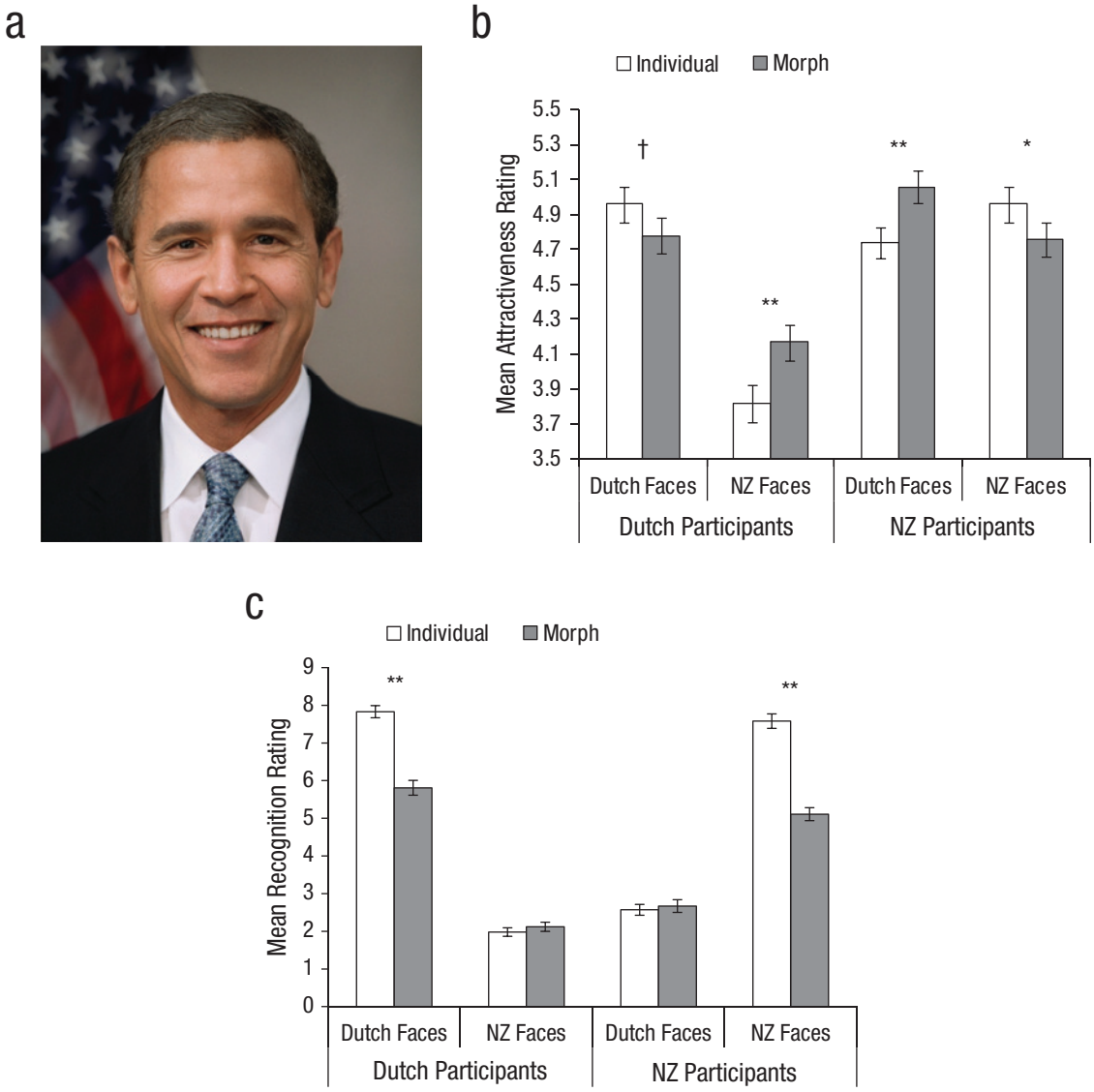

Fig. 1. Example of a morph (not used in the study) of two well-known faces (George W. Bush and Barack Obama; a) and mean attractiveness ratings (b) and recognition ratings (c) of the faces tested, as a function of nationality of the celebrity (New Zealander, NZ, vs. Dutch), nationality of the participant (NZ vs. Dutch), and face type (original vs. morph). Error bars represent standard errors of the mean. The significance of paired *t* tests comparing face types is indicated ($^{\dagger}p = .07$, $^{*}p < .05$, $^{**}p \leq .001$).

using Photoshop. The final images were 300 × 500 pixels and had a resolution of 72 dots per inch.

Procedure

Participants were run in groups of 1 to 10 at their respective universities in The Netherlands and New Zealand. Stimuli were presented on individual PCs running E-Prime (Schneider, Eschman, & Zuccolotto, 2001). Participants rated the attractiveness of all 28 morphs (14 derived from Dutch faces and 14 derived from New Zealanders' faces) and then were shown the stimuli a second time to judge "if you have ever seen this person BEFORE you started the experiment." The entire procedure was then repeated for the 56 original faces (28 Dutch persons and 28 New Zealanders). All stimuli were presented in a different random order for each task and each participant; the interstimulus interval was 100 ms. Participants used a computer mouse to rate the stimuli on appropriately anchored scales from 1 to 9.

Results[1]

A 2 (face type: original vs. morph) × 2 (celebrity's nationality: New Zealander vs. Dutch) × 2 (participant's nationality: New Zealander vs. Dutch) mixed-model analysis of variance on attractiveness ratings revealed the predicted three-way interaction, $F(1, 110) = 77.04$, $p < .001$, $\eta_p^2 = .41$. As shown in Figure 1b, Dutch participants rated morphs of New Zealander celebrities as more attractive, but morphs of Dutch celebrities as less attractive, than the original individual faces. The pattern was precisely the opposite for New Zealanders, who rated morphs of New Zealander celebrities as less attractive, but morphs of Dutch celebrities as more attractive, than the original individual faces. Both two-way interactions were highly significant, $F(1, 51) = 36.87$, $\eta_p^2 = .42$, for Dutch participants and $F(1, 59) = 40.20$, $\eta_p^2 = .41$, for New Zealanders, both ps $< .001$.

A corresponding analysis conducted on the recognition data also indicated a three-way interaction, $F(1, 110) = 435.55$, $p < .001$, $\eta_p^2 = .80$. However, as shown in Figure 1c, the interaction was due to the fact that within each participant sample, in-group celebrities were more recognizable than their morphs, but out-group celebrities and *their* morphs were equally (un)recognizable.

For an initial examination of the role of recognition in the effects of morphing, we calculated within each participant sample the correlation between mean recognition of that nation's celebrities and the morphing advantage for those celebrities in terms of attractiveness ratings (i.e., each participant's mean attractiveness rating for morphs of the faces minus his or her mean attractiveness rating for the original faces). These analyses confirmed that the more participants recognized their local celebrities, the less attractive they found the morphs of those celebrities, rs $= -.32$ and $-.28$ for Dutch participants and New Zealanders, respectively, ps $< .05$. (The same relation did not hold, and theoretically should not have held, for foreign celebrities, for whom any recognition was likely illusory.) These data suggest that recognition, not celebrity status per se, was the critical moderator of the beauty-in-averageness effect.

Discussion

The results provide a major qualification of the beauty-in-averageness effect, showing that the very same face blends can be either more or less attractive than the constituent faces depending on whether the constituents are identifiable. One potential explanation for both effects is processing fluency, in that a morphed face represents a good and fluently processed example of a "face," but a poor and disfluently processed example of either of the individual faces from which it was created. Fluent and disfluent processing could in turn produce positive and negative affect, respectively, that generalizes to the attractiveness of the blends themselves.

As a naturalistic existence proof, the current study was not designed to test the role of processing fluency directly, but response times on the recognition task, which were gathered alongside the recognition ratings themselves, offer some insight into process. Analysis of these data revealed that participants were (unsurprisingly) faster to judge local celebrities than foreign celebrities, $p < .001$, but slower to judge local-celebrity morphs than foreign-celebrity morphs, $p < .05$. Although these response times do not exclusively reflect the effort required to process the faces, they are clearly consistent with a fluency account, according to which blends of unknown faces should be easy to judge, whereas blends of recognizable faces should be difficult.

In contrast, some obvious alternative accounts cannot explain the totality of the data. For example, if one assumes that the experience of recognition is positive in itself (Gordon & Holyoak, 1983; Ramachandran & Hirstein, 1999; Zajonc, 1998), the intensity of that positivity should vary with the likelihood of recognition, thereby rendering faces less attractive when they are morphed than when their identity is clear. Such an account might explain the unattractiveness of morphed local celebrities, but not the increased attractiveness of those same morphs when the celebrities are unknown to the perceivers.

Alternatively, if one assumes that local celebrities are viewed positively, and that affect generalizes to category exemplars in proportion to their similarity to the category prototype (Fiske, 1982), it could be argued that "weaker" (i.e., blended) versions of local celebrities might elicit less positive affect than the original, "pure" versions. Once again, this account explains only half the data, failing to predict the increased attractiveness of morphs of unknown celebrities. Furthermore, the account incorrectly predicts that, independently of familiarity, the attractiveness of morphs should vary with the attractiveness of the individual faces used to generate them. Indeed, no covariate of celebrity (e.g., participants' prior attitudes toward the celebrities, media-gleaned knowledge) elegantly predicts the complex pattern of results we obtained. Nevertheless, further research experimentally manipulating fluency will be necessary for a full understanding of the experience-based reversal of the beauty-in-averageness effect we observed. To that end, Halberstadt and Winkielman (in press) recently found that the preference for morphed faces—including blends of different races—can be reduced by requiring participants to explicitly classify them into component categories, which makes blends difficult to process. Whatever the final mechanistic account, however, the

current results are likely to have general implications, in a variety of domains, for how people respond to stimuli with ambiguous category membership.

Author Contributions

J. Halberstadt, D. Pecher, R. Zeelenberg, and P. Winkielman developed the study's concept collaboratively. J. Halberstadt and L. Ip Wai collected data in New Zealand, and D. Pecher and R. Zeelenberg collected data in The Netherlands, using a program developed by D. Pecher. Data were initially analyzed by J. Halberstadt and L. Ip Wai, with assistance and input from all the other authors. J. Halberstadt drafted the initial manuscript, and all authors edited and approved the final version submitted for publication.

Declaration of Conflicting Interests

The authors declared that they had no conflicts of interest with respect to their authorship or the publication of this article.

Supplemental Material

Additional supporting information may be found at http://pss.sagepub.com/content/by/supplemental-data

Note

1. Complete statistics for analyses of the attractiveness and recognition ratings are reported in the Supplemental Material available online.

References

Fiske, S. T. (1982). Schema-triggered affect: Applications to social perception. In M. S. Clark & S. T. Fiske (Eds.), *Affect and cognition: The Seventeenth Annual Carnegie Symposium on Cognition* (pp. 55–78). Hillsdale, NJ: Erlbaum.

Gordon, P. C., & Holyoak, K. J. (1983). Implicit learning and generalization of the "mere exposure" effect. *Journal of Personality and Social Psychology*, *45*, 492–500.

Halberstadt, J. B. (2006). The generality and ultimate origins of the attractiveness of prototypes. *Personality and Social Psychology Review*, *10*, 166–183.

Halberstadt, J. B., & Winkielman, P. (in press). Easy on the eyes, or hard to categorize: Classification difficulty decreases the appeal of facial blends. *Journal of Experimental Social Psychology*.

Langlois, J. H., & Roggman, L. A. (1990). Attractive faces are only average. *Psychological Science*, *1*, 115–121.

Light, L. L., Hollander, S., & Kayra-Stuart, F. (1981). Why attractive people are harder to remember. *Personality and Social Psychology Bulletin*, *7*, 269–276.

Posner, M. I., & Keele, S. W. (1968). On the genesis of abstract ideas. *Journal of Experimental Psychology*, *77*, 155–158.

Ramachandran, V. S., & Hirstein, W. (1999). The science of art: A neurological theory of aesthetic experience. *Journal of Consciousness Studies*, *6*, 15–51.

Reber, R., Schwarz, N., & Winkielman, P. (2004). Processing fluency and aesthetic pleasure: Is beauty in the perceiver's processing experience? *Personality and Social Psychology Review*, *8*, 364–382.

Rhodes, G., Sumich, A., & Byatt, G. (1999). Are average facial configurations attractive only because of their symmetry? *Psychological Science*, *10*, 52–58.

Rhodes, G., & Tremewan, T. (1996). Averageness, exaggeration, and facial attractiveness. *Psychological Science*, *7*, 105–110.

Schneider, W., Eschman, A., & Zuccolotto, A. (2001). *E-Prime user's guide*. Pittsburgh, PA: Psychology Software Tools.

Winkielman, P., Halberstadt, J., Fazendeiro, T., & Catty, S. (2006). Prototypes are attractive because they are easy on the mind. *Psychological Science*, *17*, 799–806.

Zajonc, R. B. (1998). Emotions. In D. T. Gilbert, S. T. Fiske, & G. Lindzey (Eds.), *The handbook of social psychology* (pp. 591–632). Boston, MA: McGraw-Hill.