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The perception of attractiveness and trustworthiness in male faces affects hypothetical voting decisions differently in wartime and peacetime scenarios

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Facial appearance of candidates has been linked to real election outcomes. Here we extend these findings by examining the contributions of attractiveness and trustworthiness in male faces to perceived votability. We first use real faces to show that attractiveness and trustworthiness are positively and independently related to perceptions of good leadership (rating study). We then show that computer graphic manipulations of attractiveness and trustworthiness influence choice of leader (Experiments 1 and 2). Finally, we show that changing context from wartime to peacetime can affect which face receives the most votes. Attractive faces were relatively more valued for wartime and trustworthy faces relatively more valued for peacetime (Experiments 1 and 2). This pattern suggests that attractiveness, which may indicate health and fitness, is perceived to be a useful attribute in wartime leaders, whereas trustworthiness, which may indicate prosocial traits, is perceived to be more important during peacetime. Our studies highlight the possible role of facial appearance in voting behaviour and the role of attributions of attractiveness and trust. We also show that there may be no general characteristics of faces that make them perceived as the best choice of leader; leaders may be chosen because of characteristics that are perceived as the best for leaders to possess in particular situations.

Keywords: Social cognition; Elections; Leadership; Vote; War/peace; Attractiveness; Trustworthiness.

Leaders are ubiquitous in human populations. Here we examine how facial appearance may influence an individual's choice of leader. In previous studies, for example, physical appearance as seen in videotaped mock election speeches has been found to influence ratings of leadership ability (Cherulnik, 1995). Visual characteristics, and more specifically facial appearance, are thought to play an important role

in a variety of judgements and decisions that have real occupational outcomes in many settings. We focus on two aspects of faces that are likely to be valued traits in leaders: attractiveness and perceived trustworthiness. Leaders are generally chosen and enjoy high status within a group, potentially guiding collective action. Previous research on status has distinguished between two forms of

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status: (a) prestige, which results in freely conferred status, and (b) dominance, by which status is acquired forcefully (Henrich & Gil-White, 2001). In examining voting behaviour, we focus explicitly on ideas of freely conferred status.

There are several reasons why individuals may desire their leaders to be facially attractive. Facial attractiveness may signal biological quality (e.g., a strong immune system, Thornhill & Gangestad, 1999). Facial attractiveness has been linked with longevity (Henderson & Anglin, 2003), strong immune responses (Rantala et al., 2012), and heterozygosity in immune function genes that are associated with healthier immune systems (Roberts et al., 2005). Aspects of faces associated with attractiveness have also been found to be associated with actual health records in men (Rhodes, Chan, Zebrowitz, & Simmons, 2003) and self-reported measures of health in both men and women (Thornhill & Gangestad, 2006). Additionally, attractiveness is associated with a variety of positive personality attributions (Eagly, Ashmore, Makhijani, & Longo, 1991) and the assumption of positive personality traits may lead individuals to value attractive leaders if such traits in leaders are perceived as being beneficial to the group. Attractiveness is then a trait that is likely to be valued in potential leaders because such leaders may be (a) fit and healthy and (b) seen to possess personality traits that would be beneficial to the group that they lead.

Many studies demonstrate agreement on judgements of facial attractiveness and personality (Perrett et al., 1998; Zebrowitz, 1997) and there is evidence that attractive individuals are more likely to be hired for jobs than less attractive individuals (Chiu & Babcock, 2002; Marlowe, Schneider, & Nelson, 1996). Previous work has also suggested that "voters vote beautiful" (Efran & Patterson, 1974), with voters favouring attractive over less attractive candidates. Indeed, at least one study has shown positive relationships between rated physical attractiveness and perception of leadership competence (Surawski & Ossoff, 2006). Another study also shows that attractive political candidates are evaluated more positively than unattractive individuals (Budesheim & Depaola, 1994).

Motion has also been found to affect voting preferences. Although attractiveness was linked to votes, health ratings were a better predictor of voting based on stick figure motion (Kramer, Arend, & Ward, 2010). Studies of real voting behaviour, however, have demonstrated mixed results for the relationship between attractiveness and votes (Leigh & Susilo, 2009).

There are also several reasons to desire a leader to be trustworthy. Trustworthiness is an interesting variable as it subsumes trust in the ability and competence of an individual but also their integrity and benevolence. Followers are likely to generally desire their leaders to act in the best interest of the group and not to pursue their own selfish goals while acting in a leadership capacity. Followers are also likely to expect that their leaders can be trusted to perform their job adequately and hence possibly have the skills/intelligence for the task in hand. Trust then could be critical in judging candidate leaders. Being perceived as trustworthy is beneficial to leaders. An important aspect of a leader's effectiveness is related to the degree to which subordinates and coworkers trust them (Burke, Sims, Lazzara, & Salas, 2007). Indeed a leader's ability to retain leadership is linked to having trust from their followers (Gomibuchi, 2004). Leadership perception is also tied to traits that may be related to trustworthiness. One study examining many previous studies of leadership highlights the role of positive personality traits in leader choice, finding that leadership correlated with initiative taking, intelligence, specific task competencies and indicators of generosity (Van Vugt, 2006). These factors seem directly related to being able to trust that leaders can perform their function and that they will put group interests over selfish interests. Other studies of leadership also highlight integrity. For example, if leaders are seen as unbiased then their judgements are considered more fair and generate more positive feelings than if leaders are thought to be biased (De Cremer, 2004).

That we may expect certain aspects of facial appearance to influence leadership choice and voting behaviour raises the question of whether appearance can affect real election outcomes. It has been demonstrated that ratings of competence

in a large sample of head shot images of politicians are related to the outcome of actual US congressional elections (Todorov, Mandisodza, Goren, & Hall, 2005) and that such correlations are found based on only minimal exposure to faces (Ballew & Todorov, 2007). A similar finding based on 11 pairs of photographs from newspapers in Australia has also been reported (Martin, 1978). A further study has presented evidence that elections can be predicted by individuals voting based on facial shape alone using presidential and prime ministerial elections from several nations (Little, Burriss, Jones, & Roberts, 2007). These findings all link physical appearance to actual election outcome. Recent work has also shown that judgments from both American and Japanese raters predict real votes of American politicians, suggesting cross-cultural agreement on the power of faces in election (Rule et al., 2011).

The findings described above suggest that facial appearance affects both hypothetical and real leadership choice. One question raised is whether the same face traits are valued in all leadership situations. While it is likely that certain traits are important in almost all leadership decisions, it is possible that different faces indicate different traits that may be more or less important according to current circumstances. Previous work has indeed highlighted that competencies for specific tasks are important in evaluating leadership abilities (Van Vugt, 2006). Such context-dependent variability in choice is a common feature in other human preference research examining mate choice (Little, Burt, Penton-Voak, & Perrett, 2001; Little, Jones, Penton-Voak, Burt, & Perrett, 2002; Little, Penton-Voak, Burt, & Perrett, 2002). One study has shown that masculinity in faces is related to voting differently under wartime and peacetime scenarios (Little et al., 2007). Dominant appearance is related to occupational status in certain settings. For example, facial dominance of the graduates from the West Point Military Academy in 1950 predicted their final rank at the end of their careers (Mazur, Mazur, & Keating, 1984). Dominant individuals may be valued under certain conditions, such as in times of intergroup conflict when their physical

dominance may prove useful. During a time of war, a dominant-appearing leader may inspire confidence and intimidate enemies. However, dominance may not always be a valued trait in leaders. During peacetime, dominance is likely not to be such a useful trait; when negotiation and diplomacy are needed, interpersonal skills may outweigh the value of a dominant leader. In line with these ideas, it has been demonstrated that masculine-faced leaders are favoured in wartime scenarios while feminine-faced leaders are favoured in peacetime scenarios (Little et al., 2007). Consistent with findings from the visual domain, lower pitched, more masculine, male politician voices are favoured in hypothetical voting decisions over higher pitched, more feminine voices (Tigue, Borak, O'Connor, Schandl, & Feinberg, 2012). This study also demonstrated that sensitivity to vocal cues to dominance was heightened during wartime scenarios (Tigue et al., 2012).

The current study looked to expand on research on voting behaviour being influenced by facial appearance by examining hypothetical voting related to perceived attractiveness and trustworthiness. We examined relationships among these traits in real faces by having faces rated for attractiveness, trustworthiness, masculinity and votability (preliminary rating study). Using these ratings, we made composite stimuli of faces capturing perceived attractiveness and trustworthiness (Benson & Perrett, 1991; Tiddeman, Burt, & Perrett, 2001) to examine, experimentally, whether individuals would vote preferentially for faces manipulated to possess high or low attractiveness and high or low trustworthiness. As war- and peacetime scenarios have been found to influence voting for masculine/feminine faces (Little et al., 2007), we also examined the effects of context (wartime versus peacetime) on voting for attractive versus unattractive and trustworthy versus untrustworthy face shapes (Experiment 1A, Experiment 2). As attractiveness is linked to health, and trustworthiness is linked to prosocial characteristics, we predicted that attractiveness will be favoured under wartime conditions, while trustworthiness will be favoured under peacetime conditions.

One key aspect of the current study is to control for the effects of interrelated variables on voting

perceptions of faces. For example, masculine faces appear not only dominant but also untrustworthy (Perrett et al., 1998). Other studies highlight the potential for confounding rated variables. For example, physical attractiveness has been shown to positively influence both ratings of trustworthiness and those of leadership ability (Surawski & Ossoff, 2006), and therefore trustworthiness may not be independent of attractiveness in predicting rated leadership ability. This potentially means that the links between attractiveness and leadership ability that were seen in previous studies may be mediated by perceived trustworthiness and/or that the link between trustworthiness and leadership ability may be mediated by perceived attractiveness. We examined the independent contributions of attractiveness and trustworthiness to votability by using linear regression to control for other traits, including facial masculinity (preliminary rating study, Experiment 2).

PRELIMINARY RATING STUDY

Here we examined ratings of attractiveness, trustworthiness, masculinity and votability in relation to real face photographs to examine the interplay amongst these traits.

Method

Participants

Photographs. A total of 83 men (aged 18–29 years, mean = 20.9, $SD = 1.8$) were photographed.

Ratings. Different groups of participants rated each trait. Only women rated the men's faces for attractiveness. Fifteen individuals (10 women, 5 men, aged 18–33 years, mean = 23.1, $SD = 4.3$) rated the faces for trustworthiness. Twenty individuals (6 women, 14 men, aged 20–44 years, mean = 29.2, $SD = 7.4$) rated the faces for masculinity. Ten individuals (6 women, 4 men, aged 17–37 years, mean = 25.5, $SD = 6.9$) rated the faces for votability. Twelve women (aged 17–33 years, mean = 25.2, $SD = 5.4$) rated the faces for attractiveness.

Photography and stimuli

Full-frontal colour facial photographs were taken of all participants under standardized diffuse lighting conditions and against a constant background. Participants were asked to pose with a neutral facial expression and were asked to pull their hair back from their face. Participants were also asked to remove any spectacles, and participants with beards were excluded from the sample.

The outline of the face was marked, and this information was used to mask the image to exclude hair and other nonfacial information from the image. Similarly masked faces can be seen in later figures.

Procedure for ratings

Participants were asked to rate the 83 faces for the four traits: attractiveness, trustworthiness, masculinity, and votability. Exact questions were: "How attractive is this person?", "How trustworthy is this person?", "How masculine is this person?", and "Rate the person for how likely you would be to vote for them in an election". Ratings were made on a seven-point scale (1 = low, 7 = high). Faces were presented to participants on a computer screen individually and in a random order. Rating the face from 1–7 and pressing "enter" brought up the next face. There was no time limit for the ratings.

Results

Reliability analyses with Cronbach's alpha revealed reasonable agreement amongst raters for each trait: trustworthiness ($\alpha = .65$), attractiveness ($\alpha = .83$), masculinity ($\alpha = .86$), and votability ($\alpha = .61$). Ranges, means, and standard deviations for the ratings can be seen in Table 1.

We examined interrelationships amongst these traits using Pearson product moment correlations. Votability was significantly and positively related to ratings of both attractiveness ($r = .372$, $p < .001$) and trustworthiness ($r = .429$, $p < .001$). It was also positively, but not significantly, related to ratings of masculinity ($r = .187$, $p = .091$). Other variables were also correlated; attractiveness was positively correlated with both

Table 1. Range, means, and standard deviations of ratings for the preliminary study

Trait	Rating			SD
	Min.	Max.	Mean	
Attractiveness	1.40	5.30	2.44	0.74
Masculinity	3.05	5.57	4.05	0.55
Trustworthiness	2.39	4.57	3.61	0.50
Votability	2.30	4.40	3.21	0.49

Note: Min. = minimum. Max. = maximum. *SD* = standard deviation.

masculinity ($r = .321$, $p = .003$) and trustworthiness ($r = .372$, $p = .001$), and trustworthiness was negatively correlated with masculinity ($r = -.273$, $p = .012$). We note that, while significantly correlated, the shared variance between trustworthiness and attractiveness is relatively low ($r^2 = .14$), suggesting that trustworthiness and attractiveness ratings are not synonymous.

In order to test for possible independent contributions of attractiveness, trustworthiness, and masculinity ratings to perceptions of votability, we conducted a linear regression analysis with votability as the dependent variable and attractiveness, trustworthiness, and masculinity as the independent predictor variables. This revealed an overall significant model, $F(3, 79) = 22.61$, $p < .001$, $r^2 = .462$, in which attractiveness ($\beta = 0.516$, $p < .001$) and trustworthiness ($\beta = 0.262$, $p = .010$) were significant independent predictors of votability. Masculinity ratings did not predict perceptions of votability in this model ($\beta = 0.093$, $p = .345$).

EXPERIMENT 1A

The preliminary rating study demonstrated that, although significantly and positively correlated, trust and attractiveness had independent effects on votability ratings. In previous studies, computer graphic methods have been used to define and manipulate certain face traits. Such methods allow defined traits to be easily visualized and can reduce the number of images that are required to

present to participants in order to examine the effect traits have on perception. In Experiment 1A, we defined attractive versus unattractive and trustworthy versus untrustworthy face traits using data from the preliminary rating study to examine their impact on hypothetical voting behaviour.

Method

Participants

A total of 98 individuals (48 female, 50 male, aged 18–55 years, mean = 29.6, $SD = 9.7$) made forced-choice decisions for the voting judgements.

Stimuli

We used rating data from the preliminary rating study. To create high and low perceived attractiveness and trustworthiness composite images, we averaged the 15 faces with the highest and lowest scores for each trait. Fifteen faces was deemed sufficient to capture the average configuration of high and low individuals, as the perception of individuality or distinctiveness in composite images changes little after the merging of 6 images (Little & Hancock, 2002). For attractiveness, the mean difference between the highest rated 15 and lowest rated 15 was 1.44 (low mean = 2.85, $SD = 0.20$, high mean = 4.29, $SD = 0.15$), and this difference was significant using an independent-samples t test, $t(29) = 29.98$, $p < .001$. For trustworthiness, the mean difference between the highest rated 15 and lowest rated 15 was 1.67 (low mean = 1.77, $SD = 0.14$, high mean = 3.44, $SD = 0.44$), and this difference was also significant using an independent-samples t test, $t(29) = 14.05$, $p < .001$.

For each set of 15 face images, a single composite face was produced. The composite faces were created using specially designed software. Key locations (174 points) were manually marked around the main features (e.g., points outline, eyes, nose, and mouth) and the outline of each face (e.g., jaw line, hair line). The average location of each point in the 15 faces for each composite was then calculated. The features of the individual faces were then morphed to the relevant average shape before superimposing the images to produce a

photographic-quality result (for more information on this technique see Tiddeman et al., 2001).

To create the test, 5 composite face images were manipulated to appear more or less attractive/trustworthy. Base faces were composites of 5 random images made using the method outlined above. Each base face was transformed using the linear shape difference between the low and high attractive/trustworthy composites. Transformations were based on -50% and $+50\%$ of the difference between the composites, following methods for similar transformations of other traits such as facial masculinity (Little & Hancock, 2002; Perrett et al., 1998). Such a transform reflects mathematical computations based on the distances between the landmark points (Benson & Perrett, 1991). All images were made symmetric prior to transforming by averaging each face with its mirror reverse, (following, e.g., Perrett et al., 1999). The final set of images comprised 20 faces: 5 pairs of base faces transformed to have high and low attractiveness and the same 5 pairs of base faces transformed to have high and low trustworthiness. Example transforms are shown in Figure 1.

Procedure

A questionnaire was first administered to collect data on participant age and sex. Participants were then presented with the 10 forced-choice paired image trials. Face pairs were presented with the question: "Which person would you vote for to run your country?", and participants were asked to select the left- or right-hand face. The trials were presented in random order with the side of the screen on which each face was presented also randomized. There was no time limit for the judgements.

Results

We calculated the average number of "votes" cast for attractive or trustworthy faces by each participant as a percentage.

A mixed model analysis of variance (ANOVA) with trait (attractiveness/trustworthiness) as a within-participant factor and sex (male/female) as a between-participant factor revealed no significant main effect of trait, $F(1, 97) = 1.47$, $p = .229$,

$\eta_p^2 = .015$, no main effect of sex, $F(1, 97) = 1.65$, $p = .202$, $\eta_p^2 = .017$, and no interaction between sex and trait, $F(1, 97) = 0.39$, $p = .534$, $\eta_p^2 = .004$.

Choice of face was analysed with a one-sample t test against chance (50%), revealing that participants were more likely to "vote" for attractive faces than for unattractive faces (mean = 64.7%, $SD = 21.8$), $t(97) = 6.66$, $p < .001$, and for trustworthy than for untrustworthy faces (mean = 62.2%, $SD = 20.1$), $t(97) = 6.04$, $p < .001$. See Figure 2.

Finally, we ran Pearson product moment correlations revealing that voting for attractive faces was also positively related to voting for trustworthy faces ($r = .58$, $p < .001$). In other words, participants who showed particularly strong tendencies to vote for attractive individuals also tended to show particularly strong tendencies to vote for trustworthy individuals.

EXPERIMENT 1B

A previous study has demonstrated that voting under wartime and peacetime scenarios can change voters' opinions of who would make the best leader (Little et al., 2007). Thus, in Experiment 1B, we examined the effect of manipulating these scenarios on voting for attractive and trustworthy faces. Differences in voting for high attractiveness or trust faces across context may present further evidence that it is possible to dissociate the effects of perceptions of candidates' attractiveness and trustworthiness on hypothetical voting behaviour, as we predicted that attractiveness may be more important in wartime leaders while trustworthiness may be more important in peacetime leaders.

Method

Participants

A total of 75 individuals (37 female, 38 male, aged 18–63 years, mean = 29.6, $SD = 10.6$) made forced-choice decisions for the voting judgements.

Stimuli

The same faces were used as those in Experiment 1A.

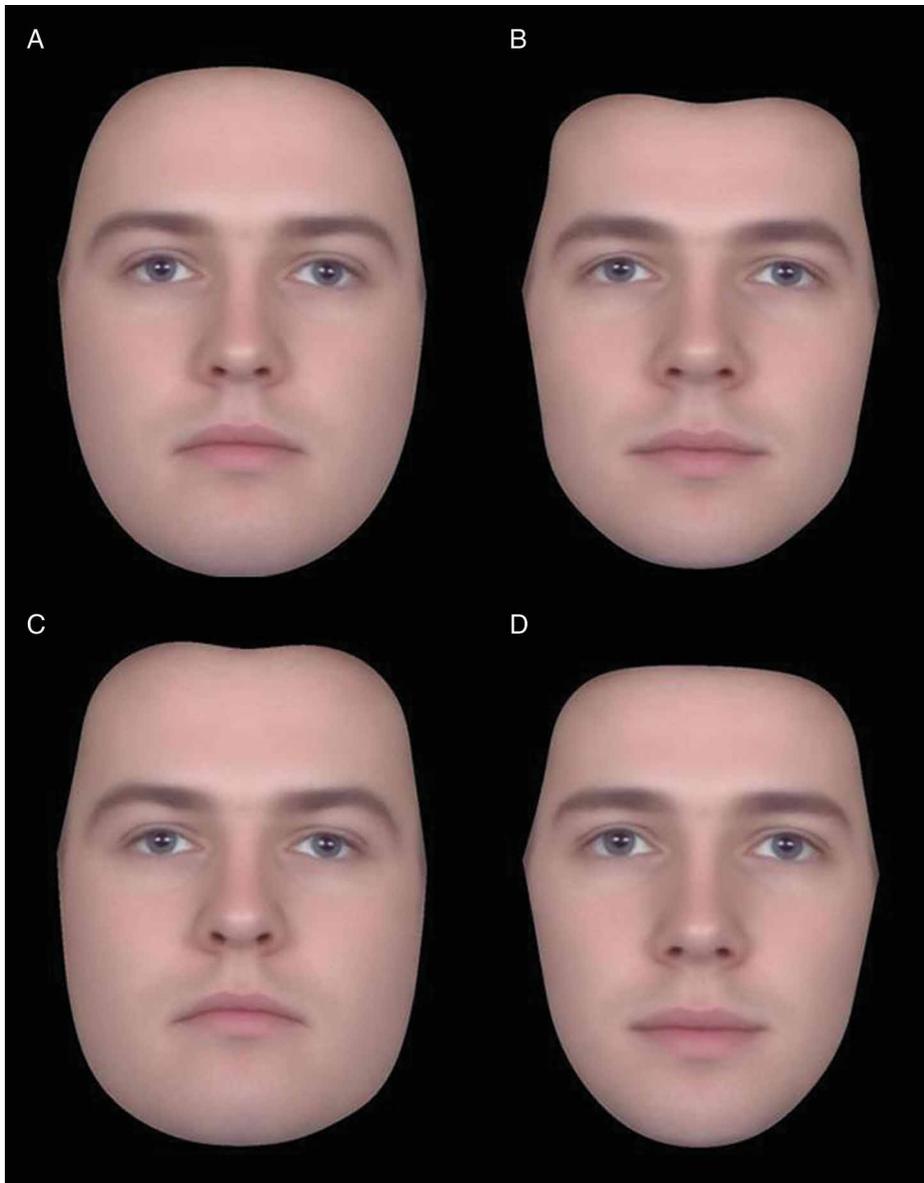


Figure 1. Example pairs of shape-transformed composites representing low attractiveness (A) and high attractiveness (B) faces and low trustworthiness (C) and high trustworthiness (D) faces used in Experiments 1A and 1B. To view a colour version of this figure, please see the online issue of the Journal.

Procedure

The procedure was identical to that of Experiment 2A except that participants voted for faces twice, once with the question “Which person would you vote for to run your country

IN A TIME OF PEACE?” and once with the question “Which person would you vote for to run your country IN A TIME OF WAR?”. Order of question was randomized for each participant.

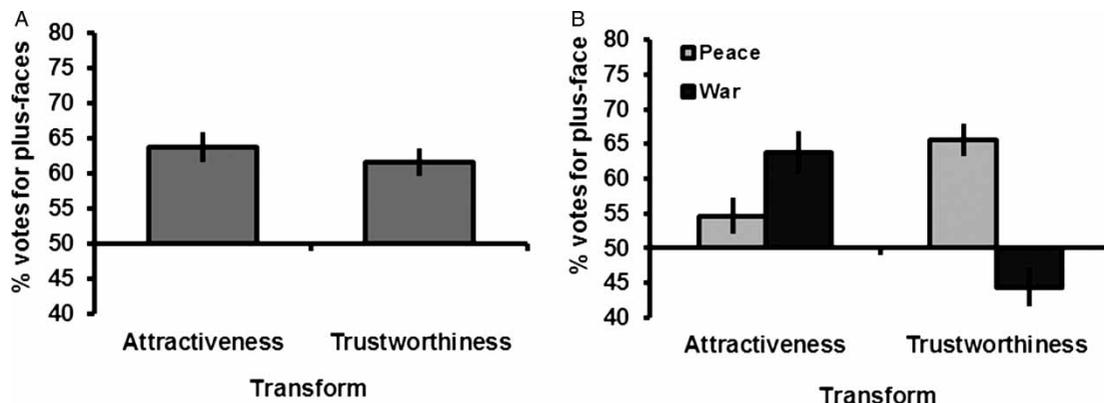


Figure 2. (A) Percentage of “votes” for plus-attractiveness and plus-trustworthy faces in Experiment 1A (± 1 SEM) and (B) Percentage of “votes” for plus-attractiveness and plus-trustworthy faces according to voting under wartime or peacetime scenarios in Experiment 1B (± 1 SEM).

Results

Again, we calculated the average number of “votes” cast for attractive or trustworthy faces by each participant as a percentage.

A mixed-model ANOVA with trait (attractive/trustworthy) and scenario (wartime/peacetime) as within-participant factors and sex (male/female) as a between-participant factor revealed a significant interaction between trait and scenario, $F(1, 73) = 48.83$, $p < .001$, $\eta_p^2 = .401$, reflecting the differences outlined below. There were main effects of both trait, $F(1, 73) = 3.50$, $p = .065$, $\eta_p^2 = .046$, and scenario, $F(1, 73) = 4.42$, $p = .039$, $\eta_p^2 = .057$, but the former did not reach significance and both were qualified by the interaction above. No other main effects or interactions were significant, all $F(1, 73) < 0.74$, $p > .391$, $\eta_p^2 < .010$.

Paired-sample t tests revealed that attractive faces were voted for significantly more in the wartime scenario than in the peacetime scenario, $t(74) = 2.56$, $p = .013$, and that trustworthy faces were voted for significantly more in the peacetime scenario than in the wartime scenario, $t(74) = 5.85$, $p < .001$. Means can be seen in Figure 2.

One-sample t tests against chance (50%) revealed that participants were significantly more likely to vote for attractive faces than for unattractive faces in the wartime scenario (mean = 63.7%,

$SD = 26.2$), $t(74) = 4.53$, $p < .001$, but the effect was not significant in the peacetime scenario (mean = 54.7%, $SD = 22.2$), $t(74) = 1.82$, $p = .073$. Participants were also more likely to vote for trustworthy than for untrustworthy faces in the peacetime scenario (mean = 65.6%, $SD = 20.7$), $t(74) = 6.51$, $p < .001$, but trustworthiness was not significantly related to voting in the wartime scenario (mean = 44.4%, $SD = 24.6$), $t(74) = 1.97$, $p = .053$, although this effect was close to being significant in the opposite direction (i.e., preference for *un*trustworthy-looking leaders).

EXPERIMENT 2

While Experiments 1A and 1B demonstrated voting differences based on attractive versus unattractive and trustworthy versus untrustworthy images, the preliminary study had demonstrated that these traits are interrelated, and so our manipulations could also reflect manipulations of the other correlated perceived traits varying in attractiveness, trust, and masculinity. In Experiment 2, we therefore constructed images that attempted to minimize these confounds so that attractiveness was manipulated independently of trustworthiness and masculinity and so that trustworthiness was manipulated independently of attractiveness and masculinity. We did this by using regression

analysis to identify faces that were high and low on the relevant traits, independent of the other traits (i.e., controlling for values on the other traits).

Method

Participants

A total of 48 individuals (22 female, 26 male, aged 17–54 years, mean = 27.8, $SD = 8.7$) made forced-choice decisions for the voting judgements.

Stimuli

All methods here were identical to those used in Experiment 1A, and the final stimuli were made from the same base faces. The only difference was how the constituent images for the high and low attractiveness and trustworthiness composites were chosen.

First, we checked for confounds in the previously used composites using ratings of their constituent faces from the rating study. These composites were potentially confounded by other perceived traits, since the images in the high and low trustworthy composites showed significant differences in rated attractiveness (low mean = 2.22, $SD = 0.61$, high mean = 2.98, $SD = 0.86$), $t(29) = 2.79$, $p = .009$, and masculinity (low mean = 4.39, $SD = 0.56$, high mean = 3.85, $SD = 0.48$), $t(29) = 2.86$, $p = .008$, and the images in the high and low attractiveness composites also showed significant differences in rated trustworthiness (low mean = 3.37, $SD = 0.49$, high mean = 3.94, $SD = 0.42$), $t(29) = 3.37$, $p = .002$, and masculinity (low mean = 3.79, $SD = 0.46$, high mean = 4.34, $SD = 0.69$), $t(29) = 2.56$, $p = .016$.

In order to remove such confounds, we used linear regression with either attractiveness or trustworthiness as the dependent variable and masculinity and the alternative trait (i.e., trustworthiness when attractiveness was the dependent variable and attractiveness when trustworthiness was the dependent variable) as independent variables. We calculated the standardized residuals for this analysis to give a measure of variation in the relevant trait independent of the two predictor traits. We sorted the images on these residuals and used this list to

determine the 15 top- and bottom-scoring images for each trait.

For the new images varying in trustworthiness, the mean difference in perceived trustworthiness between the highest rated 15 and lowest rated 15 was 1.16 (low mean = 2.94, $SD = 0.31$, high mean = 4.10, $SD = 0.27$), and this difference was significant using an independent-samples t test, $t(29) = 10.81$, $p < .001$. For the new images varying in attractiveness, the mean difference in perceived attractiveness between the highest rated 15 and lowest rated 15 was 1.69 (low mean = 1.86, $SD = 0.33$, high mean = 3.55, $SD = 0.68$), and this difference was also significant using an independent-samples t test, $t(29) = 8.66$, $p < .001$.

These composites were not confounded in the same way as previous stimuli. There were no significant differences in rated attractiveness (low mean = 2.39, $SD = 0.63$, high mean = 2.31, $SD = 0.52$), $t(28) = 0.38$, $p = .706$, or masculinity (low mean = 4.14, $SD = 0.67$, high mean = 4.13, $SD = 0.48$), $t(29) = 0.07$, $p = .948$, for the images in the new high and low trustworthy composites and no significant differences in rated trustworthiness (low mean = 3.77, $SD = 0.42$, high mean = 3.77, $SD = 0.55$), $t(28) = 0.00$, $p = 1.00$, or masculinity (low mean = 4.19, $SD = 0.52$, high mean = 4.12, $SD = 0.75$), $t(29) = 0.31$, $p = .761$, for the images in the new high and low attractiveness composites. New controlled composites can be seen in Figure 3.

Procedure

The procedure was identical to that of Experiments 1A and 1B except that participants voted for faces three times. The first was the original vote question. This was followed by the war and peace scenarios. The original question was always first, and the order of the war- and peacetime questions was randomized for each participant.

Results

Once again, we calculated the average number of “votes” cast for attractive or trustworthy faces by each participant as a percentage.

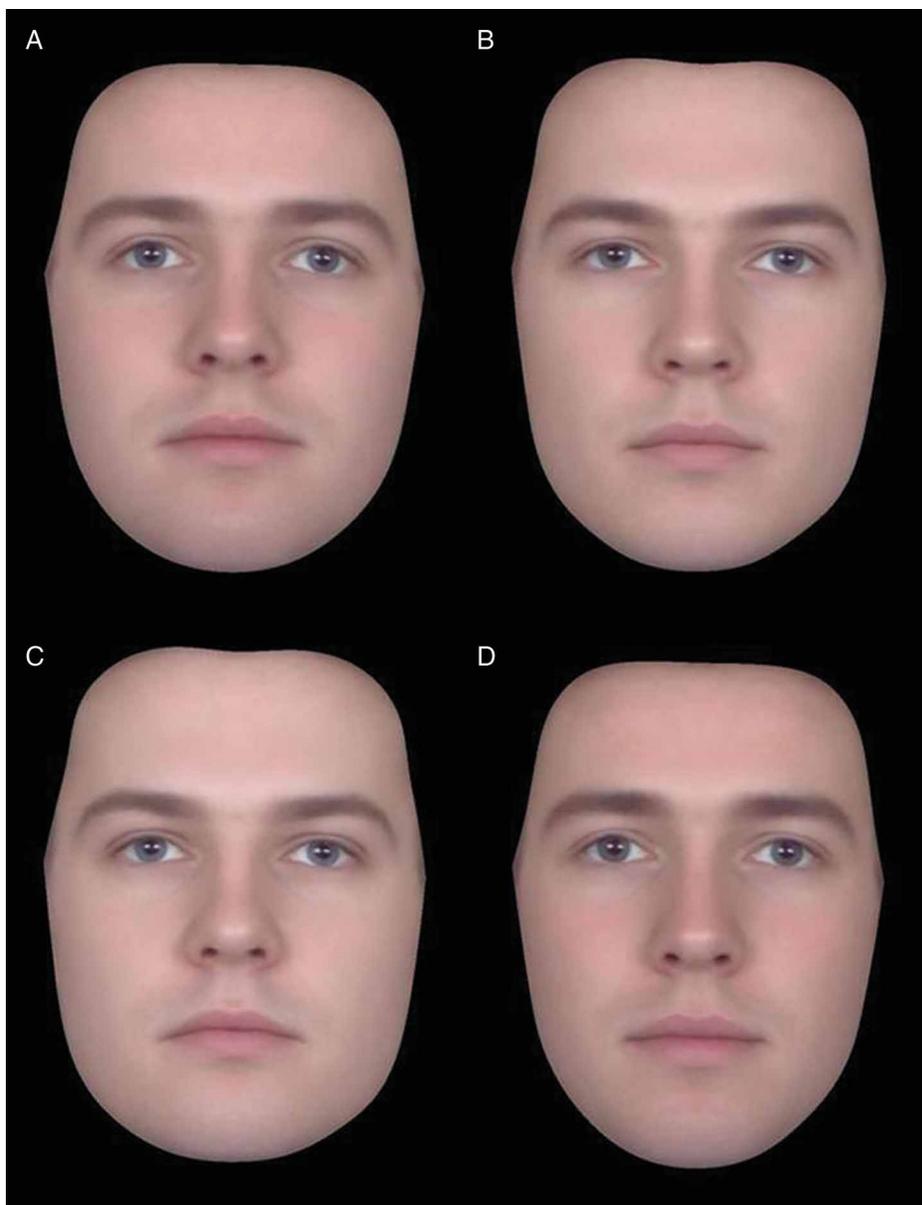


Figure 3. Example pairs of shape transformed composites representing controlled versions of low attractiveness (A) and high attractiveness (B) faces and low trustworthiness (C) and high trustworthiness (D) faces used in Experiment 2. To view a colour version of this figure, please see the online issue of the Journal.

As in Experiment 1A, one-sample t tests against chance (50%) revealed that participants were significantly more likely to vote for attractive faces than for unattractive faces (mean = 66.3%, $SD =$

22.7), $t(47) = 4.97$, $p < .001$, and more likely to vote for trustworthy than for untrustworthy faces (mean = 66.5%, $SD = 17.8$), $t(47) = 6.14$, $p < .001$.

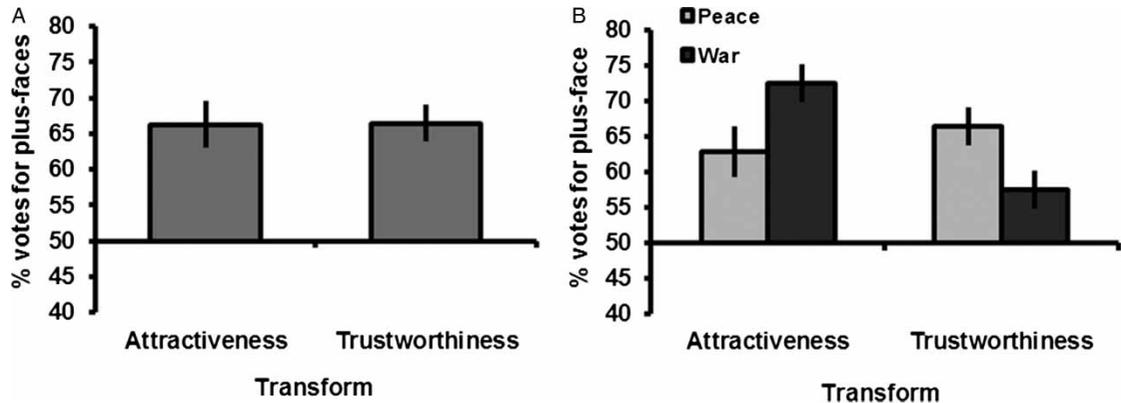


Figure 4. (A) Percentage of "votes" for controlled plus-attractiveness and plus-trustworthy faces in Experiment 2 (± 1 SEM). (B) Percentage of "votes" for controlled plus-attractiveness and plus-trustworthy faces according to voting under wartime or peacetime scenarios in Experiment 2 (± 1 SEM).

As in Experiment 1B, mixed-model ANOVA with trait (attractive/trustworthy) and scenario (wartime/peacetime) as within-participant factors and sex (male/female) as a between-participant factor revealed a significant interaction between trait and scenario, $F(1, 46) = 26.68$, $p < .001$, $\eta_p^2 = .367$, pursued below. There was a significant effect of trait, $F(1, 46) = 6.25$, $p = .016$, $\eta_p^2 = .120$, though this was qualified by the interaction above. No other main effects or interactions were significant, all $F(1, 46) < 2.13$, $p > .151$, $\eta_p^2 < .044$.

As in Experiment 1B, paired-samples t tests revealed that attractive faces were voted for significantly more in the wartime scenario than in the peacetime scenario, $t(47) = 2.76$, $p = .008$, and that trustworthy faces were voted for significantly more in the peacetime scenario than in the wartime scenario, $t(47) = 2.63$, $p = .012$. Means can be seen in Figure 4.

As in Experiment 1B, one-sample t tests against chance (50%) also revealed that participants were significantly more likely to vote for attractive faces than for unattractive faces in the wartime scenario (mean = 72.5%, $SD = 18.7$), $t(47) = 8.32$, $p < .001$, and more likely to vote for trustworthy than for untrustworthy faces in the peacetime scenario (mean = 66.5%, $SD = 18.6$), $t(47) = 6.12$, $p < .001$, scenarios. Unlike in Experiment 1B,

here attractiveness was significantly related to voting in the peacetime scenario (mean = 62.9%, $SD = 24.8$), $t(47) = 3.62$, $p = .001$, with more votes for attractive faces. Trustworthiness was significantly related to voting in the wartime scenario (mean = 57.5%, $SD = 19.0$), $t(47) = 2.74$, $p = .009$, with more votes for trustworthy faces.

DISCUSSION

Across three studies we investigated the role of facial attractiveness and trustworthiness in perceived suitability as a leader. Ratings of attractiveness and trustworthiness, while related to each other, were independent predictors of votability controlling for perceived masculinity (preliminary rating study). We also found that capturing the perceived traits in composite images and experimentally manipulating attractiveness and trustworthiness also revealed that more attractive and trustworthy faces were more likely to receive votes to be a leader (Experiment 1A). While these images captured the desired traits, these traits were also confounded with other traits. That votes for high trust and attractiveness faces were differently affected by context (Experiment 1A and 1B), however, indicates that the two traits are not valued in the same way in leaders and that

the face images were perceptually distinct in some ways. There was some cross-talk in the composites in Experiment 1B, with the images in the high attractive composite also rated as more masculine and more trustworthy than those in the low attractive composite and the images in the high trustworthiness composite also rated as more masculine and attractive than those in the low trustworthiness composite. We employed linear regression techniques to create new composite images to capture attractiveness and trustworthiness independent of other rater traits. Using these images to transform faces again confirmed that more attractive and trustworthy faces were more likely to receive votes to be a leader (Experiment 2). As well as overall votability, we also investigated facultative leader choice in war- and peacetime scenarios. Using two different types of transformed image (Experiment 1B, Experiment 2), we found that attractiveness was favoured in war time scenarios more than in peacetime scenarios and that trustworthiness was favoured in peacetime scenarios more than in wartime scenarios.

Our results complement previous findings demonstrating that aspects of facial appearance are related to real election outcomes (Little et al., 2007; Todorov et al., 2005). While previous studies have shown perceived competence to be of particular importance in predicting election outcomes while trustworthiness and likeability are not predictive (Todorov et al., 2005), here we show that both trustworthiness and attractiveness have an influence on hypothetical voting decisions. Indeed, our correlational and experimental studies also highlight the impact of facial appearance on hypothetical voting behaviour. As the individual traits of politicians become increasingly important (Caprara & Zimbardo, 2004), and with politicians' increasing use of visual media, we might expect that the appearance of candidates' faces would be likely to play a critical role in voter choice. Indeed, it has long been suggested that facial appearance may influence voting decisions, particularly since the famous televised debates between Kennedy and Nixon. In one debate, those with visual information (from television) thought that Kennedy had won the debate, while those with only auditory

information (from radio) thought that Nixon had won (Kraus, 1988).

One question raised is why individuals use perceptual traits such as attractiveness and trustworthiness to guide their choice of leaders. Decision making is often considered a complicated cognitive process (Schall, 2005). While much information underlies each important decision we make, it is also possible that we are influenced by simpler cognitive mechanisms, such as stereotyping, when making decisions under high cognitive load (Macrae, Milne, & Bodenhausen, 1994), relevant to real-world election decisions. A reliance on stereotypes may also be enhanced when there is no other information on which the decisions can be based, as was the case in the studies reported here. We acknowledge that voting decisions are dependent on many factors other than just the candidates' faces, not least of which must be the candidates' policies. It has, however, been suggested that voters may often use a simplifying cognitive strategy to code the large amount of data available to them about politicians and their personalities, as well as their policies (Caprara, Barbaranelli, & Zimbardo, 1997). As stereotypes can also represent a cognitive shortcut (Macrae et al., 1994), attributions to faces may be another way that voters discriminate between candidates when presented with an overload of information. Of course, in our study no information other than visual information was available and so social perception is likely to be particularly important. Here our interest was in uncovering what traits are important in guiding leader choice and in examining facultative leader choice. Interestingly, some studies have shown that individuals can be somewhat accurate in inferring another's personality from just their facial appearance (Little & Perrett, 2007; Penton-Voak, Pound, Little, & Perrett, 2006). Limited accuracy may help explain why individuals use facial cues such as these to help guide important decisions in the absence of other cues.

Our data suggest that attractiveness and trustworthiness both independently enhance perceptions of leadership ability. Changing context from wartime to peacetime can change the type of face that is voted for. This potentially tells us something

about why attractiveness and trustworthiness are valued as they have differential value according to the situation. As attractiveness is related to health, perhaps this explains why the trait is favoured in wartime situations. At least for motion, health perceptions are a positive predictor of voting behaviour (Kramer et al., 2010). Given that attractiveness and health are often positively linked, voting for attractiveness in the experiments here may, at least in part, reflect voting for healthy candidates. Because attractiveness is less favoured in peacetime than the prosocial caring traits associated with attractiveness seem less likely to account for the value of attractiveness in a leader. Trustworthiness was favoured in peacetime, and it is here that benefits from prosocial traits come to the fore. Trustworthiness may be less favoured under times of war; indeed, this trait may be seen as an unnecessary luxury in a wartime leader, or even a liability as a forgiving and trusting leader may be exploited in times of war. Facultative leadership is particularly interesting as it shows that individuals are making adaptive choices of leader: a healthy leader that may signal to the enemy that the nation is capable of fighting during wartime and a prosocial leader who will share the benefits of the country fairly when times are more peaceful. Our manipulation of wartime and peacetime context was relatively simple, and we left participants to interpret the meanings. We expect that individuals would interpret that peacetime leaders would need skills and abilities relevant to cooperation and negotiation while wartime leaders would need skills relevant to conflict and aggression.

The change in voting for facial shape according to war or peace context (Experiment 1B, Experiment 2) suggests that an individual's perception of the state of world politics and current events might strongly influence his or her choice of leader. Individuals appear to take into account environmental or situational cues, such as the current situational threat to their country, and select the best candidate accordingly. Our results also demonstrate flexibility of leadership choice in a way that could be regarded as adaptive. Of course modern combat removes the necessity to have a physically

competitive leader in times of war. We propose, as have others (Henrich & Gil-White, 2001), that leader choice is based on heuristics that were of use in ancestral environments. Our results could reflect the perceived best choices for small groups and small-scale intergroup conflict rather than the best choices to lead nations during times of war or peace. Additionally, the more threatening wartime scenario also may have potentially shifted individuals to focus on simpler information based on stereotypes of attractiveness rather than more complex behavioural judgements cued by trust.

One important aspect of our studies was controlling for the often confounded nature of social perception. While previous studies have shown that attractiveness is associated with increased positive ratings of leadership ability, this may have been due to relationships among attractiveness, masculinity, and trustworthiness. While our data may also be confounded with some unmeasured factor, we do demonstrate that attractiveness and trustworthiness have independent effects on votability. Our method for creating composite images that capture only certain aspects of social perception is also relatively novel (see also Todorov, Said, Engell, & Oosterhof, 2008). Generally, studies in social perception should take care to ensure some controls for potentially confounding interrelationships. Our images were of young adult men and therefore might not necessarily represent the sort of individuals that are usually voted for to run a country. We note, however, that the forced-choice nature of the tests should reveal traits that are generally considered to be useful in wartime versus peacetime leaders. There is no strong reason to believe that different face traits would be valued in older faces, although older faces themselves may be seen to make more suitable leaders. Future studies could usefully address the role that age plays in leadership choice and the possible interactions between facial age and traits conveying attractiveness, trustworthiness, health and dominance.

In summary, our studies highlight the possible role of facial appearance in voting behaviour and the role of personal attributions in face perception. Attractiveness and trustworthiness are both

independently valued traits in leader choice. We also show that there may be no general characteristics of faces that make them the perceived best choice of leader. Leaders may be chosen because the characteristics they are seen to possess are best suited to lead in particular situations.

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REFERENCES

- Ballew, C. C., & Todorov, A. (2007). Predicting political elections from rapid and unreflective face judgments. *Proceedings of the National Academy of Sciences of the United States of America*, *104*, 17948–17953.
- Benson, P. J., & Perrett, D. I. (1991). Synthesising continuous-tone caricatures. *Image Vision Computing*, *9*, 123–129.
- Budesheim, T. L., & Depaola, S. J. (1994). Beauty or the beast—The effects of appearance, personality, and issue information on evaluations of political candidates. *Personality and Social Psychology Bulletin*, *20*, 339–348.
- Burke, C. S., Sims, D. E., Lazzara, E. H., & Salas, E. (2007). Trust in leadership: A multi-level review and integration. *Leadership Quarterly*, *18*, 606–632.
- Caprara, G. V., Barbaranelli, C., & Zimbardo, P. (1997). Politicians' uniquely simple personalities. *Nature*, *385*, 493.
- Caprara, G. V., & Zimbardo, P. G. (2004). Personalizing politics—A congruency model of political preference. *American Psychologist*, *59*, 581–594.
- Cherulnik, P. D. (1995). Physical appearance, social skill, and performance as a leadership candidate. *Basic and Applied Social Psychology*, *16*, 287–295.
- Chiu, R. K., & Babcock, R. D. (2002). The relative importance of facial attractiveness and gender in Hong Kong selection decisions. *International Journal of Human Resource Management*, *13*, 141–155.
- De Cremer, D. (2004). The influence of accuracy as a function of leader's bias: The role of trustworthiness in the psychology of procedural justice. *Personality and Social Psychology Bulletin*, *30*, 293–304.
- Eagly, A. H., Ashmore, R. D., Makhijani, M. G., & Longo, L. C. (1991). What is beautiful is good, but . . . : A meta-analytic review of research on the physical attractiveness stereotype. *Psychological Bulletin*, *110*, 109–128.
- Efran, M. G., & Patterson, E. (1974). Voters vote beautiful—Effect of physical appearance on a national election. *Canadian Journal of Behavioural Science—Revue Canadienne Des Sciences Du Comportement*, *6*, 352–356.
- Gomibuchi, S. (2004). Trust and leadership. *Political Science*, *56*, 27–38.
- Henderson, J. J. A., & Anglin, J. M. (2003). Facial attractiveness predicts longevity. *Evolution and Human Behavior*, *24*, 351–356.
- Henrich, J., & Gil-White, F. J. (2001). The evolution of prestige—Freely conferred deference as a mechanism for enhancing the benefits of cultural transmission. *Evolution and Human Behavior*, *22*, 165–196.
- Kramer, R. S. S., Arend, I., & Ward, R. (2010). Perceived health from biological motion predicts voting behaviour. *Quarterly Journal of Experimental Psychology*, *63*, 625–632.
- Kraus, S. (1988). *Televised presidential debates and public policy*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Leigh, A., & Susilo, T. (2009). Is voting skin-deep? Estimating the effect of candidate ballot photographs on election outcomes. *Journal of Economic Psychology*, *30*, 61–70.
- Little, A. C., Burriss, R. P., Jones, B. C., & Roberts, S. C. (2007). Facial appearance affects voting decisions. *Evolution and Human Behavior*, *28*, 18–27.
- Little, A. C., Burt, D. M., Penton-Voak, I. S., & Perrett, D. I. (2001). Self-perceived attractiveness influences human female preferences for sexual dimorphism and symmetry in male faces. *Proceedings of the Royal Society B: Biological Sciences*, *268*, 39–44.
- Little, A. C., & Hancock, P. J. B. (2002). The role of masculinity and distinctiveness in judgments of human male facial attractiveness. *British Journal of Psychology*, *93*, 451–464.
- Little, A. C., Jones, B. C., Penton-Voak, I. S., Burt, D. M., & Perrett, D. I. (2002). Partnership status and the temporal context of relationships influence human female preferences for sexual dimorphism in male face shape. *Proceedings of the Royal Society B: Biological Sciences*, *269*, 1095–1100.
- Little, A. C., Penton-Voak, I. S., Burt, D. M., & Perrett, D. I. (2002). Individual differences in the perception of attractiveness: How cyclic hormonal changes and self-perceived attractiveness influence female preferences for male faces. In G. Rhodes & L. Zebrowitz (Eds.), *Advances in social cognition: Facial attractiveness* (Vol. 1, pp. 59–90). Westport, CT: Ablex.

- Little, A. C., & Perrett, D. I. (2007). Using composite images to assess accuracy in personality attribution to faces. *British Journal of Psychology*, *98*, 111–126.
- Macrae, C. N., Milne, A. B., & Bodenhausen, G. V. (1994). Stereotypes as energy-saving devices—A peek inside the cognitive toolbox. *Journal of Personality and Social Psychology*, *66*, 37–47.
- Marlowe, C. M., Schneider, S. L., & Nelson, C. E. (1996). Gender and attractiveness biases in hiring decisions: Are more experienced managers less biased? *Journal of Applied Psychology*, *81*, 11–21.
- Martin, D. S. (1978). Person perception and real-life electoral behavior. *Australian Journal of Psychology*, *30*, 255.
- Mazur, A., Mazur, J., & Keating, C. (1984). Military rank attainment of a West Point class: Effects of cadet's physical features. *American Journal of Sociology*, *90*, 125–150.
- Penton-Voak, I. S., Pound, N., Little, A. C., & Perrett, D. I. (2006). Personality judgments from natural and composite facial images: More evidence for a “kernel of truth” in social perception. *Social Cognition*, *24*, 607–640.
- Perrett, D. I., Burt, D. M., Penton-Voak, I. S., Lee, K. J., Rowland, D. A., & Edwards, R. (1999). Symmetry and human facial attractiveness. *Evolution and Human Behavior*, *20*, 295–307.
- Perrett, D. I., Lee, K. J., Penton-Voak, I. S., Rowland, D. R., Yoshikawa, S., Burt, D. M., et al. (1998). Effects of sexual dimorphism on facial attractiveness. *Nature*, *394*, 884–887.
- Rantala, M. J., Moore, F. R., Skrinda, L., Krama, T., Kivleniece, K., Kecko, S., et al. (2012). Evidence for the stress-linked immunocompetence handicap hypothesis in humans. *Nature Communications*, *3*, 694. doi: 10.1038/ncomms1696
- Rhodes, G., Chan, J., Zebrowitz, L. A., & Simmons, L. W. (2003). Does sexual dimorphism in human faces signal health? *Proceedings of the Royal Society B: Biological Sciences*, *270*, S93–S95.
- Roberts, S. C., Little, A. C., Gosling, L. M., Perrett, D. I., Carter, V., Jones, B. C., et al. (2005). MHC-heterozygosity and human facial attractiveness. *Evolution and Human Behavior*, *26*, 213–226.
- Rule, N. O., Arnbady, N., Adams, R. B., Ozono, H., Nakashima, S., Yoshikawa, S., et al. (2011). Polling the face: Prediction and consensus across cultures. *Journal of Personality and Social Psychology*, *98*, 1–15.
- Schall, J. D. (2005). Decision making. *Current Biology*, *15*, R9–R11.
- Surawski, M. K., & Ossoff, E. P. (2006). The effects of physical and vocal attractiveness on impression formation of politicians. *Current Psychology*, *25*, 15–27.
- Thornhill, R., & Gangestad, S. W. (1999). Facial attractiveness. *Trends in Cognitive Sciences*, *3*, 452–460.
- Thornhill, R., & Gangestad, S. W. (2006). Facial sexual dimorphism, developmental stability, and susceptibility to disease in men and women. *Evolution and Human Behavior*, *27*, 131–144.
- Tiddeman, B. P., Burt, D. M., & Perrett, D. I. (2001). Prototyping and transforming facial texture for perception research. *IEEE Computer Graphics and Applications*, *21*, 42–50.
- Tigue, C. C., Borak, D. J., O'Connor, J. J. M., Schandl, C., & Feinberg, D. R. (2012). Voice pitch influences voting behavior. *Evolution and Human Behavior*, *33*, 210–216.
- Todorov, A., Mandisodza, A. N., Goren, A., & Hall, C. C. (2005). Inferences of competence from faces predict election outcomes. *Science*, *308*, 1623–1626.
- Todorov, A., Said, C. P., Engell, A. D., & Oosterhof, N. N. (2008). Understanding evaluation of faces on social dimensions. *Trends in Cognitive Sciences*, *12*, 455–460.
- Van Vugt, M. (2006). Evolutionary origins of leadership and followership. *Personality and Social Psychology Review*, *10*, 354–371.
- Zebrowitz, L. A. (1997). *Reading faces*. Boulder, CO: WestviewPress.