

## Facial appearance affects voting decisions

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### Abstract

Human groups are unusual among primates in that our leaders are often democratically selected. Faces affect hiring decisions and could influence voting behavior. Here, we show that facial appearance has important effects on choice of leader. We show that differences in facial shape alone between candidates can predict who wins or loses in an election (Study 1) and that changing context from war time to peace time can affect which face receives the most votes (Study 2). Our studies highlight the role of face shape in voting behavior and the role of personal attributions in face perception. We also show that there may be no general characteristics of faces that can win votes, demonstrating that face traits and information about the environment interact in choice of leader.

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### 1. Introduction

Decision making is a complicated cognitive process (Schall, 2005). While many pieces of information ultimately underlie each important decision we make, it is also possible that we are influenced by simpler cognitive mechanisms, such as stereotyping, when making decisions that involve people. Here, we examine the role of visual appearance in voting for national leaders, an arena where it might be expected that physical appearance would matter little, given the wealth of information available about the participants, their parties, and their policies.

Leaders are ubiquitous in human populations, and potentially, leadership choice has a biological as well as a social basis. Visual characteristics, and more specifically facial appearance, are thought to play an important role in a variety of judgments and decisions that have real occupational outcomes in settings other than voting. Attractiveness may signal quality (Thornhill & Gangestad, 1999) and is associated with a variety of positive personality attributions (Eagly, Ashmore, Makhijani, & Longo, 1991). Attractiveness then is a trait that is likely to be valued in potential

leaders. Many studies demonstrate agreement on judgments 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).

A second major aspect of facial appearance potentially associated with leadership is facial dominance. The expression and physiognomic features associated with dominance are agreed upon cross-culturally (Keating, Mazur, & Segall, 1981a; 1981b). Dominant appearance is related to occupational status in certain settings. 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). Facial masculinity, linked to facial dominance (Perrett et al., 1998), positively relates to testosterone level (Penton-Voak & Chen, 2004), suggesting a link to actual dominant behaviour (Mazur & Booth, 1998) in dominant-faced individuals. Unlike attractiveness, dominance may not be a valued trait in leaders. Facial dominance may be linked to leadership status due to acquiescent or submissive responses by other group members rather than by group assent. In fact, masculine faces not only appear dominant but also untrustworthy (Perrett et al., 1998). Many primate societies are characterized by strict hierarchies in which physical dominance is a

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prominent determinant (Smuts, Cheney, Seyfarth, Wrangham, & Struhsaker, 1987). Humans, however, are somewhat unusual in that many societies choose their leaders democratically, leaving the potential to select individuals with prosocial skills over more physically dominant individuals. Because of this, it is difficult to predict whether dominance will be favored in leader choice. Previous research on the evolution of status has distinguished between two forms of status: (1) prestige, which results in freely conferred status, and (2) dominance, by which status is acquired forcefully (Henrich & Gil-White, 2001). In examining voting behavior, we focus explicitly on ideas of freely conferred status, and here, as dominant individuals may be valued under certain conditions, such as in times of intergroup conflict, dominance may, in fact, result in freely conferred status.

It has been suggested that facial appearance may influence voting decisions in elections, 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). This implies that visual appearance has a striking effect on what individuals think about politicians, regardless of policy and good argument. Indeed, in line with many positive attributions to attractive individuals (Dion, Berscheid, & Walster, 1972), one study shows that attractive political candidates are evaluated more positively than unattractive individuals (Budesheim & Depaola, 1994). 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 may be likely to play a critical role in voter choice.

In line with such reasoning, it has recently been demonstrated that, in a large sample of head shot images of politicians, ratings of competence are related to the outcome of actual US congressional elections (Todorov, Mandisodza, Goren, & Hall, 2005). This intriguing finding links physical appearance to election outcome, highlighting that stereotypes may indeed guide voting behavior. A similar finding based on 11 pairs of photographs from newspapers has also been shown (Martin, 1978). As faces are important social stimuli, it is likely that facial information could have played a role in competence judgments, though the images used by Todorov et al. and Martin also contain other information that is linked to social attributions, such as clothing (Forsythe, 1990), expression (Kraut & Johnston, 1979), and head posture (Campbell, Wallace, & Benson, 1996).

The current study looked to expand on research on voting behavior based on physical traits to examine voting for faces based only on facial shape information (Study 1). Although it is likely that competence is important in almost all leadership decisions, it is possible that different faces signal different valued traits that may be more or less

important according to current circumstances. 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). Thus, we also examined the effects of context (time of war versus time of peace) on voting for different face shapes encompassing different perceived personalities and masculine and feminine traits. To examine the interaction between face shape and war/peace time context, we used a pair of manipulated faces based on politicians and faces manipulated for masculinity, which were proposed to show dominance versus prosocial traits, as such traits appear likely to have different worth under war and peace time conditions (Study 2).

## 2. Study 1

Here, we examine whether facial appearance could have influenced the voting in national elections using hypothetical voting based strictly on facial shapes. We examined nine pairs of leaders of winning and losing political parties in past elections from four different countries (Australia, New Zealand, the UK, and the USA) to examine the extent that simple physical stereotypes can influence important decisions. We defined the candidate whose party won most popular votes as the winner of each election, as this variable most likely reflects votes based on facial appearance (for details see Methods).

Todorov et al. (2005) controlled for familiarity by removing faces that would be readily recognized. Here, we remove recognition of the candidate as a factor in the judgments and limit judgments to facial information by computing the difference in shape between each pair of winners and losers and applying this to a neutral face image (Benson & Perrett, 1991; Tiddeman, Burt, & Perrett, 2001), creating face images that exaggerate the differences between the winner's and loser's shapes. The transformed images thus hold the shape and configuration of features that differentiate the two candidates' faces but do not contain specific cues to their identities, clothing, or emotion (see Fig. 2, Methods).

### 2.1. Methods

#### 2.1.1. Participants

One hundred ten individuals (58 female, 52 male, aged 18–85 years, mean=33.1, S.D.=13.5) made forced-choice decisions for the voting judgments. Our judges represented a selection of individuals who were staff and students at the University of Liverpool and other individuals assessed on the streets of Liverpool and were current UK residents.

#### 2.1.2. Stimuli

Eight pairs of face images were presented to participants. These were constructed from images of winners and losers

of the past two general elections in Britain (Tony Blair vs William Hague, Tony Blair vs John Major) and Australia (John Howard vs Mark Latham, John Howard vs Kim Beazley), and the past two presidential elections from the USA (George Bush vs John Kerry, George Bush vs Al Gore). We also included the 1999 New Zealand general election (Helen Clark vs Jenny Shipley), which represented the only pair of female faces, but discarded the 2002 general election (Helen Clark vs Bill English) as the two main leaders were of different sexes. In its stead, we added one more previous British election (John Major vs Neil Kinnock). Finally, we also created a ninth pair of faces, which represented images of the two main leaders in the

then forthcoming May 2005 UK general election—Tony Blair and Michael Howard.

As a base face, a composite of one male face (10 images, taken under standardized lighting and with a neutral expression) was transformed in shape using only the shape difference between a composite of each winner and a composite of each loser (four images each, Fig. 1 for examples; the same procedure was used with a female composite for the New Zealand 1999 election). Images were selected on the basis of quality and size based on a search of freely available internet sources. Composite images were used to ensure images were representative of the individual's average appearance. The use of a single base face

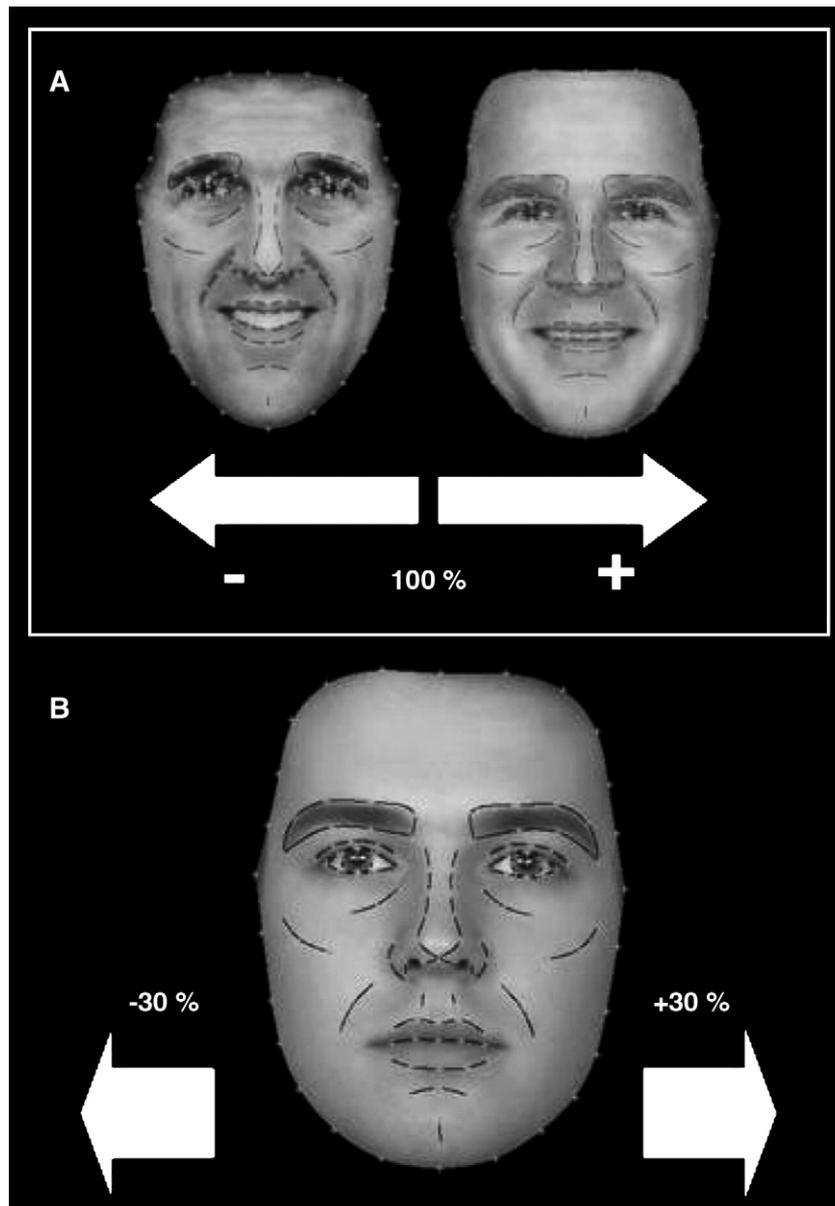


Fig. 1. Outline of transformation technique. The points marked (lines join the points) on the composite images of John Kerry and George Bush allow the calculation of the difference between their face shapes (A). These shape differences are applied to a new image, moving along this vector in either direction (B). Note that only shape information is changed and that the corners of the mouth were held constant in the transformed images minimizing the impact of a smile difference between the two original images.

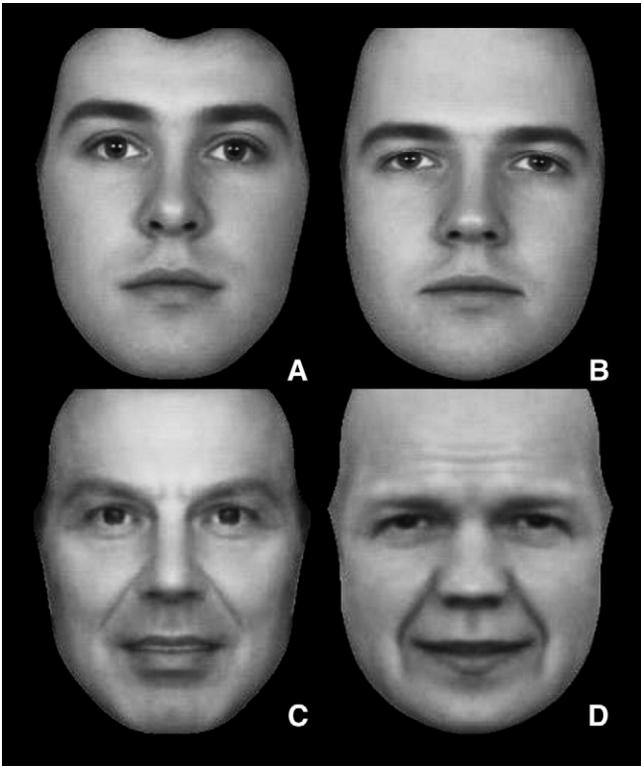


Fig. 2. Example pair of shape-only-transformed composites representing the difference between Tony Blair and William Hague (plus-Blair/anti-Hague [A], plus-Hague/anti-Blair [B]) and original composites of Blair (C) and Hague (D) used to make the transform.

meant that the individual transforms based on the difference between each winner and loser all had the same shape before transformation and identical facial coloration after transformation. Composites were made by marking a number of landmark features, calculating an average shape for each, and warping each constituent image to the average before blending the images together into a single image. All images were made symmetric prior to transform.

Transformations were based on 50% of the difference between each of the winner and loser composites (following methods for similar transformations of other traits: (Little & Hancock, 2002; Perrett et al., 1998)). Such a transform reflects mathematical computations based on the distances between the landmark points (Benson & Perrett, 1991) and objectively represents the distance in face space (Valentine, 1991) between the two individuals involved. We attempted to minimize smile differences in the transformed images by holding the corners of the mouth constant. The transformation process is outlined in Fig. 1, and example transforms are shown in Fig. 2. While only a single composite face is transformed here, we note that composite faces are representative of the average traits of the faces within them and do not appear significantly more average after around six faces (Little & Hancock, 2002). Idiosyncratic differences between real faces are not an issue here and thus our vectors should have the same effect on perception, on average,

across all faces. Transforming and composite creation used specially designed software [Perception Laboratory, University of St. Andrews; see Tiddeman et al. (2001)], and we thank D. I. Perrett and B. P. Tiddeman for use of their software.

### 2.1.3. Procedure

The face pairs were presented to individuals in Liverpool during March 2005, using four different image sets. Two sets presented faces in the same order but counterbalanced the side of presentation, while the other two sets presented face pairs in the reverse order while similarly counterbalancing side of presentation. Face pairs were presented with the question, “Please indicate which face you would vote for to run your country,” and participants were asked to select the left or right hand face. Participants were then asked their age and sex. All answers were noted by the experimenter.

### 2.1.4. Analysis

Electoral data were collated for each election and are summarized in Table 1. For each candidate, we recorded the percentage of the popular vote received by their party, and the number of seats won (for the US presidential elections we here use the number of electoral college votes). For Australia, we use first-preference votes rather than two-party preferred results, as these relate more directly to the candidates and their parties. For the same reason, we also used party-specific data where one of the leading parties stood as part of a preexisting coalition (i.e., we used data for John Howard’s Liberal Party of Australia rather than total data for the coalition with the National Party and the Country Liberal Party, and for Helen Clark’s Labour Party without data from the Alliance). For comparison with the “votes for faces” data, we then computed a two-way split of the popular vote and number of seats/electoral college votes between the two parties, as a percentage (Table 1). For purposes of comparison with our “face votes” data set (which is a form of “popular vote”) we define the winner as the leader of the party receiving the larger share of the popular vote in this two-way split. Note that Gore (USA 2000) and Beazley (Australia 2001) are winners under this definition even though they did not officially win their elections: Gore lost on the decisive Electoral College vote count, while Beazley similarly won fewer seats than Howard.

In the analyses, we used the winner’s percentage of the face votes, actual popular vote, and percent of seats won.

## 2.2. Results

We calculated the percentage of “votes” cast by each participant which were for eventual winners in the actual elections. Choice of face was analyzed with a one-sample *t* test against chance (50%), revealing that participants were more likely to “vote” for winning faces (57%) than losing faces (43%,  $t=4.0$ ,  $d.f.=109$ ,  $p<.001$ ).

To take into account the margin of victory, we correlated the percentage of votes cast for the winning face with two measures of performance in the actual election (Fig. 2). We found that the percentage share of votes cast for the winning face correlated positively with both the percentage share of popular votes (Spearman correlation,  $r_s=0.762$ ,  $p=.028$ ) and the share of seats/electoral college votes ( $r_s=0.714$ ,  $p=.047$ ) in the eight elections (Fig. 3).

Finally, we calculated linear regression equations based on these data in order to make a prediction concerning the May 2005 British general election (analysis was carried out in late March 2005). The regression models based on the eight previous elections were (1) predicted two-way split of popular vote= $40.95+0.224$  (% split in face vote) and (2) predicted two-way split in seats= $19.61+0.679$  (% split in face vote). The two models explained 47% and 51% of the variance, respectively [(1)  $F_{1,7}=5.30$ ,  $p=.061$ ; (2)  $F_{1,7}=6.27$ ,  $p=.046$ ]. Using a ninth pair of images, which represented the difference between the faces of the candidates Tony Blair and Michael Howard, we found that the overall “vote” for this pair was 54.54% in favor

of Blair. Feeding this percentage into the regression models, we found that the models predicted a win for Blair in terms of both popular vote (53.17%) and seats won (56.6%).

Our predictions were relatively accurate, as Blair won 52.13% of the actual two-way share of the popular vote and 64.3% of the split in seats won (<http://news.bbc.co.uk/1/shared/vote2005/html/scoreboard.stm>). Incorporating this result as a ninth data point in our regression models resulted in significant models for both the popular vote ( $r^2=.473$ ;  $F_{1,8}=6.28$ ,  $p=.041$ ) and the number of seats won ( $r^2=.452$ ;  $F_{1,8}=5.77$ ,  $p=.047$ ).

### 2.3. Discussion

Caricaturing along a winning-losing dimension revealed that facial characteristics of election winners and losers have different “votability.” We also show that the difference in “voting” between winners and losers is correlated with the share of both popular votes and seats won. Thus, as well as being associated qualitatively with winning and losing elections, the votes for faces predict the share of both measures.

Table 1  
Electoral data from eight general or presidential elections

Country	Date	Candidates	Party	Popular vote (%)	Seats/electoral college votes	Popular vote split (%)	Seat split (%)	Source
Australia	2001	Kim Beazley	Australian Labor Party	37.84	65	50.51	48.51	<a href="http://www.aec.gov.au">www.aec.gov.au</a>
		John Howard	Liberal Party of Australia	37.08	69	49.49	51.49	
	2004	John Howard	Liberal Party of Australia	40.47	74	51.81	55.22	<a href="http://www.aec.gov.au">www.aec.gov.au</a>
		Mark Latham	Australian Labor Party	37.64	60	48.19	44.78	
NZ	1999	Helen Clark	Labour Party	38.74	59	55.95	60.20	<a href="http://www.justice.govt.nz/pubs/reports/2000/election_e9_1999">www.justice.govt.nz/pubs/reports/2000/election_e9_1999</a>
		Jenny Shipley	National Party	30.50	39	44.05	39.80	
USA	2000	Al Gore	Democratic Party	48.38	266	50.26	49.53	<a href="http://www.fec.gov/pubrec/electionresults.shtml">www.fec.gov/pubrec/electionresults.shtml</a>
		GW Bush	Republican Party	47.87	271	49.74	50.47	
	2004	GW Bush	Republican Party	50.73	286	51.24	53.26	<a href="http://www.fec.gov/pubrec/electionresults.shtml">www.fec.gov/pubrec/electionresults.shtml</a>
		John Kerry	Democratic Party	48.27	251	48.76	46.74	
UK	1992	John Major	Conservative Party	41.93	336	54.94	55.35	<a href="http://www.election.demon.co.uk/ge1992.html">www.election.demon.co.uk/ge1992.html</a>
	1997	Neil Kinnock	Labour Party	34.39	271	45.06	44.65	<a href="http://www.election.demon.co.uk/ge1997.html">www.election.demon.co.uk/ge1997.html</a>
		Tony Blair	Labour Party	43.20	418	58.47	71.70	
	2001	John Major	Conservative Party	30.69	165	41.53	28.30	<a href="http://www.election.demon.co.uk/ge2001.html">www.election.demon.co.uk/ge2001.html</a>
		Tony Blair	Labour Party	40.68	412	56.20	71.28	
		William Hague	Conservative Party	31.70	166	43.80	28.72	

Winners (the first name given for each pair) here are defined by the party's share of the popular vote compared with that of the leading opposition party.

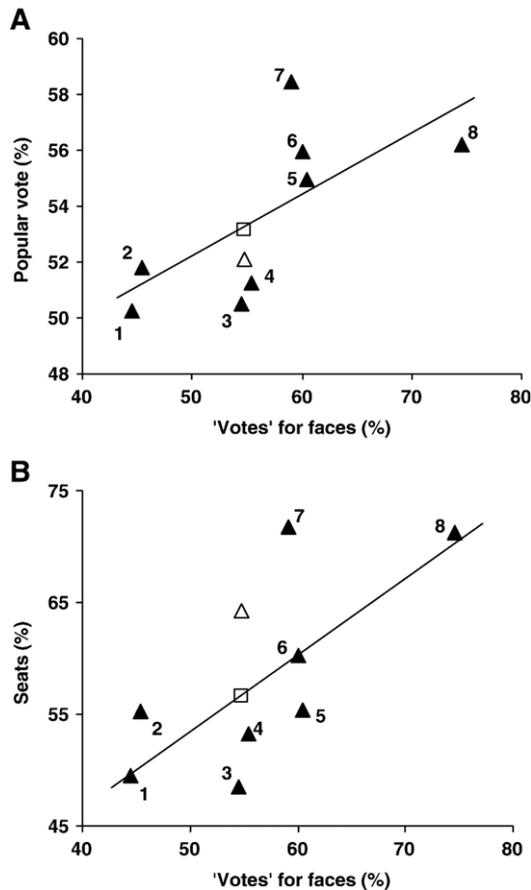


Fig. 3. Relationship between votes for face pairs and (A) popular votes and (B) proportion of seats/electoral college votes in national elections. In each case, data represent the percentages for the winner of the popular vote in the actual election (the first-named candidate in each pair) and the percentage of votes for the same candidate's facial representation. Closed triangles indicate the eight politician pairs used to build a predictive model for the 2005 UK election (Blair-Howard). The open square represents the predicted split in this election, the open triangle shows the actual outcome. 1, Gore-Bush; 2, Howard-Latham; 3, Beazley-Howard; 4, Bush-Kerry; 5, Major-Kinnock; 6, Clark-Shipley; 7, Blair-Major; 8, Blair-Hague.

As our transforms were based on the difference between two individuals and not a single individual's appearance, our results suggest that the shape differences between the winners' and losers' faces appear sufficient to account for a significant effect on voting decisions. Furthermore, the use of shape transforms suggests that, at least at a conscious level, the results are independent of candidate recognition and its corollary the potentially confounding influence of greater familiarity with incumbent candidates. While it remains possible that voters might subconsciously perceive familiar face shapes associated with familiar and, hence, successful politicians as more electable, this possibility is largely removed in our study both by use of shape *differences* and because the politicians came from a number of different countries and, thus, were of variable familiarity to our UK "voters." Exposure does increase feelings of liking, normality, attractiveness, and ratings of trustworthiness

(Buckingham et al., 2006; Little, DeBruine, & Jones, 2005; Zajonc, 1968), leaving the possibility open for familiarity with winning candidates, leading to increased likelihood of receiving votes, though the points outlined above coupled with the findings of Todorov et al. (2005), who remove the more famous candidates and use such a number of images that familiarity is unlikely to be an issue, all detract from familiarity being the key issue here.

Our results complement those of Todorov et al. (2005), who found that aspects of appearance predicted election outcome in US congressional elections (using samples from 2000, 2002, and 2004). We used fewer images but demonstrate that election outcome can be reliably predicted by facial shape alone and that this effect is present in the

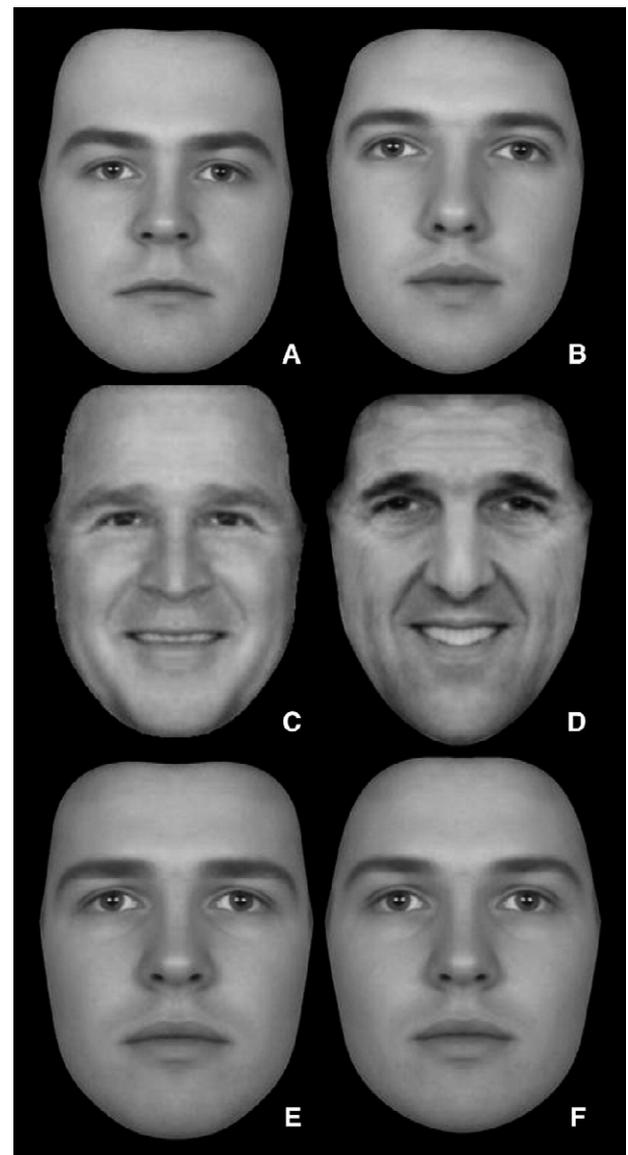


Fig. 4. Transformed composites representing transforms of Bush vs. Kerry (plus-Bush/anti-Kerry [A], plus-Kerry/anti-Bush [B]), original composites of Bush (C) and Kerry (D) used to make the transform, and masculinized (E) and feminized (F) faces.

highest level of elections and across national electoral systems. While Todorov et al. find competence judgments to be predictive, they also demonstrate that competence ratings correlate .86 with hypothetical voting and that hypothetical voting on appearance also predicts winners and losers, meaning our ratings are comparable as a simple vote captures what individuals desire in their leaders.

### 3. Study 2

Here, we examine attributions of attractiveness, dominance and personality, as well as hypothetical voting in different contexts based on the facial shapes of George Bush and John Kerry. We used these faces because these prominent individuals publicly argued over their suitability to lead in a time of war during their election campaigns, and preliminary data suggested a difference in perceived masculinity between their two faces. Following the methods of Study 1, the difference in shape between Bush's and Kerry's face was applied to a neutral face image (Tiddeman et al., 2001), creating a face exaggerating Bush's shape as it differs from Kerry's and a face exaggerating Kerry's shape as it differs from Bush's (Fig. 4, Methods). The transformed images thus held the features and configuration of features that differentiate the two candidates' faces but did not contain specific cues to their identities. Facial masculinity, because of its link to dominance, was also examined in terms of voting for leaders. In contrast to previous studies described above, our stimuli control for extraneous factors such as clothing and expression, restricting any influence on voter perception to differences in facial shape only.

We asked two groups of participants to make forced-choice decisions for either physical and personality judgments or hypothetical voting for the Bush/Kerry images. Previous studies have shown that masculinity in faces is associated with personality attributions: masculine faces are seen as more masculine and dominant but less cooperative and less attractive than feminine faces (Perrett et al., 1998), and so we examined only voting to masculine/feminine faces.

#### 3.1. Methods

##### 3.1.1. Participants

Fifty-seven individuals (45 female, 12 male, aged 18–41 years, mean=21.7, S.D.=4.6) made forced-choice decisions for the physical and personality judgments. One hundred one different individuals (69 female, 32 male, aged 18–30 years, mean=21.0, S.D.=2.3) made forced-choice decisions for the voting judgments. Data were collected in October 2004 prior to the US election. A third sample of 91 individuals (44 female, 47 male, aged 18–40 years, mean=21.8, S.D.=3.9) made forced-choice decisions for the voting judgments for the masculine/feminine faces. Participants were University of Liverpool students and were current UK residents.

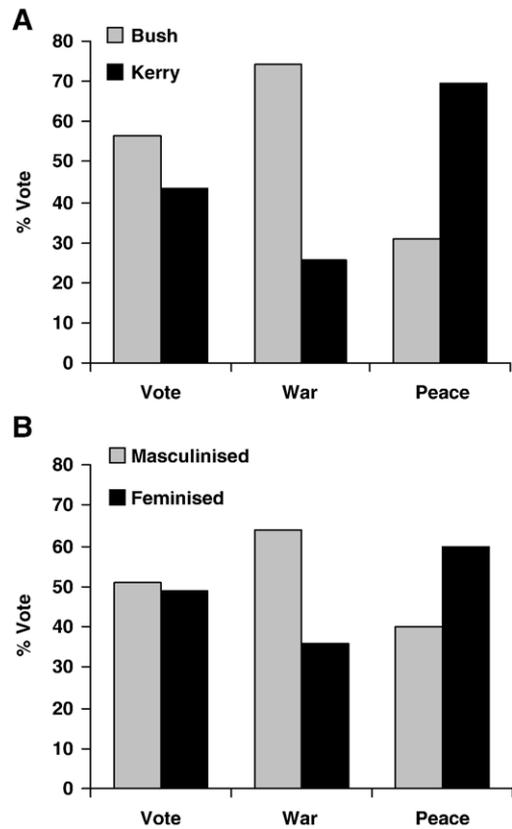


Fig. 5. Proportion of votes for plus-Bush and plus-Kerry (A) and masculine and feminine (B) transformations by scenario.

##### 3.1.2. Stimuli

Two face images were presented to participants for judgments of Bush vs. Kerry (Fig. 4). These images were constructed in the same way as in Study 1. A single composite of a young male (10 images, taken under standardized lighting and with a neutral expression) was transformed in shape only using the linear difference between a composite of George Bush and a composite of John Kerry (5 images each, Fig. 4). Transformations were again based on 50% of the difference between the Bush and Kerry composites. For masculine/feminine faces, the same base face as used above was transformed using the linear difference between a symmetric composite of 50 young adults males and a symmetric composite of 50 females (following the technique reported in Perrett et al., 1998). Transforms represented 50% ± the difference between these two composites, creating the masculine and feminine images.

##### 3.1.3. Procedure

Participants filled in a short questionnaire assessing their age and sex. The face pairs were then presented via a Java Applet, which randomized the side on which the images were presented. On each trial clicking a button below the image indicated the rater's choice based on a particular trait and moved the program onto the next trial. Participants made seven physical and personality judgments in response

to the on-screen prompt, “Please indicate which face you think looks most X by clicking below,” where X was replaced by adjectives offered in the following order: attractive, masculine, dominant, strong leader, likable, forgiving, intelligent. The second and third set of participants “voted” in response to the on-screen prompt, “Please indicate which face you would vote for to run your country” and then twice more in response to the same question followed by “in a time of war” or “in a time of peace” for either the Bush/Kerry or masculine/feminine faces.

### 3.2. Results

Choice of face was analyzed with one-way chi square tests ( $d.f.=1$ ), as the data for each participant was categorical. The “plus-Bush” (anti-Kerry) face was seen as more masculine (65%/35%,  $\chi^2=5.1$ ,  $p=.024$ ) and dominant (63%/37%,  $\chi^2=3.9$ ,  $p=.047$ ) than the “plus-Kerry” (anti-Bush) face, while the plus-Kerry face was seen as more attractive (79%/21%,  $\chi^2=19.1$ ,  $p<.001$ ), forgiving (82%/18%,  $\chi^2=24.0$ ,  $p<.001$ ), likable (75%/25%,  $\chi^2=14.8$ ,  $p=.024$ ), and intelligent (67%/33%,  $\chi^2=6.3$ ,  $p=.012$ ) than the plus-Bush face. The plus-Bush face was selected by more individuals as a strong leader (58%/42%,  $\chi^2=1.4$ ,  $p=.23$ ), though this was not significant. Age was not correlated with any of the choices (all  $p>.27$ ) and independent samples  $t$  tests revealed no difference between male and female raters for the scores (all  $p>.18$ ).

The plus-Bush face was selected by more individuals as the face they would vote for to run their country (56%/44%,  $\chi^2=1.7$ ,  $p=.20$ ) than the plus-Kerry face. While not significant here, such trends could help win elections if they hold for real voting. The faces were differently voted for according to war- or peace-time leadership. The plus-Bush face was “voted” for most when voting in a time of war (74%/26%,  $\chi^2=23.8$ ,  $p<.001$ ) and the plus-Kerry face was voted for most when voting in a time of peace (61%/39%,  $\chi^2=15.1$ ,  $p<.001$ , Fig. 5). Age was not correlated with any of the voting choices (all  $p>.43$ ), and independent samples  $t$  tests revealed no difference between male and female raters for voting scores (all  $p>.41$ ).

Voting for the masculine versus feminine face revealed that there was no significant difference when individuals were asked to vote for an individual to run their country (51%/49%,  $\chi^2=0.1$ ,  $p=.92$ ). The faces were, like the Bush/Kerry faces, differently voted for according to war- or peace-time leadership. The masculine face was “voted” for most when voting in a time of war (64%/36%,  $\chi^2=6.9$ ,  $p=.003$ ), and the feminine face was voted for most when voting in a time of peace (60%/40%,  $\chi^2=4.0$ ,  $p=.046$ , Fig. 5). Age was not correlated with any of the voting choices (all  $p>.42$ ) and independent samples  $t$  tests revealed no difference between male and female raters for voting scores (all  $p>.13$ ).

### 3.3. Discussion

Study 2 revealed that caricaturing a face along a Bush-Kerry dimension created different perceptions in terms of

physical appearance, personality, and hypothetical voting behavior. The faces of the two appear well matched when it comes to a general vote and this may reflect that Bush’s and Kerry’s faces each hold different aspects that would be valued in a leader—dominance for Bush and likeability/intelligence for Kerry. The different perceived physical and personality traits may be related, and potentially it is the overall perception of suites of traits that drive differential voting behavior rather than any single trait. Attractiveness cannot be the sole determinant of perceived leadership ability in these faces as the plus-Bush face was more likely to be voted for in a time of war despite being judged of lower attractiveness (it also received a higher percentage choice in a straight vote, though not significantly). Although we acknowledge that voting decisions are dependent on many other factors than the candidates’ faces, the findings are also surprisingly consistent with the outcome of the real voting in the 2004 election. The final polling revealed, from a 99% return for the two candidates, that Bush had 51% and Kerry had 48% of votes, very similar to the 56%/44% split here when judges were asked which face they would vote for as the leader of their country. This result is again in line with Todorov et al. (2005), who show a link between hypothetical votes to images and real voting.

The association between perceived dominance and masculine faces (Perrett et al., 1998) is somewhat similar to the association of masculinity and dominance and the plus-Bush face. Likewise, the prosocial perceptions of feminine faces resemble the feminine and prosocial attributions to the plus-Kerry face. Potentially, it is the masculine/dominant vs. feminine/prosocial difference between Bush and Kerry’s face shape that mean masculinized faces are voted for in the same way as the Bush face and feminized faces voted for in the same way as the Kerry face in the different voting contexts. While neither masculinity nor femininity was favored in a straightforward vote, the masculine face was voted for more in the war-time context and the feminine face was voted for more in the peacetime context.

Our results then show that judges have conditional values for the faces of leaders, which vary with current circumstances: the dominant features of Bush and masculine faces were favored in a leader during “war time,” while the more forgiving features of Kerry and feminine faces were favored in a leader in “peace time.” Preferring a likable, forgiving leader may be expected because traits such as altruism, trust, and modesty are generally valued characteristics in others (Hampson, Goldberg, & John, 1987). In a time of peace, these prosocial attributes may be more beneficial to the group or society and, so, are of increased value in a leader. However, these same features may not be favored in a time of war, as the possessor may be perceived as being more likely to lose out to more aggressive competitors (Kyl-Heku & Buss, 1996). In the context of leadership during a time of war, dominant masculine features may signal that the individual may be better able to stand up for and protect

the group or society. Facultative choice of leader according to who may be most useful for a particular situation or context may reflect an adaptation within human social groups, which could potentially benefit the other individuals in a group.

#### 4. General discussion

Our results provide strong evidence that facial appearance has important effects on choice of leader. We have shown that differences in facial shape alone between candidates can predict who wins or loses in an election (Study 1) and that changing context from war time to peace time can change the type of face that is voted for (Study 2).

We acknowledge that voting decisions are dependent on many other factors 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, Milne, & Bodenhausen, 1994), attributions to faces may be another way of voters discriminating between candidates when presented with an overload of information. Our results are a further demonstration that, even for decisions ostensibly based on objective and critical evaluation of a variety of information, we may in fact be influenced by relatively simple unconscious stereotypical processes.

The change in voting for facial shapes according to war or peace context (Study 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 political climate that we vary here, and select the best candidate accordingly. Interestingly, our results suggest the potential for candidates for leadership positions to promote themselves as a good leader and, thus, win votes by influencing or manipulating their group's/electorate's perception of the current climate or situation in such a way as to be consistent with the particular strengths associated with their facial characteristics and other aspects of their physical appearance. 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 of use in ancestral environments. Individuals appear to not consider aspects of large-scale technology-driven warfare and make the best choice for small-scale intergroup conflict.

Relating to hormones and behavior, as masculine face shape is related to current levels of testosterone (Penton-Voak & Chen, 2004) and markers of prenatal testosterone (Fink et al., 2005), masculinity of face shape may be source

of accurate information available during decisions. Judges may then use face shape to accurately assess the testosterone, and thus any associated behavior, when making decisions about their leaders; this may be of different value in different conditions. More generally, people do believe the face provides important guides to character (Hassin & Trope, 2000; Liggett, 1974) and there are also studies showing that observers can make reliable and somewhat accurate judgements of others' personality traits on the basis of very little information, traits like extraversion and conscientiousness (Albright et al., 1998; Passini & Norman, 1966; see Kenny et al., 1994, for review). Such evidence for a 'kernel of truth' in judgements made based on appearance and the belief that faces do provide valid guides to character may help explain the importance of facial appearance in decisions such as leader choice.

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